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Welcome to this issue of the ***Business Education Innovation Journal***.

The purpose of this journal is to assemble researched and documented ideas that help drive successful learning and motivate business students to learn. The intention is to draw ideas from across both methods and disciplines and to create a refereed body of knowledge on innovation in business education. As a result, the primary audience includes business education faculty, curriculum directors, and practitioners who are dedicated to providing effective and exciting education.

We invite you to read about innovations published and apply in your classroom. We also encourage you to develop your original creative ideas, prepare an article, and submit for review.

This particular issue includes a number of interesting classroom innovations in diverse areas.

Peter J. Billington, *Editor*

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Preparing Students for the AI-Driven Future: Generative AI in Fashion and Marketing Education

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ABSTRACT

This study explores the integration of Generative AI (GAI) into fashion and marketing education by redesigning traditional projects into GAI-driven applications, including promotional content creation, trend analysis, and store layout design. Implemented across **three redesigned courses—Consumer Behavior, Visual Merchandising, and Fashion Licensing—during Spring 2024**, this initiative involved collaboration among faculty members to align classroom objectives with evolving industry demands. **A qualitative analysis of student outputs and reflections** was conducted to assess learning outcomes and instructional implications. While GAI enhanced creativity and efficiency, challenges related to ethical concerns, inconsistent visuals, and design inaccuracies limited its effectiveness. The findings underscore the need for **structured instructional strategies, iterative refinement, and continuous adaptation** to refine GAI-based educational frameworks and guide future curriculum innovations.

Keywords: generative AI, educational technology, fashion and marketing education, AI-integrated projects, curriculum innovation

INTRODUCTION

Since the release of ChatGPT in November 2022, Generative AI (GAI) technology, as one of the first conversational AI tools widely accessible to non-technical users, has been innovating industries by transforming workflows, enhancing decision-making, and streamlining tasks. According to a recent report (Dutt et al., 2024), approximately 62% of business leaders are excited about GAI, with 79% believing it will reshape their industries. Specifically, the adoption rates of GAI are substantial, with marketing, sales, and customer service at 41%, and supply chain and manufacturing at 29%. GAI drives increasing efficiency in operations, reducing costs, and improving customer relationships.

In the fashion industry, GAI has transformed the landscape by enabling better-selling designs, reducing marketing costs, personalizing customer communications, and accelerating processes. It has revolutionized supply chain logistics, store operations, and support functions. According to Harreis et al. (2023), GAI can empower designers to analyze real-time social media and consumer data, improving trend forecasting and generating diverse, customer-tailored designs. It facilitates customized products and exclusive collaborations, enhancing brand appeal. In marketing, GAI can streamline personalized emails, social media campaigns, and viral content, boosting efficiency and engagement. For sales, it enhances virtual try-ons, product recommendations, and multilingual chatbots, improving satisfaction and efficiency. In supply chain and manufacturing, GAI can optimize warehouse operations and real-time inventory management, reducing inefficiencies (Harreis et al., 2023).

With this recent GAI adoption in the industry, academia is also transforming under its influence, sparking differing views among educators. Some advocate limiting GAI use in classrooms due to concerns like academic integrity, misuse, bias, and privacy risks. However, this restrictive approach risks leaving students unprepared for AI-driven careers and could create inequalities as students use these tools on their own (Chen et al., 2023; Heo & Lee, 2019). Others highlight GAI's benefits, such as improving accessibility and preparing students for real-world tasks. Guha et al. (2023) suggest using GAI in assignments that mirror industry applications, enabling students to focus on complex tasks while fostering critical thinking and creativity.

Despite its potential, integrating GAI into curricula poses challenges due to the lack of resources for its application in higher education and the lack of guidelines for its ethical use in college settings. First, redesigning coursework requires considerable effort from educators, many of whom may lack the necessary training, resources, or technical expertise to redesign their curriculum. Also, ethical use and evaluation add complexity, as GAI blurs the line between human and AI creativity. While frameworks, such as AI literacy (Kong et al, 2021; Long & Magerko, 2020; Ng et al., 2021) and the AI TPACK model (Celik, 2023; Ning et al., 2024), have been extensively explored, practical guidance for

classroom integration remains limited, emphasizing the need for further research. Educators face rapid technological updates to GAI tools, unclear strategies, and unpredictable learning outcomes, which make the integration of GAI a challenging task. While creating a perfect GAI-integrated curriculum that addresses all concerns may be unrealistic, educators must make continuous efforts to integrate GAI into traditional courses. This process should involve collective learning through shared experiences, lessons learned, and educational strategies to address challenges during implementation, paving the way for more effective integration.

This paper shares insights from incorporating GAI-integrated lessons into fashion and marketing courses. Objectives include: (1) showcasing the transformation of traditional lessons into GAI-integrated projects in two fashion and one marketing course, focusing on applications like promotional content creation, store layouts, and trend analysis; and (2) examining the benefits and challenges based on observed outcomes. The analysis provides lessons from early GAI integration, offering a foundation for refining educational strategies. The overarching aim of this study is to explore how Generative AI can be effectively integrated into applied courses in marketing and fashion to balance creativity, ethical considerations, and technical skill development.

PREVIOUS STUDIES

Existing pedagogical studies on AI in the education field have focused on the following: AI literacy, AI integration-related framework, student engagement, and the ethical challenges associated with these technologies. AI literacy studies explored on equipping students and educators with foundational knowledge about AI technology and its implications. For instance, Long and Magerko (2020) identified key competencies and design considerations to support the effective use of AI and proposed a framework to guide its application in design from a learner-centered approach and offer educational strategies. Others also conducted exploratory studies to propose a theoretical foundation to define AI, teach skills to use AI, and evaluate students' AI literacy. They also shared insights on designing, implementing, and evaluating a course to increase the level of understanding of AI tools for university students (Kong et al., 2021; Ng et al., 2021). These studies emphasized the importance of integrating AI literacy into educational curricula to facilitate student engagement with AI.

Another research stream focuses on frameworks supporting educators in integrating AI into teaching practices. Researchers (Celik, 2023; Ning et al., 2024) presented the AI-TPACK framework, emphasizing the integration of technological, pedagogical, and content knowledge to facilitate effective AI adoption in classrooms. Crittenden et al. (2019) proposed an Enhance Learning Model that prioritizes exposure to evolving technologies and human-centric skills over traditional knowledge-focused approaches, emphasizing integrative learning and digital engagement to prepare students for a technology-driven future. Alqahtani and Wafula (2024) examined how 25 leading universities develop pedagogical strategies and policies for integrating AI in education. Their findings revealed diverse strategies, ranging from embracing AI tools for teaching efficiency and student engagement to addressing ethical concerns such as academic integrity and data privacy.

AI has also been studied in the education field focusing on student engagement and inclusivity. Some have explored the use of AI as student assistants to provide real-time feedback and personalized support and improve motivation and learning outcomes (Chen et al., 2023). Others have examined chatbot services as a way to address language barriers for international students and to enhance inclusivity (Heo & Lee, 2019). Moreover, while some researchers have studied the adoption of chatbot by identifying factors (i.e., perceived convenience and improved performance) influencing the adoption in the education field (Malik et al., 2021), others have pinpointed opportunities and challenges associated with chatbots and suggested the need for more advanced and varied applications for enhanced educational outcomes (Hwang & Chang, 2023).

The integration of AI in education also presents challenges related to ethical concerns and pedagogical implementation. Previous researchers suggested a gap in aligning AI technologies with existing pedagogical knowledge (Dantas et al., 2022). Regarding the ethical concerns, researchers have analyzed global AI ethics guidelines and suggested ethical principles such as transparency, justice and fairness, non-maleficence, responsibility, and privacy (Jobin et al., 2019). Others also emphasized the importance of institutional policies in mitigating these risks related to biases and ethical dilemmas, particularly in the use of AI (Alqahtani & Wafula, 2024).

Generative AI technologies, such as ChatGPT and AI-based image creators, have introduced the role of AI as a game changer in education. Recent studies have focused on the potential of AI to redefine traditional pedagogical approaches while addressing ethical and practical challenges. Guha et al. (2023) argued that integrating generative AI tools into

marketing education could significantly enhance learning experiences and better prepare students for industry practices while also emphasizing the importance of addressing associated risks such as ethical considerations and data privacy. Al-kfairy et al. (2024) explored the ethical challenges of generative AI, highlighting issues such as privacy, misinformation, bias, and societal inequalities, while advocating for proactive, multidisciplinary approaches to ensure AI development aligns with fairness, transparency, and societal values. Zhai (2024) examined the transformative impact of GAI on education, proposing a framework categorizing teachers into roles—Observer, Adopter, Collaborator, and Innovator—based on their engagement with GAI, and emphasized the need for teacher education, professional development, and institutional support to enable effective integration of GAI into pedagogical practices.

While these studies offered valuable insights into the applications and challenges of GAI in education, there is limited research on its practical implementation in curricula development. Pavlik and Pavlik (2024) highlighted GAI's role in art education, showing how image-creator tools supported constructivist learning and visualization automation. However, a significant gap remains in providing educators with actionable strategies for integrating GAI tools, such as ChatGPT and AI image generators, into lesson plans and projects to enhance student learning. Such guidance moves beyond theory, equipping educators with adaptable practices for application in business and fashion courses. Overall, while these studies show broad opportunities and risks of GAI, little empirical work examines its integration into fashion and marketing education. This paper addresses that gap.

INTEGRATING GENERATIVE AI INTO FASHION AND MARKETING EDUCATION

This study explores integrating GAI and AI image generators into marketing and fashion courses by redesigning traditional projects for applications like promotional content, store layouts, trend analysis, and idea generation. Implemented in Spring 2024, the effort involved one Marketing and two Fashion faculty members who collaborated to integrate GAI into three courses: Consumer Behavior, Visual Merchandising, and Fashion Licensing. Previously non-GAI projects were transformed to evaluate student outcomes and address implementation challenges, laying the groundwork for future refinements.

Marketing Strategy Project in Consumer Behavior

GAI-Enhanced consumer Behavior Project

The initial group project involved marketing analysis, strategy development, and product positioning to design a backpack tailored to consumer needs using Maslow's Hierarchy of Needs. Students chose a target consumer profile, conducted competitive analysis to identify market gaps, and developed product strategies defining design, attributes, and benefits. Pricing strategies were based on perceived value, while channel and promotional strategies focused on distribution and creating a consumer-specific promotional mix. The project was redesigned to integrate GAI tools into market research, brand positioning, and promotional material development. Most students, unfamiliar with GAI tools, particularly AI image generators, participated in a workshop session to explore platforms like DALL-E, Adobe Firefly, Canva AI, and Bing Image Creator for creating ads or infographics.

Students chose one of three profiles: a recent graduate balancing work and fitness, a businesswoman managing work and family, or a child with special needs. These profiles challenged students to address unique needs and lifestyles unfamiliar to them. They identified functional attributes and user experiences, then created a brand name, logo, and tagline reflecting the backpack's value proposition. Tools like ChatGPT were leveraged to refine functionality, while AI image creators were used to design brand logos, infographics, and visuals showcasing features, benefits, and usage scenarios.

Evaluating Outcomes and Student Engagement with GAI

The project concluded with an oral presentation summarizing marketing strategies and showcasing promotional content designed to enhance customer understanding and engagement. Students reflected on their experiences with GAI tools, discussing prompts, challenges, tool comparisons, and the tools' effectiveness in achieving their goals.

The project was assessed comprehensively across consumer analysis, competition analysis, marketing strategies, promotional materials, and communication skills. Consumer analysis evaluated understanding of marketing principles, while competition analysis assessed differentiation. Marketing strategies were judged on originality and comprehensiveness, and promotional materials were reviewed for creativity and course concept integration. Communication skills were assessed for clarity, professionalism, and effective visual aid use. Reflections on GAI tools were evaluated for insight depth, critical evaluation, and problem-solving.

Without GAI, students often presented descriptive promotional content or basic hand-drawn visuals. With GAI, outcomes improved significantly, enabling students to create polished promotional materials like logos, ads, and infographics. GAI integration enhanced creativity, provided practical tool experience, and elevated the professionalism of their work.

Challenges in GAI Application

Students identified several challenges in using AI-driven image generators. Crafting prompts to generate product images that aligned with their envisioned designs often required multiple iterations. While the results were somewhat satisfactory, they rarely achieved the exact image students had in mind. Additionally, students faced challenges in generating multiple infographics with consistent product images for enhanced product visuals, real-life usage scenarios, and callout infographics. Each time they generated images, the AI produced variations instead of maintaining consistency, and brand logos were often inaccurately integrated into the designs. Generating product variations, such as different colors or sizes, was also problematic due to these limitations.

Students who used Canva AI and Adobe Firefly reported more realistic outputs compared to those using DALL-E or Bing Image Creator. However, creating callout infographics, which required labeling specific features and benefits, often necessitated additional tools like Adobe Photoshop or Microsoft PowerPoint. Overall, students felt that current AI image generators lacked the capability to accurately depict their intended designs or reference the same product consistently across multiple images, limiting their practical use for generating real promotional materials.

From the teachers' perspective, encouraging students to engage in multiple iterations of GAI interaction is essential to refine images closer to their desired outcomes, as some groups demonstrated a lack of effort in refining their results through repeated iterations. There were also concerns about students' collaboration with GAI for market analysis and strategy development. Some groups appeared to passively accept AI-generated content—often broad and general suggestions—without critically evaluating the outputs against their initial ideas or the specific context of their project.

Improving Project Implementation

Implementing structured preliminary work sessions can be useful to enhance student engagement with GAI tools in future semesters. These sessions could focus on systematic approaches to crafting effective prompts, emphasizing elements such as context, narrative development, and feedback loops. Providing examples of successful GAI use and offering feedback on initial attempts can further aid students in refining their inputs to achieve desired outcomes. Engaging in activities that require identifying, critiquing, and adapting AI-generated strategies related to various marketing principles and concepts can foster a more critical and engaged approach to using these tools effectively. During the actual project implementation, students can be encouraged to compare AI-generated suggestions with their own ideas and research findings. This practice enables them to refine content, critically analyze AI-generated outputs, and actively enhance their learning experience.

Students have encountered challenges with AI-driven image generators, including difficulties in crafting prompts to achieve envisioned designs, inconsistencies across multiple images, and issues with accurately integrating brand logos. As GAI tools rapidly evolve, it would be crucial for educators to stay informed about advancements that improve consistency and control over design elements to integrate them into the classroom. Additionally, many updated features require paid plans, which can pose challenges for classroom use. Securing funding and resources at the university or school level would be essential to provide equitable access to these tools for students.

Store Plan Project in Visual Merchandising

GAI-Driven Store Layout Design

Students were assigned to develop a business plan based on their chosen fashion categories. This plan included a consumer profile, a business mission, and details about the location of a physical store. Building on this foundation, students created a store layout, wall display planogram, and exterior design images. The goal of the project was to apply visual merchandising strategies to create a comprehensive store plan.

As a group project, each team established a fictional business based on their market research and target consumer profile. Considering their selected target customers and business concept, the project unfolded in several stages. Each group conceptualized the physical appearance of their store, including both exterior and interior design, by generating images using AI tools of their choice to convey the overall look and feel of the store through visuals. They then created

a store floor layout plan that incorporated key elements such as selling fixtures (e.g., wall and floor fixtures), perimeter walls, a check-out area, back-office space, fitting rooms, and window display areas, aligning the layout with their brand image and concept. Students used AI image generators to produce 3D images of their store design to complement their 2D-floor layout drawings.

In addition to the layout, groups developed a planogram for one of the primary wall spaces within the store to showcase how products would be displayed, considering display strategies such as end-use, fabrics, styles, and colors. They also created store signage that included sign copy, graphics, and merchandise information with pricing details. Lighting plans were added to the existing store layout to enhance the overall atmosphere and design.

At every stage, students were encouraged to utilize GAI tools to generate images and visual elements, as well as tools like Photoshop or Illustrator to refine and customize their designs in alignment with their creative vision. Group discussions were required as a preliminary step to generate and refine creative ideas collaboratively.

Outcomes and Evaluation of the Project

The outcome of the group project was presented at the end of the semester and included a store exterior and interior plan, a layout plan with a visualized 3D store image, a wall planogram, promotional signage, and lighting plans. The main criteria for assessing the project were creativity, alignment with the intended brand concept, attention to detail, and feasibility. Specifically, each group's final plan was evaluated based on several factors. First, each component was assessed for its alignment with the brand image and store concept. Second, the visualized plan was evaluated on how well it met the needs of the brand's target customers. Third, the evaluation considered how each group had maintained originality and creativity while utilizing AI tools. Fourth, the outcome was assessed based on how the initial AI-generated results were tailored and modified to reflect each group's unique ideas. Finally, an oral explanation of the process used to generate the visualized store image with GAI was also evaluated.

Addressing GAI Usage Gaps & Challenges

Several gaps and challenges emerged between the instructor's expectations and the actual student use of GAI tools. While the instructor aimed to foster active engagement, stimulate curiosity, and incorporate new technology into the project, some groups tended to use GAI passively, focusing solely on completing the assignment. The intended purpose of using GAI was to assist students in brainstorming and refining their layout, wall planogram, signage, and exterior plans. The goal was to introduce students to new tools, encouraging curiosity and engagement to create thoughtful and well-developed concepts. However, some students used the AI image generator once or twice, leaving the generated images largely unmodified without addressing the details necessary to present their intended ideas.

For instance, layouts often lacked proper scale and detail, and the placement of fixtures was inadequately explained. Wall planograms sometimes contained errors, such as random items placed on mannequins without heads in an apparel display, or irrelevant products being displayed, which were left uncorrected. Similarly, exterior images were often submitted as final outcomes without revisions to align them more closely with students' ideas. Some groups used a single prompt to generate an exterior image and submitted it without further refinement, which hindered the quality of the outcome and failed to meet the assessment criteria.

While feasibility was a key criterion, some of the final outcomes included unrealistic props and fixtures generated by GAI, without replacement by practical alternatives. In terms of originality and creativity, several AI-generated images resembled existing store designs, with limited incorporation of students' unique ideas or store concepts. On the other hand, some groups chose to skip using GAI tools and instead used Photoshop or Illustrator to develop their final visuals. Although this method addressed originality issues, the quality of the resulting images was often not as high as that of AI-generated visuals.

In summary, a significant gap arose from students' lack of active engagement with the tools, particularly in refining AI-generated images to produce detailed and feasible plans. This limited the extent to which their final outcomes aligned with the intended goals of the project.

Improving Tools and Instructional Design

Future directions could involve providing clear guidelines on refining AI-generated images, conducting multiple feedback sessions, and dedicating time to discuss the prompts students used, as well as exploring additional prompts to achieve more tailored results. Encouraging students to remain focused on their intended ideas when making design

decisions will help them utilize GAI more effectively. These steps aim to enhance students' ability to use AI technology to clearly and effectively express their intended ideas in their final outputs.

In addition to refining the use of GAI tools, incorporating traditional visual software such as Photoshop or Illustrator into the workflow could further enhance the quality of the results. Instructions on how to integrate these tools with GAI outcomes could be provided, guiding students on refining proportions, adding intricate details, and aligning visuals with their intended design concepts. By combining the strengths of GAI with the flexibility of traditional software, students could achieve more polished and personalized outcomes. This approach also helps students improve their technical skills by combining design software and AI technology, ensuring they can adapt to new tools and create polished results.

Fashion Brand Extension Project in Fashion Licensing

Fashion licensing is a creative and strategic field that requires a deep understanding of market trends, consumer behavior and brand positioning. By leveraging AI technology, students were able to gather valuable insights and make data-driven decisions in a team project. Students were asked to use AI tools such as copilot or ChatGPT and AI image generator to analyze and identify potential opportunities for fashion brand extensions. Specifically, they were tasked to identify at least three potential product categories or collaborations that the fashion brand could expand into based on AI-driven analysis. Provide detailed explanations for each suggestion, including rationale, target audience, and potential benefits. The assignment was evaluated on the following criteria: depth of analysis and insight demonstrated in using GAI technology; creativity and originality in identifying brand extension opportunities; clarity and coherence of the strategic recommendations; quality of presentation and visual representation of data. Overall, this project challenged students to think critically, innovate and be creative using GAI tools to apply towards fashion licensing.

Outcomes and Evaluation of the Project

Students used GAI tools to analyze the market trends and consumer behavior. They successfully identified three potential product categories and collaborations for fashion brand extensions, supported by data driven insights. Some students were able to give strategic recommendations showcasing creativity and originality in their approach. The presentations were somewhat visually appealing but not coherent, students did not demonstrate a thorough understanding of use of GAI technology and its applications in fashion licensing. The recommendations were well defined, however did not provide a clear path for fashion brand expansion into new categories or collaborations. Overall, the project successfully challenged students to think critically and innovatively, focusing on their ability to use AI tools for strategic decision making in fashion licensing.

Gaps & Challenges

Some of the gaps that were observed include the interpretation of GAI generated insights and ensuring their relevance and accuracy in the context of fashion licensing. Another challenge for students was evaluating the potential benefits and risks of each brand extension opportunity since it requires a thorough understanding and analysis of market dynamics. Additionally, students found it challenging to generate accurate brand images or creative logos using GAI tools. The designs lacked uniqueness and visually appealing brand identities. While GAI can be used to automate certain design processes and provide ideas or templates, it may not always capture the essence or personality of a brand in the same way a human designer can. Design is a complex and subjective process that often requires human insight and understanding to create something truly impactful. Overall, students faced challenges in utilizing GAI tools effectively, resulting in superficial analysis and limited insights.

Modification plan

Educators need to introduce a comprehensive training session on GAI tools such as copilot, ChatGPT and AI image generators to familiarize students with their functionality and applications. Provide hands-on workshops and case studies that demonstrates practical use of GAI in analyzing market trends, consumer behavior and related concepts, helping students develop proficiency and confidence in utilizing GAI driven analysis.

Comparative Insights Across the Three Courses

Across the three redesigned courses—Consumer Behavior, Visual Merchandising, and Fashion Licensing—GAI enhanced creativity, engagement, and the professional quality of student work, though its use varied by discipline. Marketing students applied GAI for strategic storytelling and promotional content, fashion merchandising students focused on spatial visualization and aesthetic design, and licensing students used it for analytical exploration of

brand extensions. Common challenges included prompt refinement, visual inconsistency, and overreliance on AI-generated ideas. Together, these findings suggest that while GAI offers shared pedagogical benefits, its effective use requires discipline-specific guidance, iterative refinement, and critical evaluation skills.

CONCLUSIONS AND IMPLICATIONS

The study explored AI-incorporated projects implemented in three different courses within the business school, focusing on consumer marketing, visual merchandising, and brand extensions. Each project was detailed in terms of how the existing assignment was modified to encourage students to learn GAI tools, the tangible outcomes, the results of students' learning, the evaluation process and criteria, challenges encountered, and recommendations for modifications to enhance student engagement with the tools.

Regarding the assessment process for the AI-integrated project, one of the major evaluation criteria applied across courses was to maintain the core originality of students' ideas and evaluate how students enhanced their initial plans to make them more professional. It was suggested that the focus should be on using GAI to visualize students' original ideas (e.g., store exterior and interior designs or marketing infographics) to support the learning process, rather than simply obtaining outcomes with less time and effort. Additionally, feasibility and the development of realistic plans were identified as important evaluation criteria when integrating AI tools into projects. The findings suggested that AI-generated images often present less feasible or less realistic visuals that may not be implementable in real-world contexts. In this regard, students' active involvement in using prompts and effectively communicating with GAI until achieving their targeted outcomes was identified as an essential skill.

For challenges and future directions for improvement, issues such as errors or incompleteness in AI-generated outcomes and the need for multiple iterations to achieve satisfactory results were identified. Students often felt frustrated when their inputs did not translate into the desired outputs, finding the process less convenient compared to non-AI-based software tools. As a future direction, it was suggested that prep-sessions, where students can practice their skills in communicating with AI and experimenting with prompts, would be effective for student learning before starting the project. Furthermore, incorporating several mid-project check-in feedback sessions was recommended. Additionally, the gap between instructors' expectations and students' actual use of GAI tools in the project was also discussed across courses. To stimulate students' curiosity and encourage active engagement with the project using GAI tools, the study highlighted the importance of valuing the process of refining their work and clearly communicating the evaluation criteria for future applications.

The study provides both scholarly and practical implications. While previous research has primarily focused on ethical issues or the intention to use GAI tools, the present study emphasizes their practical utilization by elaborating on projects implemented in marketing fashion courses and the challenges involved in improving curriculum planning. Additionally, there is a lack of AI-related pedagogical research in the marketing and fashion fields. This study contributes to opening the discussion on effective GAI integration into student projects, considering that academia is still in the early stages of adopting GAI. From a practical perspective, the study offers valuable guidance to educators on designing student projects that facilitate learning the applications of GAI. It explores students' experiences in conducting projects using GAI, the challenges they faced, and strategies for addressing these challenges to enhance learning outcomes. It offers insights into updating the curricula to align with the rapidly evolving industry driven by GAI adoption, enabling students to develop their ideas professionally and apply the necessary skills for their future careers.

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GenAI in Service-learning: Micro Assessing Higher Order Skills

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ABSTRACT

The paper reports the outcomes of a 2024-2025 effort to integrate generative artificial intelligence (Gen AI) in an undergraduate international business course that has a service-learning component. Following deconstruction and examination of the target course, GenAI was incorporated into the service-learning project research, freeing time for students to use AI-generated information to inform critical thinking exercises. The researcher conducted a micro-assessment of student self-reported outcomes to measure before and after levels of experience in technical areas needed for success and critical thinking exercises. These results, when examined in tandem with the project results, support the use of GenAI as a tool to enhance students' higher-order skills mastery using Bloom's Taxonomy. The literature reviews (1) service-learning in pedagogy to increase student learning, community-minded behavior, and personal reflection; (2) Bloom's Taxonomy as an assessment guide for higher order skills mastery; and, (3) generative artificial intelligence (GenAI) as a tool for developing enhanced critical thinking skills. The author concludes with an examination of next steps to inform curriculum developers in the use of GenAI in similar settings.

Keywords: GenAI, Service-learning, Bloom's Taxonomy, AACSB, Societal Impact, International Business, Student Teams, Reflection, Micro Assessment

INTRODUCTION

Universities are wrestling with policies and procedures related to both student and faculty use of generative artificial intelligence (GenAI), recognizing its importance to students' futures. The confluence of business and industry expectations for its use by graduates is fueling institutional decisions regarding new courses, majors, and programs incorporating GenAI instruction. While resistance may be futile, concerns remain about GenAI: ethical presumptions in the software itself; its learning capability; the environmental impacts from energy and water usage; and, how to measure its costs and benefits. As institutions of higher learning appear to be both charging the front lines and cowering fearfully before a GenAI "Goliath", educators who synthesize GenAI into curriculum will produce well-prepared critical thinkers.

The quality of AI's generative capability, accuracy, and its depth of knowledge have driven much current research, justified by academic intent to use the best possible versions of generative AI tools. Raman et al. (2024) examine ChatGPT's literacy of the U.N. Sustainable Goals across three competency levels, and recommend enhanced competencies. Specific investigation benefits universities whose accrediting bodies encourage societal impact focused on the measurement of the U.N. Sustainable Goals in curriculum. The World Economic Forum (2025) *Future of Jobs Report 2025*, which measures perspectives of 1,000+ employers, suggests that the demand for AI and big data, networks, cybersecurity, and technological literacy, will be among the fastest-growing skills. The *Chronicle of Higher Education* 2023 poll of academic thought leaders (Caplan et al., 2023) suggested that classrooms must become more deliberate and open to experience; academics must prepare for a fundamental shift in research; universities will become more efficient as GenAI helps control costs; education will be revitalized; and the gap between information transfer and knowledge production will grow.

LITERATURE REVIEW

Service-learning

For AACSB-accredited universities, service learning offers an excellent method to assure societal impact and what has become known as "closing the loop" among curriculum, assessment, innovation, engagement, and learner success. Service-learning, as a pedagogical approach, is designed to increase student learning through active service with a community partner, personal reflection, and skill application. Bringle and Hatcher (1996), whose definition of service-learning is often used to describe its purpose and functions, note ten (10) types of activities for stakeholder groups in service-learning, broadly arranged as:

1. Planning
2. Awareness
3. Prototype

4. Resources
5. Expansion
6. Recognition
7. Monitoring
8. Evaluation
9. Research
10. Institutionalization

Eyler and Giles (1999) further support the positive impacts that service-learning has on academic learning, with students self-reporting the following outcomes (among others):

- Deeper understanding of course material
- Improved ability to apply material they learn in class to real problems
- Improved leadership skills
- Increased sense of connection to the community
- Greater self-knowledge

Berry and Workman (2007) ascribe community as both the client (community partner) and the community at large, and note the value of service-learning as contributing to higher level learning. Service-learning can take many forms; therefore, each approach requires developing appropriate assessments of the student experience in conjunction with the objectives of the course.

Bloom's Taxonomy

Self-reflection is a common form of evaluation in service-learning courses and is considered to be a mid-to higher level application in Bloom's Taxonomy of Educational Objectives (Bloom's Taxonomy, n.d.). The six major categories of Bloom's Taxonomy are: Level 1, Knowledge; Level 2, Comprehension/Understanding; Level 3, Application; Level 4, Analysis; Level 5, Synthesis; and, Level 6, Evaluation. At Level 3, Application, students should be able to demonstrate, give examples, apply, construct, interpret, investigate, and use. At Level 4, Analysis, students can successfully compare, contrast, analyze, differentiate, inspect, question, relate, solve, and test. Level 5, Synthesis, is observed in students who can design, integrate, propose, formulate, organize, and synthesize. Level 6, Evaluation, is achieved when students can assess, estimate, evaluate, choose, compare, contrast, decide, grade, judge, measure, rate, revise, score, select, value, and weigh. The framework was revised in 2001 to create a more dynamic model: Level 1, Remember; Level 2, Understand; Level 3, Apply; Level 4, Analyze; Level 5, Evaluate; and, Level 6, Create. Eber and Parker (2007) support the use of instructional feedback and rubrics to assist students' comprehension of learning measures, pointing out that much classroom instruction occurs at the lower levels of student cognition as ordered in Bloom's Taxonomy.

Artificial Intelligence (AI)

The researcher opened a chatbot on 6/3/2025, and asked ChatGPT, "Please describe some types of learning activities for university students that will help them achieve high order skills in Bloom's Taxonomy. It answered with the following (in under 15 seconds):

Higher-order thinking skills in Bloom's Taxonomy refer to the top three levels: analyzing, evaluating, and creating. Here are learning activities tailored for university students that target these levels:

Analyzing (Level 4) Students break information into parts to understand structure and relationships. Activities:

Case Study Analysis: Students dissect a real-world case relevant to their field, identifying key components, causes, and consequences.

Comparative Essays: Compare and contrast theories, models, or perspectives.

Data Interpretation Exercises: Analyze graphs, research results, or statistical data and draw conclusions.

Concept Mapping: Create visual maps that show relationships between ideas or concepts.

Critical Reading Assignments: Annotate and critique scholarly texts to identify underlying assumptions or arguments.

Evaluating (Level 5) Students make judgments based on criteria and standards. Activities:

Peer Review: Evaluate classmates' work using rubrics, providing constructive feedback.

Debates: Take and defend a position using evidence and logic.

Reflective Journals: Critically assess one's own learning process and decisions.

Ethical Dilemma Discussions: Examine complex ethical situations and evaluate possible responses.

Literature Review Projects: Critically evaluate the strength and relevance of different research studies

Creating (Level 6) Students put elements together to form a coherent whole or invent something new. Activities:

Research Projects: Design and carry out original investigations or experiments.

Capstone Projects: Integrate and apply knowledge in a comprehensive final product (e.g., report, performance, portfolio).

Innovation Challenges: Develop a new product, app, or system to address a real-world problem.

Proposal Writing: Draft grant applications, business plans, or policy proposals.

Multimedia Presentations: Create and present digital content (videos, podcasts, infographics) demonstrating synthesis of ideas.

Tips for Instructors:

Use authentic assessments that mirror real-world tasks.

Provide scaffolding and formative feedback to guide students through these complex tasks.

Encourage collaborative learning for shared idea development and peer support.

(OpenAI, n.d.)

Other studies have examined the use of chatbots in conjunction with Bloom's Taxonomy to increase student learning. Hultberg et al. (2024) acknowledge that the use of new technologies is necessary to increase student engagement and learning. develop a strategic decision-making framework for AI and machine-learning (ML). Mustafidah et al. (2022) review the Revised Bloom's Taxonomy and natural language processing using AI to determine the levels of cognition in student testing, expressing that "a good and correct, valid, and reliable learning assessment will reveal the level of achievement and actual learning conditions." Thanh et al. (202*) acknowledge criticisms of Bloom's Taxonomy regarding its applicability across disciplines. Jaiswal & Arun (2021) examine the potential for AI-enhanced learning in India's education system with the goal of producing graduates who have skills related to "critical thinking, leadership, communication, and teamwork". Jin et al. (2023) support the use of AI to complement self-regulated learning strategies. There is a caution, though, from Baskoro et al. (2023) for those who would use AI to improve students' critical thinking (CT) skills. The tool can be misused if AI is used to replace exploration thus having a negative effect on critical thinking.

Generative AI's acceptance and use in higher education is growing, even as institutions and academic journals develop policies regarding its ethical use. Many universities are conducting internal assessments of faculty use to determine applications, the need for training, and the popularity of products. The Solvay Brussels School of Economics & Management noted an 86% internal adoption of digital technologies, with 65% having adopted generative AI, mainly ChatGPT and Copilot. The main training needs SBS identified were along the axes of integration of AI, active pedagogy, digital skills, and time/resource management. (Ellyton, Malz, and Desoutter, 2025)

COURSE REDESIGN

Course Description

As a 300-level service-learning course, Global Dimensions of Business is offered in two sections during each of the fall and spring semesters. Junior-level students (60-89 semester hours) comprise the majority of those enrolled; however, the course has no pre-requisites, and it is not uncommon for sophomore-level students (30-59 semester hours), senior-level students (90 or more semester hours), and even freshman-level students (29 or fewer semester hours) to be enrolled. Ideally, students will have already taken macro and micro economics, finance, management, and marketing prior to enrolling in Global Dimensions of Business. However, the class routinely has students co-enrolled in those courses. Total annual enrollment across all sections of the course is approximately 125 students, averaging 57.3% in-state, 31.9% out-of-state, and, 10.6% international. Along the broad binary of masculine and feminine, some 43.4% of students historically identified as female; while the remainder identified as male.

The community partner is a U.S. state agency that promotes exporting and inward foreign direct investment. Student

teams prepare a business development briefing for in-state businesses seeking export partners, markets for their products and services, and potential locations for foreign direct investment. The project is outlined in a template, provided to each team through Google docs. Teams work on five sections of the project in the shared drive with completed sections due along a timeline of every 2-4 weeks. Teams assign individual members to gather the required information, then collaborate with the team to prepare the project. One critical thinking activity is included in a decision model at the end of the project. Reliable sources of information are provided in the course learning management system. Following the submission of each project component, students complete an individual reflection assignment of between 200-300 words using a series of prompt questions focused on the team's time management, leadership, and collaboration as well as the individual's assessment of self, their contribution, and plans for future action. At the end of the semester, prior to the final exam, students formally present their project recommendations in a recorded presentation. Both the presentation and the completed project are linked for the community partner. During spring 2024, the course objectives and outcomes were assessed using Bloom's Taxonomy for lower and higher order skills, and four team activities designed to improve higher order skills were added.

Engaging GenAI

Over three semesters, beginning in January 2024, GenAI was gradually introduced into the course:

1. Semester 1 (Spring 2024): Students were given the option to use ChatGPT for the project and experiment with it.
2. Semester 2 (Fall 2024): Students were required to use ChatGPT for individual parts of the project, then edits were made to form, and original sources were used to fact-check and revise. Critical thinking exercises were introduced to the teams for discussion in class.
3. Semester 3 (Spring 2025): Students were required to use ChatGPT for the project, prompts were practiced, critical thinking exercises were completed in class with the teams for a team grade.

Table 1: Critical Thinking Exercises

Project Sections	Bloom's, Original	Bloom's, Revision	Decision Exercise -Student Team
1	L1, L2	L1, L2, L3, L4	SWOT Analysis
2	L1, L2, L3	L1, L2, L3, L4	TOWS Matrix
3	L1, L2, L3	L1, L2, L3, L4, L5	Industry Assessment
4	L1, L2, L3	L1, L2, L3, L4, L5, L6	Country Assessment
5	L1, L2, L3, L4	L1, L2, L3, L4, L5, L6	Country Attractiveness Model

Students are provided instruction from the university's Writing Center on the development of prompts, information in the syllabus regarding the ethical use of AI, and definitions of service-learning and critical thinking. Students have initially been reluctant participants when authorized to use Gen AI for assignments, based on prior experience. On the first day of class, students are asked a series of questions in open discussion regarding the use of generative AI.

Q1: "How many of you have used ChatGPT or another generative AI model for assignments?" Initially, no students raise their hands.

Q2: "You are not in trouble if you raise your hand. We are using ChatGPT in this course for your project, and I need an understanding of how many of you are familiar with the model." Approximately 35% of students raise their hands.

Q3: "Does anyone have reservations or hesitations about using ChatGPT?" About 15% raise hands.

Q4: "Why are you concerned?" Those who respond indicate that they have been previously instructed not to use it, it's ethically wrong to use it, and it's like plagiarism.

Students are advised that individual project research should be done according to the schedule using ChatGPT, but that all critical thinking exercises will be completed in class with the team, using their own knowledge. A complication for the scheduled in class exercises is absenteeism; however, the team schedule is published and accommodations are made to allow for excused absences and decrease social loafing. During the first two semesters, adjustments were made to the assignments, the timing, and to classroom instruction based on student comments and personal observations of the outcomes of their work. More detailed instructions regarding prompts were developed; more time was allowed for completion of the critical thinking exercises; additional team-building assignments were added; and more time was allowed to review preliminary research.

Micro Assessment

During the third semester (Spring 2025) student learning was assessed using a questionnaire administered before the final exam. All students (65) completed the instrument, with extra credit offered for completion. The three questions/items were: (1) Thinking back to your first day of class, what was your level of experience in each of the following areas? (2) How would you classify your level of experience today in each of the following areas? (3) List any other technical areas not covered that you feel you gained experience and skills in (open ended).

Table 2: First Day Level of Experience

Area	None (0)	Low (1)	Moderate (2)	Advanced (3)	Average (0-3)
	No./Pct.	No./Pct.	No./Pct.	No./Pct.	Mean score
Use of APA format	5/.076	35/.538	24/.369	2/.030	1.35
Use of Google drive for document sharing	2/.030	14/.215	26/.400	23/.353	2.00
Use of Zoom for video conferencing	9/.138	19/.292	23/.353	14/.215	1.58
Use of ChatGPT	8/.123	16/.246	23/.353	18/.276	1.78
SWOT Analysis	26/.400	15/.230	19/.292	5/.076	1.04
TOWS Matrix	41/.630	15/.230	9/.138	0/.000	0.50
Industry Analysis	42/.646	15/.230	7/.107	1/.015	0.49
Country Analysis	41/.630	12/.184	10/.153	1/.015	0.55
Team projects	2/.030	13/.200	28/.430	22/.338	2.07
Creating tables within documents	5/.076	20/.307	27/.415	13/.200	1.73
Analyzing the work of others	0/.000	25/.384	29/.446	11/.169	1.78
Reflecting on your own work	0/.000	13/.200	30/.461	22/.338	2.13

From their recollection of the first day of class, over 60% of students expressed low or no exposure to APA format, which is concerning as it is the format of choice in business publications and reports. About 50% had little to no experience with Google docs, though the university's cloud storage and email service is Google-based. Zoom was a challenge for many students, although most used some type of video conferencing technology for high school courses. Because the university shifted away from all forms of video conferencing post-pandemic, students are not exposed to video conferencing except through specific exercises such as this, in which they are challenged to set up a Zoom meeting, share a prepared document, and record the presentation. Students are far more familiar with ChatGPT than they prefer their professors to know. Only 12% reported no experience with ChatGPT, while the remainder responded that they had low experience (24.6%), moderate experience (35.3%), or advanced experience (27.6%). Students were expected to have very limited experience with the critical thinking exercises (SWOT, TOWS, IA, CA, and Country Attractiveness Model), though SWOT is a concept the students who have taken Marketing have had. About 40% indicated no familiarity with SWOT, while 52% indicated low to moderate experience with the tool. An indication of the number of higher class (JR-SR) marketing majors is indicated by the 7.6% who expressed advanced experience with SWOT. The previously mentioned Country Attractiveness Model was not measured experientially as it is unique to this course, and students would not be expected to have any exposure to it through other courses. As shown in the first table, over 80% of students in the course had little to no experience with TOWS, IA, or CA.

Only 3% of students had no previous experience with team projects, while 33% considered themselves advanced in the team experience. The remainder had low to moderate experience with teams prior to the course. A technical concern that needs further attention is students' lack of experience in creating tables (Excel or Word) within documents. There were two reflection assignments in which students were instructed to create a table to illustrate an evaluation of self and team members. Several were unable to accomplish this task without further instruction by the professor. This suggests that there are certain skills that will be beneficial to them in the future that they do not bring from high school and may not be achieving in the first years of college. Interestingly, all students expressed that they had some experience with self-reflection and analyzing the work of others. Just under one-third (33.8%) felt their skill in self-evaluation was advanced by the time they began the course; while almost 17% were confident in their ability to evaluate the work of others.

Table 3: Last Day Level of Experience (Perceived Learning)

Area	None (0)	Low (1)	Moderate (2)	Advanced (3)	Average (0-3)	Perceived Learning
	No./Pct.	No./Pct.	No./Pct.	No./Pct.	Mean score	Pct.
Use of APA format	0/.000	5/.076	37/.569	23/.353	2.27	68.1
Use of Google drive for document sharing	0/.000	0/.000	17/.261	48/.738	2.73	36.9
Use of Zoom for video conferencing	0/.000	2/.030	41/.630	22/.338	2.30	45.6
Use of ChatGPT	0/.000	1/.015	15/.230	50/.769	2.73	53.4
SWOT Analysis	0/.000	3/.046	37/.569	25/.384	2.33	123.5
TOWS Matrix	0/.000	9/.138	41/.630	15/.230	2.09	312.1
Industry Analysis	0/.000	9/.138	40/.615	16/.246	2.10	328.1
Country Analysis	0/.000	5/.076	39/.600	22/.338	2.24	305.5
Team projects	0/.000	1/.015	16/.246	48/.738	2.72	31.1
Creating tables within documents	2/.030	1/.015	28/.430	34/.523	2.44	40.7
Analyzing the work of others	1/.015	2.030	20/.307	42/.646	2.56	43.9
Reflecting on your own work	0/.000	1/.015	19/.292	45/.753	2.67	25.1

Students who had no experience with creating and inserting tables in documents were offered a tutorial by the professor. Still, two students did not take advantage of the offer, leading to a post-class reflection of no experience with the skill. The one student who reported no experience evaluating others did not complete any reflection assignments. Otherwise, all students who completed the survey gained experience in most areas about which they were queried, based on their perception of their learning. While one might argue that students do not command advanced experience in the areas noted, by virtue of their age, exposure, and practice, this was a self-report survey which allowed the student to measure their gained experience relative to their beginning level. For those reasons, the table focuses on self-reported improvement (perceived learning) in each area as determined by calculation of the percentage difference between beginning and ending aggregate scores in each category. All mean scores indicated a level of exposure exceeding moderate experience. The greatest level of improvement was reported in the critical thinking exercises, owing to first time exposure to most of the tools, except SWOT. In rank order from greatest to least, students expressed increased improvement/experience in:

- (1) Industry Analysis
- (2) TOWS Matrix
- (3) Country Analysis
- (4) Use of APA format
- (5) Use of ChatGPT
- (6) Use of Zoom for video-conferencing
- (7) Analyzing the work of others
- (8) Creating tables in documents
- (9) Using Google drive
- (10) Team projects
- (11) Reflecting on own work

As part of the survey, students were asked to add other areas in which they believed they gained experience. While not all students offered information, most did, and their responses were thoughtful.

The most frequently cited new experience was speaking in public (86.1%). Students were frequently asked in class to offer opinions, speak on behalf of the team, and present work. Almost 37% suggested increased experience in communication was important to them, while a similar percentage (36.9%) said their time management skills had sharpened. Research and leadership skills were noted by 21.5% of students, and 15.3% noted increase experience in

“team skills” of collaboration, feedback, patience and tolerance. Additional single skills noted, such as delegation, staying on topic, work ethic, moral courage/hazard, proofreading, etc. can be subsumed under team skills.

LIMITATIONS

The scale and scope of the review are limited to one institution and one business core class that is taught by one professor. Its advantage is its ability to closely examine a particular course over several semesters with the purpose of incremental improvement in curriculum and student learning outcomes. No attempt was made to pre-test student skills and critical thinking ability prior to the end-of-semester assessment to provide a more objective measure increased proficiency in each area. Students’ self-reported improvement is not affirmed by triangulation, so is perceived learning. However, the micro-assessment is a valuable tool to determine areas in which remediation is needed and students’ own perceptions of self-ability.

FUTURE RESEARCH

More research is needed to examine several areas related to the understanding and application of generative artificial intelligence tools in business courses that instruct in communication, management and leadership, research, and critical thinking. Among the lines of future research are:

- (1) the relationship between service-learning partner expectations and student outcomes associated with the application of AI;
- (2) differences between the perceived student value of GenAI and the perceived faculty value of GenAI
- (3) the use of AI as a tool for inclusivity in diverse team decision-making;
- (4) the impact of AI’s use on student engagement in project-driven courses; and,
- (5) students’ understanding of critical thinking when using GenAI as a tool in learning.

Table 4: Other areas where experience and skills were gained

Area	No.	Pct.
Leadership	14	21.5
Time Management	24	36.9
Research	14	21.5
Communication	24	36.9
Critical Thinking/Problem Solving	9	13.8
Presentations (format)	5	7.6
Moral courage/moral hazard	1	1.5
Networking	1	1.5
Public speaking	56	86.1
Detail orientation	1	1.5
Organization	4	6.1
Delegation	1	1.5
Staying on topic	1	1.5
Collaboration/feedback/patience/tolerance	10	1.5
Work ethic	2	3.0
Other technical skills	3	4.6
Editing/Proofreading	1	1.5
Self-discipline	1	1.5

CONCLUSION

For courses that are not included in the department’s regularly scheduled assurance of learning assessments, micro-assessing can provide rich data for instructors to improve objective-specific outcomes, beyond the traditional (and sometimes controversial) student assessments. Additionally, micro-assessing can create a framework for faculty portfolio guidance in reporting year-over-year improvements. Course for which there are no cataloged pre-requisite

courses can be used to benchmark incoming student skills to help in institutional effectiveness, resource allocation, and development of core learning goals.

For project-based service-learning courses, generative AI can be used to complement student learning and empowerment, if carefully designed to enhance critical thinking. Resulting projects are generally more cohesive and consistent across multi-level student teams as long as the desired outcome is based on executive-level reporting. Team-based projects can be an asset in student portfolios and indicate to prospective employers that students have experience managing and leading student teams, collaborating, and providing meaningful feedback. Care should be taken to assure students that GenAI is a time-saving tool to be mastered in the development of critical thinking. Finished service-learning projects are more uniform and of higher quality, given that students spend less time on refining their individual writing and more time in collaborative decision-making.

The micro assessment in this example captured the faculty member's expected outcomes: improved team dynamics as students are better able to manage time related to the completion of lower-level skills; better synthesis of applications and models that students use across the business curriculum; more and better decision options for the service-learning partner; higher student retention of course content; greater integration of theoretical knowledge with practical skills; and, graduates able to perform at higher levels in the workforce. Educators considering the use of GenAI as a research tool in project-based courses should (1) have expertise in reliable sources of information; (2) exemplify to students the societal impact of their applied projects; (4) develop relevant activities that reinforce course objectives and teach new concepts; and (5) provide meaningful opportunities for students to reflect on their learning to develop critical thinking skills.

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Career Path and Competency Perceptions in Public Accounting: Implications for Education and Licensure Standards

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ABSTRACT

Researchers and practitioners agree on the urgent need to increase the number of public accountants entering the workforce (AICPA, 2021a; Dawkins, 2023). In response, organizations such as the AICPA and the American Accounting Association, as well as regulatory bodies, have continuously updated competency frameworks for entry-level accountants (AICPA, 2021a, 2021b, 2022b). However, many practitioners maintain that new graduates still lack the required competencies (Pasewark, 2021; Richardson, 2020; Sandifer, 2018; Thomson, 2017). Traditionally, CPA firms continue to hire accounting graduates based on their chosen career path, which some argue influences the competencies included in the accounting curriculum and the CPA Exam (Dalton et al., 2014; Richardson, 2020).

This study examines whether a CPA's career path influences their perceptions of essential competencies and whether recent graduates are seen as meeting those expectations (Mulhollen, 2024). Results show that career path has minimal influence, indicating general agreement across the profession. These findings provide useful guidance for educators designing curricula that attract and prepare accounting students and help standard-setters refine competency expectations applicable across career tracks.

Keywords: Accounting education, CPA Licensure, professional competencies, career path perceptions, workforce readiness

INTRODUCTION

As fewer individuals pursue CPA careers, the accounting profession faces increasing difficulty meeting workforce demands while maintaining high entry-level competency standards (AICPA, 2021a, 2022b; Dawkins, 2023). This talent shortage has heightened the urgency to align accounting education with the profession's practical needs. In response, the American Institute of Certified Public Accountants (AICPA) and the American Accounting Association have implemented significant reforms, including updates to CPA licensure standards and the redesign of the CPA Exam, to reflect evolving employer expectations and better prepare graduates for the realities of public accounting (AICPA, 2021a, 2021b, 2022b).

Despite these efforts, a disconnect remains between classroom instruction and professional practice. Traditionally, CPA firms continue to hire accounting graduates based on their chosen career path, which some argue influences the competencies included in the accounting curriculum and the CPA Exam (Dalton et al., 2014; Richardson, 2020). Many practitioners continue to express concern that graduates enter the field lacking critical competencies such as data analytics, professional judgment, and real-world problem-solving skills, as well as essential soft skills including communication, teamwork, and leadership (Dawkins, 2023; Sandifer, 2018; Thomson, 2017). These interpersonal and managerial abilities, together with technical expertise, are central to workplace readiness and are analyzed later in this study (see Table 2).

One factor that may influence these perceptions is the CPA's career path. Prior studies suggest that an accountant's specialization, such as a career in audit or tax, can shape their expectations for both the skills new graduates should possess and the extent to which those skills are demonstrated (Richardson, 2020). Specialization may influence what professionals prioritize in a new hire, potentially driving variation in how competencies are interpreted, taught, and assessed (Dalton et al., 2014; Richardson, 2020; Shulman, 2005). However, limited empirical evidence exists on the degree to which a CPA's career path affects their views on competency requirements or attainment.

This study aims to address that gap by examining whether a CPA's career path has a meaningful influence on their perception of the competencies that accounting graduates need to enter the workforce, and whether those graduates are effectively demonstrating those competencies. Understanding whether perceptions of the required and attained competencies vary by career path can provide valuable guidance to educators, curriculum designers, and standard-setters striving to produce graduates who are both well-prepared and attractive to employers across the public

accounting spectrum. Ultimately, the findings aim to support a more unified, competency-based approach to accounting education that meets the needs of the profession while helping to reverse the decline in the number of CPA candidates.

RESEARCH PROBLEM AND OBJECTIVES

Although accounting graduates are expected to enter the workforce equipped with the competencies necessary for professional success, many employers continue to report that graduates fall short of meeting these expectations (Pasewark, 2021; Richardson, 2020; Sandifer, 2018). This ongoing skills gap has raised concerns about the effectiveness of accounting education in preparing students for the practical demands of public accounting (Dawkins, 2023; Dawkins & Dugan, 2022). In response, educators and professional organizations have intensified efforts to align academic curricula with the evolving needs of the profession, yet uncertainty remains about which competencies are most critical and whether graduates are achieving them (AICPA, 2021a, 2022b; Richardson, 2020; Sandifer, 2018).

This study contributes to that conversation by clarifying employer expectations and graduate readiness through the lens of career specialization. Specifically, it aims to answer the question "Does a CPA's career path influence their perceptions of both the competencies accounting graduates should possess and the extent to which graduates demonstrate those competencies?"

The study has two primary objectives: (1) to determine whether CPAs in specializing in an audit or tax career path hold distinct views on the competencies required for entry into the accounting workforce, and (2) to assess whether these same professionals perceive meaningful differences in how well graduates are demonstrating the attainment of those competencies. As demonstrated in the theoretical development section, audit and tax career paths were selected as focal points because they are the two dominant practice areas in public accounting and have historically influenced the design and evaluation of accounting curricula and CPA licensure requirements.

THEORETICAL DEVELOPMENT

Despite a growing shortage of talent in the accounting profession, employer expectations for new hires continue to rise. Today's graduates are expected not only to demonstrate core accounting knowledge but also to possess broader competencies in areas such as data analytics, critical thinking, and business advisory services (AICPA, 2021a; Dawkins & Dugan, 2022; Pasewark, 2021). In response to perceived skill gaps, employers are increasingly filling traditional accounting roles with candidates from non-accounting backgrounds who possess relevant practical competencies (AICPA, 2021a). This trend underscores the pressing need to understand employer expectations and evaluate the effectiveness of accounting programs in preparing students to meet them (Dawkins, 2023; Dawkins & Dugan, 2022; Mulhollen, 2024).

Debates over the appropriate competencies for accounting graduates have persisted for decades. In response to audit failures, financial reporting inconsistencies, and evolving market needs, the profession has commissioned several influential reports, including the landmark 2015 final report of the Pathways Commission. This report called for significant changes in accounting education, emphasizing the need for new graduates to enter the workforce with competencies that reflect the demands of a dynamic and technology-driven profession (Black, 2012).

The AICPA's *2021 Trends Report* reinforced this call by emphasizing the importance of sustaining a talent pipeline equipped with the skills necessary to meet evolving industry demands (AICPA, 2021a). However, the report also underscored growing recruitment challenges, including a decline in the number of accounting graduates and an increasing number of CPA exam candidates who appear underprepared for licensure. In response, firms are increasingly hiring non-accounting graduates to fill roles traditionally reserved for accounting majors. Dawkins (2023) responded to these developments by calling on educators to reassess the relevance of the curriculum, collaborate more closely with employers to stimulate student interest in the profession, and reevaluate entry barriers, such as the 150-hour CPA rule.

In this context, competency refers to the observable knowledge, skills, and abilities necessary for effective job performance. These include the ability to apply technical knowledge, evaluate complex situations, and reflect on performance to drive continuous improvement (Epley et al., 2017; Chouhan & Srivastava, 2014; Austin, 2019). Among public accountants, the CPA Exam has long served as a benchmark for entry-level competency (AICPA, 2021b, 2022b; Stone, 2020). To maintain alignment with practice demands, the AICPA regularly revises its Uniform

CPA Examination Blueprints. The version effective from July 2021 to December 2023 defined essential competencies across four major areas: audit and attestation, business environment and concepts, financial accounting and reporting, and regulation.

Following a major research initiative in 2020, the AICPA launched a redesigned CPA Exam in January 2025. While the revised exam retains core content in audit, financial accounting, and regulation, it introduces a specialization component, allowing candidates to focus on one of three new disciplines: business analysis and reporting, information systems and controls, or tax compliance and planning (AICPA, 2022a, 2022b). This new structure reflects a shift toward deeper specialization in the profession, aiming to ensure that newly licensed CPAs are better equipped with competencies aligned to their chosen paths (AICPA, 2022b).

Nevertheless, despite these improvements, researchers and employers continue to voice concerns that accounting graduates are not adequately prepared to meet the profession's evolving demands (Pasewark, 2021). Several studies suggest that while graduates may possess sufficient technical knowledge, they often lack key employability skills, such as critical thinking, decision-making, and communication (Bryant, 2019; Richardson, 2020; Sandifer, 2018). Sandifer's (2018) research found that although the AICPA's competency framework largely aligns with employer expectations, hiring managers consistently identified soft skills as a significant area of deficiency. The study recommended closer collaboration between educators and employers, particularly through experiential learning opportunities such as internships, to help bridge the gap between classroom learning and professional performance.

Richardson (2020) extended Sandifer's (2018) work in a study of CPAs in Texas public accounting firms. He confirmed that employers perceive a persistent mismatch between the competencies they expect from Master's-level graduates and the competencies those graduates actually demonstrate. Richardson also identified concerns related to soft skills, timing of CPA exam completion, and gaps in workplace readiness. These findings reinforced the notion that a gap persists in the perception of what competencies are required and the perception of the attainment of these competencies at entry into public accounting.

Of particular relevance to the present study, Richardson's (2020) research also suggested that CPAs' perceptions of skill gaps vary by career path, indicating that a professional's specialization may significantly influence how they evaluate the alignment between graduate competencies and workforce expectations. However, neither Richardson's (2020) nor Sandifer's (2018) study directly examined how specific career paths shape perceptions of required and demonstrated competencies. That gap serves as the primary motivation for the present research.

This study aims to answer the question "Does a CPA's career path influence their perceptions of both the competencies accounting graduates should possess and the extent to which graduates demonstrate those competencies?" This study will answer this question through the two primary objectives: (1) to determine whether CPAs in specializing in an audit or tax career path hold distinct views on the competencies required for entry into the accounting workforce, and (2) to assess whether these same professionals perceive meaningful differences in how well graduates are demonstrating the attainment of those competencies.

Insights into how career paths affect competency expectations are increasingly vital for both educators designing relevant curricula and employers seeking qualified candidates. Prior studies have shown that accounting students commonly pursue one of two dominant career paths: audit or tax, each with its own set of expectations, workflows, and performance standards (Dalton et al., 2014; Hahn & King, 2021). This divergence presents challenges for educators tasked with designing broadly applicable programs and for firms aiming to hire graduates with role-specific readiness (Sollfrey, 2018). According to the AICPA (2021a), 66% of new accounting graduates are hired into audit roles and 24.2% into tax, underscoring the continued dominance of these two paths and the importance of ensuring that graduates are adequately prepared for both.

By incorporating career path as a variable in the analysis, this study offers a more nuanced understanding of how perceptions of competency vary within the profession. In doing so, it fills a critical gap in the literature, providing valuable insight for educators, employers, and credentialing bodies striving to align accounting education with the evolving demands of public accounting.

Despite a growing talent shortage, employer demands continue to rise, with graduates now expected to possess not only accounting expertise but also skills in areas like business advising and data analytics (AICPA, 2021a; Dawkins & Dugan, 2022; Pasewark, 2021). As a result, employers are increasingly filling traditional accounting roles with

graduates from other fields (AICPA, 2021a). This trend highlights the importance of understanding employer expectations and assessing the effectiveness of accounting programs in preparing students to meet them (Dawkins, 2023; Dawkins & Dugan, 2022; Mulhollen, 2024).

METHODOLOGY

This study employed a quantitative causal-comparative research design, which is appropriate for investigating potential cause-and-effect relationships by comparing outcomes across naturally occurring groups that differ on a key independent variable (Meltzoff & Cooper, 2018). While causal-comparative designs do not involve the direct manipulation of variables, they allow researchers to explore associations and potential causal patterns using observational data. This approach is particularly well-suited to the present study, which aims to examine whether a CPA's career path—specifically in audit or tax—influences their perceptions of both required and attained competencies in accounting graduates.

Unlike experimental designs, causal-comparative studies do not require random assignment or control over extraneous variables. Instead, they rely on existing group characteristics, which in this case are self-identified areas of specialization within the public accounting field. Because the study's independent variable (career path) is not manipulated and participants self-select into their respective groups, the research design is classified as observational and non-experimental (Shadish et al., 2002; Remler & Ryzin, 2022). This design is suitable for professional field studies where random assignment is either not feasible or unethical.

The population targeted for this study was similar to that used in Sandifer's (2018) foundational research: members of the Mississippi Society of Certified Public Accountants (MSCPA) employed in public accounting firms. To ensure comparability and relevance, the sample was limited to CPAs who had recent supervisory or hiring experience with entry-level accounting graduates, defined as those with five years or fewer of experience in the profession (Mulhollen, 2024). Participants were selected using purposive sampling to ensure the inclusion of individuals with firsthand experience in assessing graduate preparedness. To enhance response rates, participants were incentivized with the opportunity to win one of two \$100 Amazon gift cards, consistent with best practices in survey research (Bourque & Fielder, 2003).

The survey instrument used in this study was adapted from Sandifer's (2018) original tool, an ordinal five-point Likert scale, developed to measure CPA perceptions of graduate competencies. The revised instrument consisted of 23 items, distributed across five key competency areas. The Likert scale visible to participants ranged from “Unimportant” at the lowest point to “Very Important” at the highest point. These visible values were supported by a numerical scale ranging from one at the lowest point and five at the highest point (Sandifer, 2018). Four of the sections aligned directly with the AICPA's 2021 Uniform CPA Examination Blueprint: Audit and Attestation (A&A), Business Environment and Concepts (BEC), Financial Accounting and Reporting (FAR), and Regulation (REG) (AICPA, 2021b). A fifth section, focused on technical and employability skills, was retained from Sandifer's design to reflect the broader range of competencies valued by employers. Permission to adapt and modify the instrument was secured from the original author, and a pilot test was conducted to confirm the instrument's validity and clarity in its revised form (Mulhollen, 2024).

Given the ordinal nature of the survey data and the assumption of non-normal distribution, the Mann-Whitney U test was selected for statistical analysis. This nonparametric test is well-suited for comparing differences between two independent groups when the dependent variable is ordinal or not normally distributed (Laerd Statistics, 2015). All four assumptions required for applying the Mann-Whitney U test were satisfied: (1) the dependent variables were measured at the ordinal level, (2) the independent variable consisted of two groups (audit and tax), (3) the groups were independent of one another, and (4) the distributions were similarly shaped across groups (Richardson, 2020; Sandifer, 2018; Mulhollen, 2024).

RESULTS

A total of 72 qualified responses were obtained from the 1,026 MSCPA members surveyed. Table 1 reflects the study's demographic information. A slightly higher proportion of men than women participated in the study, and the majority held a master's degree or higher. Over 80% of respondents ($n = 60$) were employed at regional or local firms, with most of these firms employing between 41 and 100 individuals ($n = 32$). Over 80% of the respondents ($n = 59$) reported holding positions as managers or partners, including 50.7% ($n = 36$) who were partners. The most represented age

Table 1: Frequency Distribution for Demographics

Demographic	Frequency	Percent
CPA		
Yes	72	100
No	0	0
CPA Who Hired or Supervised an Accounting Graduate in the Last Five Years		
Yes	72	100
No	0	0
Career Path		
Audit and Attestation	30	41.7
Tax	42	58.3
Gender		
Female	33	46.5
Male	37	52.1
Prefer not to identify	1	1.4
Education		
Bachelor's degree	29	40.3
Master's degree	42	58.3
Terminal degree (Ph.D., DBA, JD)	1	1.4
Place of employment		
Public accounting-regional or local firm	60	83.3
Public accounting-national or global firm	12	16.7
Number of People at Company		
Less than 20	21	29.2
21 to 100	32	44.4
101 to 1,000	5	6.9
over 1,000	14	19.4
Position		
Partner	36	50.7
Manager	23	32.4
Senior (in-charge) Accountant	7	9.9
Staff Accountant	1	1.4
Other:		
Senior Manager	2	2.8
Supervisor	1	1.4
Sole Owner	1	1.4
Years of Experience		
0-5	11	15.5
6-10	13	18.3
11-15	9	12.7
16-20	6	8.5
Over 20	32	45.1
Age		
18-25	4	5.6
26-35	10	13.9
36-45	15	20.8
46-55	16	22.2
56-65	20	27.8
Over 65	7	9.7

group was 56–65 (27.8%, $n = 20$), followed by 46–55 ($n = 16$) and 36–45 ($n = 15$). 58.3% ($n = 30$) of the respondents identified themselves as having a tax career path. In comparison, 41.7% ($n = 30$) identified themselves as having an audit career path.

Table 2 presents the Mann-Whitney U test results examining the impact of career path (independent variable) on respondents' perceptions of the required competencies for accounting graduates (dependent variable), and includes the median responses for both the audit and tax career paths. The 'Mann-Whitney U' column reports the U statistic used to assess statistical significance, the 'z' score indicates the distance of the observed value from the population median, and the 'Asymp. Sig.' column provides the p-value used to determine the significance of the comparison (Field, 2018; Laerd Statistics, 2015). A selected analysis of the data follows.

The data analysis indicated no statistically significant differences between audit and tax professionals in their perceptions of the required competencies in the Audit and Attestation or Financial Reporting groups. Statistically significant differences between audit and tax career paths were most evident in the Regulation (REG) competency group. Median required competency scores were statistically significantly higher for tax professionals ($Mdn = 4.00$) than for audit professionals ($Mdn = 3.00$) in both the Federal Tax Procedures competency, $U = 919.50$, $z = 3.47$, $p < .001$, and the Business Law competency, $U = 901.50$, $z = 3.29$, $p = .001$. Tax professionals reported statistically significantly higher median required competency scores than audit professionals across several areas: Business Law ($Mdn = 4.00$ vs. $Mdn = 3.00$; $U = 901.50$, $z = 3.29$, $p = .001$), Federal Taxation of Property Transactions ($Mdn = 4.00$ vs. $Mdn = 3.00$; $U = 936.00$, $z = 3.61$, $p < .001$), and Federal Taxation of Entities ($Mdn = 4.50$ vs. $Mdn = 3.00$; $U = 914.00$, $z = 3.41$, $p < .001$).

The BEC competency group included two statistically significant findings. For both Financial Management and Information Technology, audit and tax professionals reported the same median required competency scores ($Mdn = 4.00$). However, small but statistically significant differences were found: Financial Management ($U = 808.00$, $z = 2.19$, $p = .029$) and Information Technology ($U = 818.00$, $z = 2.32$, $p = .020$). In the Technical Skills and Employability Skills competency group, one statistically significant difference emerged. Tax professionals reported higher median required scores for Computer/Information Technology Skills ($Mdn = 5.00$) compared to audit professionals ($Mdn = 4.00$), $U = 809.00$, $z = 2.22$, $p = .026$.

Table 2: Mann-Whitney U comparison test for the perception of the required competencies for accounting graduates

Perception of Required Competency	Mdn		Test Statistics ^a		
	Audit Career Path	Tax Career Path	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Audit and Attestation (A&A)					
Ethics related to auditing	5.00	5.00	662.00	.454	.650
Professional responsibilities	4.50	5.00	726.50	1.27	.203
General principles	5.00	4.00	540.50	-1.14	.255
Audit and Attestation (A&A)- (Continued)					
Assessing risk and developing planned responses	4.50	4.00	596.00	-.416	.678
Performing audit procedures and obtaining evidence	5.00	4.00	499.00	-1.65	.100
Forming conclusions and reporting	4.00	5.00	638.00	.100	.920
Business Environment and Concepts (BEC)					
Corporate governance	3.00	4.00	771.00	1.71	.088
Economic concepts and analysis	3.00	4.00	740.50	1.36	.173
Financial management	4.00	4.00	808.00	2.19	.029
Information technology	4.00	4.00	818.00	2.32	.020
Operations management	3.00	4.00	784.00	1.86	.063
General business knowledge	4.00	4.00	770.00	1.81	.070

Table 2 Continued on next page

	Mdn		Test Statistics ^a		
	<i>Audit Career Path</i>	<i>Tax Career Path</i>	<i>Mann-Whitney U</i>	<i>Z</i>	<i>Asymp. Sig. (2-tailed)</i>
Perception of Required Competency					
Financial Accounting and Reporting (FAR)					
Conceptual framework of financial accounting	4.50	4.00	544.00	-1.08	.281
Standard setting for financial accounting	4.00	4.00	663.00	.402	.688
Financial reporting	4.00	4.00	607.00	-.285	.775
Financial statement accounts	5.00	5.00	586.00	-.579	.563
Financial transactions	5.00	4.00	588.00	-.528	.597
Financial accounting for state and local governments	3.00	3.00	514.50	-1.38	.167
Regulation (Reg)					
Ethics related to regulation	4.00	5.00	716.50	1.09	.278
Professional responsibilities related to regulation	4.00	4.00	765.50	1.65	.098
Federal tax procedures	3.00	4.00	919.50	3.47	<.001
Business law	3.00	4.00	901.50	3.29	.001
Federal taxation of property transactions	3.00	4.00	936.00	3.61	<.001
Federal taxation of entities	3.00	4.00	914.00	3.41	<.001
Technical skills and Employability skills					
Continuous learning	5.00	5.00	661.50	.413	.680
Decision-making skills	4.00	5.00	790.50	1.92	.055
Oral communication	5.00	5.00	693.00	.858	.391
Written communication	4.00	5.00	732.50	1.35	.178
Listening attentiveness	5.00	5.00	618.00	-.177	.860
Analytical and problem-solving	5.00	5.00	696.00	.940	.347
Critical thinking	5.00	5.00	624.00	-.088	.930
Self-motivation/self-direction	5.00	5.00	606.00	-.381	.703
Professional attitude/Professional demeanor	5.00	5.00	644.00	.213	.832
Teamwork/Group interaction	4.00	4.00	711.50	1.06	.290
Computer skills/information technology skills	4.00	5.00	809.00	2.22	.026
Ethical awareness	4.00	4.00	747.50	1.53	.126
Leadership	4.00	4.00	659.50	.646	.519
Time management and organization	5.00	5.00	656.50	.347	.729
Research skills	4.00	4.00	658.50	.347	.729
Whole of business approach/interdisciplinary approach	4.00	4.00	735.00	1.27	.205

a. Grouping Variable: career path

Table 3 presents the Mann-Whitney U test results for respondents' perceptions of the competencies attained by accounting graduates. The same methodology was used to analyze respondents' perceptions of the required competencies. A selected analysis of the data follows.

No statistically significant differences were found between audit and tax professionals in their perceptions of the attained competencies within the Audit, Attestation, and Regulation groups. However, in the BEC competency group, tax professionals reported significantly higher median scores than audit professionals for Information Technology ($Mdn = 4.00$ vs. 3.00 ; $U = 833.00$, $z = 2.46$, $p = .014$) and Operations Management ($Mdn = 3.00$ vs. 2.00 ; $U = 830.50$, $z = 2.68$, $p = .007$). In the Financial Accounting and Reporting group, the median required competency scores for the Financial Transactions competency were statistically the same for both tax and audit professionals ($Mdn = 3.00$; $U = 469.00$, $z = -1.96$, $p = .050$). Lastly, within the Technical Skills and Employability Skills group, audit professionals rated Ethical Awareness significantly higher than tax professionals ($Mdn = 4.00$ vs. 3.00 ; $U = 473.50$, $z = -1.97$, $p = .049$).

Table 3: Mann-Whitney U comparison test for the perception of the attained competencies for accounting graduates

Perception of Required Competency	Mdn		Test Statistics		
	<i>Audit Career Path</i>	<i>Tax Career Path</i>	<i>Mann-Whitney U</i>	<i>Z</i>	<i>Asymp. Sig. (2-tailed)</i>
Audit and Attestation (A&A)					
Ethics related to auditing	4.00	3.00	604.00	-.320	.749
Professional responsibilities	3.00	3.00	734.00	1.28	.199
General principles	3.00	3.00	637.50	.092	.927
Assessing risk and developing planned responses	2.00	3.00	713.00	1.01	.314
Performing audit procedures and obtaining evidence	3.00	3.00	591.50	-.292	.770
Forming conclusions and reporting	2.00	3.00	777.00	1.76	.078
Business Environment and Concepts (BEC)					
Corporate governance	2.00	3.00	752.50	1.52	.129
Economic concepts and analysis	3.00	3.00	696.00	0.81	.418
Financial management	3.00	3.00	715.50	1.33	.185
Information technology	3.00	4.00	833.00	2.46	.014
Operations management	2.00	3.00	830.50	2.68	.007
General business knowledge	3.00	3.00	631.00	.012	.990
Financial Accounting and Reporting (FAR)					
Conceptual framework of financial accounting	3.00	3.00	573.00	-.694	.488
Standard setting for financial accounting	3.00	3.00	668.00	.465	.642
Financial reporting	3.00	3.00	612.00	-.220	.826
Financial statement accounts	4.00	3.00	473.00	-1.90	.058
Financial transactions	3.00	3.00	469.00	-1.96	.050
Financial Accounting and Reporting (FAR)- (Continued)					
Financial accounting for state and local governments	2.00	2.00	650.00	.245	.806
Regulation (Reg)					
Ethics related to regulation	3.00	3.00	658.00	.336	.737
Professional responsibilities related to regulation	3.00	3.00	648.00	.217	.829
Federal tax procedures	2.00	3.00	727.50	1.18	.236
Business law	3.00	3.00	653.50	.288	.773
Federal taxation of property transactions	2.00	3.00	693.00	.766	.444
Federal taxation of entities	2.00	3.00	717.50	1.06	.288
Technical skills and Employability skills					
Continuous learning	4.00	3.00	553.50	-.945	.345
Decision-making skills	3.00	3.00	552.50	-.763	.445
Oral communication	3.50	3.00	608.00	-.264	.792
Written communication	3.00	3.00	710.00	.974	.330
Listening attentiveness	3.00	3.00	655.50	.303	.762
Analytical and problem-solving	3.00	3.00	713.00	.999	.318
Critical thinking	3.00	3.00	642.00	.144	.885
Self-motivation/self-direction	3.00	3.00	578.50	-.611	.541
Professional attitude/Professional demeanor	4.00	3.50	548.50	-.994	.320
Teamwork/Group interaction	4.00	4.00	558.50	-.890	.373

Table 3 continued on next page

	Mdn		Test Statistics		
	<i>Audit Career Path</i>	<i>Tax Career Path</i>	<i>Mann-Whitney U</i>	<i>Z</i>	<i>Asymp. Sig. (2-tailed)</i>
Perception of Required Competency					
Computer skills/information technology skills	4.00	4.00	747.00	1.51	.131
Ethical awareness	4.00	3.00	473.50	-1.97	.049
Leadership	3.00	3.00	643.00	.157	.875
Time management and organization	3.00	3.00	620.50	-.114	.909
Research skills	3.00	3.00	669.50	.665	.506
Whole of business approach/interdisciplinary approach	3.00	3.00	601.00	-.358	.721

RESULTS

This study aims to answer the question, "Does a CPA's career path influence their perceptions of both the competencies accounting graduates should possess and the extent to which graduates demonstrate those competencies?" This study will answer this question through the two primary objectives: (1) to determine whether CPAs in specializing in an audit or tax career path hold distinct views on the competencies required for entry into the accounting workforce, and (2) to assess whether these same professionals perceive meaningful differences in how well graduates are demonstrating the attainment of those competencies. This study identified two primary findings regarding the influence of audit or tax career path on CPAs' perceptions of both the *required* and *attained* competencies of accounting graduates.

First, the career path was found to have a minimal effect on CPAs' perceptions of which competencies accounting graduates should possess. Across all competencies examined, 82% showed no statistically significant variation between respondents in audit and those in tax. An analysis of the five overarching competency groups revealed that only three demonstrated any statistically significant differences based on career path. The most pronounced variation was found within the *Regulation* competency group. Four out of six competencies in this category reached statistical significance, suggesting that tax professionals place greater emphasis on these competencies compared to their audit counterparts. This finding aligns with the nature of tax work, which heavily involves regulatory knowledge, such as tax law, compliance, and administrative procedures, which are topics inherently more central to the tax career track. However, auditors also require a strong understanding of regulations and professional standards. The difference may reflect the more specialized and technical nature of tax education, or it may support the new CPA exam structure, which includes a tax specialization track but not an audit specialization track.

The *Business Environment and Concepts* group also showed statistically significant results in two of its six competencies. However, despite achieving statistical significance, the median ratings for these competencies were identical across both career paths, suggesting that the practical implications of these differences may be limited. Finally, within the *Technical and Employability Skills* group, which comprises 16 individual competencies, only one reached statistical significance. This result further supports the conclusion that career path exerts little influence on perceptions of required competencies.

Second, the analysis found that career path had an even weaker effect on CPAs' perceptions of the competencies that accounting graduates have attained. Three of the five competency groups yielded at least one statistically significant result. However, only 10% of the 40 competencies examined within these groups were affected, underscoring the limited impact of career path on these perceptions.

Within the *Business Environment and Concepts* group, two competencies—Information Technology and Operations Management—were rated significantly higher in perceived attainment by tax professionals. This result suggests some variation in how tax CPAs view graduates' preparedness in specific operational areas. In the *Financial Accounting and Reporting* group, the Financial Transactions competency reached statistical significance despite audit and tax respondents reporting identical median scores, indicating a potential anomaly in the distribution or interpretation of responses. Lastly, within the *Technical and Employability Skills* group, only one competency showed a statistically significant difference, with audit professionals assigning a higher median rating for the competency Ethical Awareness than their tax counterparts.

Taken together, the findings suggest that a career path has a limited and largely inconsistent impact on how CPAs perceive both the competencies that accounting graduates should possess and those they have attained. While a few differences emerged—particularly in areas aligned with each path's functional focus—most competencies were perceived similarly regardless of professional background. These results suggest a broadly shared view among CPAs regarding the skill sets essential to new accounting graduates, regardless of whether the respondent works in audit or tax.

LIMITATIONS

Our study is subject to several important limitations that may affect the interpretation and generalizability of the findings. First, the relatively small sample size of 72 respondents may limit the extent to which the results can be generalized to the broader population of CPAs. Smaller samples reduce statistical power and increase the margin of error, making it more difficult to detect subtle effects (Remler & Van Ryzin, 2022). Second, the low response rate of 7.27% raises the possibility of nonresponse bias. Individuals who chose to participate may systematically differ from those who did not. This difference may be due to their varying views, experiences, or familiarity with accounting education, thereby introducing sampling bias into the study. Third, the study may be affected by measurement bias stemming from limitations in the survey instrument or question design. For instance, respondents may have interpreted competency definitions differently, or the Likert-scale format may not have fully captured the nuance of their perceptions. Such issues can compromise the reliability and validity of the results (Remler & Van Ryzin, 2022). Despite these limitations, the study offers valuable initial insights into how a career path may (or may not) impact CPAs' perceptions of accounting graduates' competencies. Future research using larger, more diverse samples and validated measurement tools could help confirm or refine these findings.

DISCUSSION

Previous research has found that many accounting graduates are entering the workforce without the necessary competencies for professional success (Richardson, 2020; Sandifer, 2018). Despite ongoing efforts to define essential competencies, accounting oversight bodies, educators, and employers remain divided on whether universities are graduating students who possess the skills required for both CPA eligibility and professional employability (AICPA, 2021, 2022; Dawkins, 2023; Dawkins & Dugan, 2022; Pasewark, 2021; Richardson, 2020; Sandifer, 2018). Some scholars have suggested that a CPA's specific career path, such as audit or tax, may influence their perceptions of which competencies accounting graduates should possess (Richardson, 2020). However, this study found little evidence to support a meaningful difference based on career path.

Notably, the AICPA's latest data show an uptick in hiring individuals without accounting degrees, indicating that practical competencies are increasingly being valued over traditional academic preparation (AICPA, 2021a). This trend underscores the need for educators and governing bodies to clearly define essential competencies and intensify efforts to attract and retain future accounting professionals (Dawkins, 2023). Building on this trend, the findings of this study indicate that a CPA's career track—whether in audit or tax—has minimal influence on their assessment of graduates' competency attainment, reinforcing the need for a unified competency framework across the profession.

In addition, this study supports ongoing calls from educators, governing bodies, and employers to clearly define the competencies most relevant to the modern accounting workforce (Dawkins, 2023; Dawkins & Dugan, 2022; Pasewark, 2021). The CPA Exam's recent overhaul exemplifies continued joint efforts by key stakeholders to align licensure requirements with the evolving competency expectations of the accounting profession. This study further demonstrates that career specialization has a minimal impact on how required competencies are perceived, allowing stakeholders to focus on defining a core set of competencies that transcends specific career tracks. Consequently, educators can prioritize teaching universally relevant competencies, as the specific career track students pursue does not significantly impact their ability to acquire those skills.

CONCLUSION

This study provides timely and practical insights into how career specialization—specifically within audit and tax—shapes CPAs' perceptions of the competencies that accounting graduates should possess and are perceived as having attained. Contrary to some earlier assumptions in the literature, the findings demonstrate that a CPA's area of practice has only a limited and inconsistent influence on these perceptions. Most competencies, both required and attained, were viewed similarly across career paths, suggesting broad professional consensus regarding the core skills expected

of new graduates. This shared perspective underscores the viability of a unified, competency-based framework that can guide accounting education and licensure standards without requiring extensive customization based on career track. As firms increasingly hire non-accounting graduates who exhibit the necessary skills, the pressure on accounting programs to adapt is intensifying. These results equip educators, licensing bodies, and policymakers with evidence to support the development of standardized curricula that emphasize universally relevant competencies, helping to better prepare students for the profession while addressing the urgent workforce shortage. Future research should build on these findings using larger and more diverse samples to further validate the consistency of competency perceptions across various public accounting roles and regional contexts.

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Designing a Leveling Course in Business Analytics for an MBA Program

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ABSTRACT

This paper details the steps one university took to create an appropriate leveling course in business analytics for a general MBA program. MBA students enter the program with varied backgrounds and inconsistent preparation in analytics. A survey of the faculty teaching in the MBA program along with best practices from a literature review guided curriculum development for this course. The course covers descriptive, predictive, and prescriptive analytics along with visualizations and software tools to perform these analytical computations. Special topics, which align with current industry practices, are also addressed to prepare students for modern industry demands in the data analytics arena. Student end of course surveys, faculty reflection, along with current and emerging technologies will be utilized to modify and improve the course in future iterations.

Keywords: MBA, analytics, pedagogy

1. INTRODUCTION

The demand for business analysts, data analysts, data scientists, data curators, and other data related jobs has been skyrocketing over the past decade (BLS, 2024). In response to industry demands, the academic community has been creating certificates, baccalaureate degrees, master's degrees, and other programs in data related fields. This paper addresses the development of a leveling course for a general MBA program at a medium-sized US university. A leveling course is defined as:

A course that provides a summary or overview of all the core subjects associated with a program of study. The course provides a comprehensive review of all the foundational material associated with the degree program (Husson, 2024, para. 1).

The MBA faculty identified an analytics weakness to the MBA committee. This weakness materialized in individual courses (accounting, finance, economics, marketing, operations management) in the MBA, necessitating analytics reviews for the students before continuing with the course topics. The students entering this MBA program come from a myriad of backgrounds (BA, BBA, BS, MS, with only 4% of the 2023-24 cohort having a course specific to business analytics on their transcript) showing the need for a leveling course in business analytics. This leveling course covers data literacy, data extraction, data cleaning, descriptives, regressions, and visualizations (the core components of a one-year undergraduate course sequence in business analytics) along with special topics related to data handling in current business settings. These topics were selected based on a literature review and a survey of the MBA faculty. This leveling course gives the MBA faculty, who illustrated the analytics deficiency in their MBA students, a foundation upon which to build discipline-based analytics while teaching their individual courses. This leveling course is a first-year requirement of all entering MBA students. This course also exposes the students to the modern software tools of the business analyst, for example, Excel, Power BI, and Tableau. The purpose of this study is to design, implement, and justify a business analytics leveling course for a general MBA program based on faculty needs and an industry-demand literature review.

2. LITERATURE REVIEW

Descriptive, Predictive, and Prescriptive Analytics

Many authors advise teaching analytics of some sort in the MBA curriculum (Warner, 2013; Paul & MacDonald, 2020; Delen, 2021; Diamant, 2024; Pan, et al., 2024) as a response to industry needs. This is reinforced by the projected growth rate of data related jobs and the number of graduates in data fields as shown in Table 1 (Pierson, 2023; BLS, 2024).

Table 1: Data on data analytics and data science degrees granted and job growth

Topic		2020	2021	2022
Number of Master's Degrees Awarded	New Data Science CIP Code	160	271	1208
	Number of Universities Awarding	13	17	41
	New Data Analytics CIP Code	344	530	2889
	Number of Universities Awarding	15	20	49
Projected Job Growth Rate	35%	2023 Median Salary		\$108,020

The central theme for analytics in the MBA curriculum centers around descriptive, predictive, and prescriptive analytics along with data visualizations. The primary platform identified in the literature is Excel (Diamant, 2024; Pan, et al., 2024). Multiple reasons are presented, including the ubiquity of Excel in the business environment (Gupta, 2015; Al-Haddad, et al., 2019) and the ease of data entry in an Excel environment (Al-Haddad, et al., 2019).

Curriculum Development

Academics are concerned with curriculum models for analytics programs, course structure and sequencing, and aligning curriculum with current and emerging industry needs. Baccalaureate programs, master's programs, as well as undergraduate and graduate certificates have curriculum guides published in the literature (Paul & MacDonald, 2020; Bačić, et al., 2023; Danyluk & Leidig, 2021; ACM & IEEE, 2020). Skills assessment and analysis of industry needs for recent university graduates have been performed (Stanton & Stanton, 2020; Dong & Triche, 2020; Radovitsky & Hegde, 2022) and a comparison between curriculum and industry needs was illustrated by Dong and Triche (2020). Many of these papers involve survey research, either a survey of faculty, program curriculum, job postings, or course topics posted online.

Bachelor's and Master's Programs

The curriculum model committee headed by Danyluk and Leidig (2021) discussed the knowledge areas (KAs) a data science graduate should have at their disposal. The list is computing focused with KAs in presentation and visualization; programming, data structures and algorithms, and computing and computer fundamentals. They also recommend KAs that would be applicable to all areas of data (scientist, analyst, curator) such as data mining, data privacy, security, integrity, and analysis for security, along with data acquisition, management, and governance. Paul and MacDonald (2020) structure their model as an “analytics road map” that has six areas to master:

1. Prerequisites – Microsoft Office, general mathematics and statistics preparation
2. General Business Skills – Communication and leadership
3. Analytics – Descriptive, predictive, and prescriptive
4. Software – Software recommendations for analytics
5. Electives – Courses to establish a mastery area (healthcare, risk management, geospatial)
6. Experiential – Practicum, internship, or capstone project

Both curriculum models illustrate the synergy between computing and analytics. In fact, the tie-in between the two fields is so great that Urbaczewski and Keeling (2019) wrote about MIS departments transitioning to Analytics departments. A timeline is presented in their work that would describe the current state of analytics as in its third metamorphosis.

Undergraduate and Graduate Certificates

Answering the demands of industry for more data professionals, Clayton and Clopton (2018) created a four-course sequence that rewards the student with a certificate in data analytics. The courses selected:

1. Introduction to Data Analytics
2. Principles of Data Communication and Visualization
3. Applications of Data Analytics
4. Analytics Capstone

align with the more general model of Paul and MacDonald (2020) discussed in the previous section.

In the graduate arena, Bačić, et al. (2023) redesigned an existing certificate to include redesigned elective courses around the existing data and database systems classes. These redesigned courses updated the Data Analytics Graduate Certificate to include courses in visualization, econometrics, analytics, forecasting, programming, and a domain specific elective. After the renaming of the certificate and the refreshing of the elective courses, their department has experienced a four-fold increase in the number of certificates awarded during the seven-year reporting period.

Evaluating Curriculum versus Industry Needs

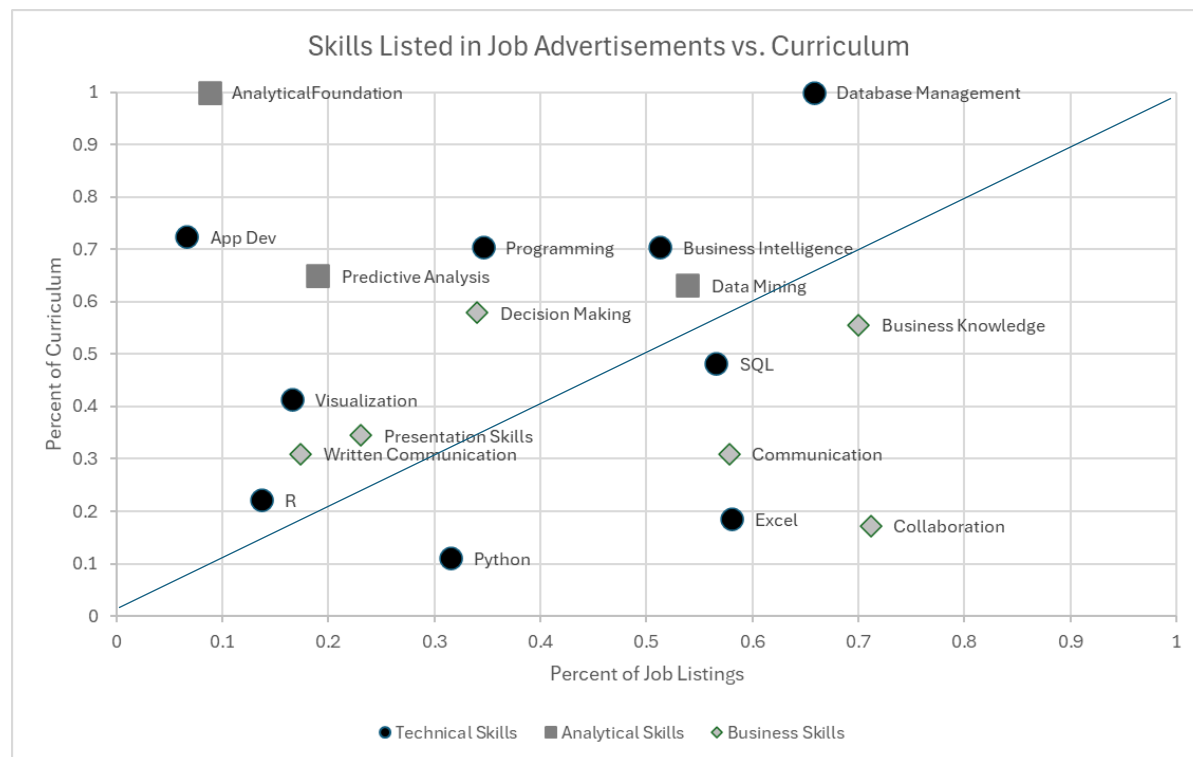
Alignment of curriculum should involve standardized curriculum models, advisory boards, and industry needs surveys. Dong and Triche (2020) compared curriculum mentions of key words to job posting mentions of the same key words. The top five results from each are given in Table 2.

Table 2: Top five job posting versus curriculum mentions of key words

Job Posting	Curriculum
Excel	Programming Skills
Database Management	Database Management
Business Knowledge	Application Development
Communication	Foundation
Collaboration	Predictive Analytics

A visualization of the dataset is given in Graph 1 and illustrates the differences between what employers' desire in an entry-level candidate and what university curriculum from business analytics and data science programs advertise in curriculum documents (Dong & Triche, 2020). Dong and Triche's comparison table is illustrated in Graph 1 where points above the $y = x$ line indicate skills that appear more often in the curriculum than in job advertisements, while those points below indicate skills employers desire that are lacking in the curriculum documentation. The legend indicates skill categories as defined by Dong and Triche (2020).

Graph 1: Job posting versus curriculum mentions of key words



Another study (Stanton & Stanton, 2020) identifies “four broad categories of skillsets for analytics professionals” (p. 148) from the literature review and findings in their research. These categories, with examples, are:

- Credentials – degrees, prior experience, certifications
- Hard Skills – data analysis, programming, data visualization
- Soft Skills – communication, teamwork, problem solving
- Software Skills – Python, SQL, R, Excel, Tableau

These skills also appear in Graph 1, connecting the two studies’ results. Stanton and Stanton (2020) go on to illustrate the cross-disciplinary nature of data studies by presenting a jobs list harvested from LinkedIn on April 20, 2019, with position titles like data science, data analytics, healthcare analytics, social media analytics, retail analytics, and HR/talent analytics (plus more). This list of seventeen job types from across the business analytics spectrum listed 533,062 jobs with 143,929 (27%) listed as entry level jobs. These results make the point that “data is, and for the foreseeable future, will continue to be, one of the most significant disruptive forces in worldwide commerce” (Stanton and Stanton, 2020, p. 138). Analytics and analytics jobs are appearing across the business spectrum as businesses attempt to use the massive amounts of data they collect to improve processes and cut costs.

The topic of analytics in the curriculum (Bachelor’s, Master’s, Certificates and Minors) has been well-documented. However, a general outline of what MBA students need as an analytics leveling course has not. This research proposes a course structure that will prepare MBA students with the ability to incorporate analytics into their coursework throughout their time in the MBA program. By incorporating the major skillsets desired by industry into the curriculum, the students will benefit from seeing analytics used in their MBA courses (operations management, human resources, finance, economics, accounting, marketing). The students will also gain a thorough understanding of where analytics can be deployed in the business ecosystem.

3. METHODOLOGY

Through student requests, faculty conversation, and advisory board feedback, the business school at a medium-sized public university identified the need for a foundational course in business analytics for the MBA program. Faculty teaching in the program found that entering MBA students did not have the same level of analytics preparation.

Business Analytics

With any emerging discipline it can take some time for terminology to evolve and the area of “analytics” within business is no exception. For years, the terms ‘business intelligence’ or ‘informatics’ were common but since the late 2010’s, terms such as ‘data analytics’ and ‘business analytics’ continue to be more common amongst higher education programs. Current research suggests that these are subdisciplines of the data and management science disciplines, but much disparity is still found throughout university degree programs (Power et al., 2018).

For the purpose of this paper, business analytics involves the use of statistical analysis, data mining, and predictive modeling to transform data into actionable insights that inform business decisions. It focuses on leveraging data to improve business processes, enhance decision-making, and drive strategic initiatives (Galit & Peleg, 2023). The course proposed for the MBA program will be aligned with and follow the spirit of business analytics.

To begin the study, a survey was deployed (via email) to faculty teaching in the MBA program which identified skills that the faculty would like all students to have when entering their class. The survey listed skills identified in Dong and Triche (2020) with a yes/no response indicating whether the faculty would or would not use these skills in their MBA classes. Part of the survey was open-ended to enable the faculty to decide what skills they desire in students and what skills would be necessary for the appropriate deployment of analytics in their MBA course. Key words were selected from the open ended response questions, and a Pareto chart was built to display the most frequent results and to aid in discussions with the MBA faculty. The results from the six faculty teaching in the MBA program are given in Table 3.

Table 3: Survey results from MBA faculty

Topic	Percent of Respondents
Critical Thinking	100%
Excel Skills	83%
Predictive Analytics	67%
Data Cleanse	67%
Data Visualization	33%
Data Scrape from Web	33%
Cluster Analysis	33%
Data Driven Decision Making	33%
Text Mining	33%

From these results, which aligned with topics identified in the literature review, the analytics faculty put together a topical course outline and proposed it to the MBA faculty. The resulting outline is given in Table 4 for a 16-week semester.

Table 4: Proposed topics, tools, and SLO's for Business Analytics

Topic Area (Weeks to Cover)	Tools Needed	Student Learning Outcomes (SLO)
Data Types Nominal, Ordinal, Interval, Ratio (1)	Internet Excel	Define the data types used in business analytics
Data Acquisition (2)	Internet Excel	Locate, select, and import data in various formats and from varied sources
Data Cleansing (2)	Excel	Demonstrate the ability to cleanse data sets using appropriate methodologies
Data Visualization Descriptive Statistics Hypothesis Testing (3)	Excel Tableau	Demonstrate the ability to generate meaningful visualizations utilizing business data
Predictive Analytics Time Series Multiple Regression Logistic Regression (3)	Excel Real Statistics* Tableau	Demonstrate the ability to utilize predictive analytics for business forecasting
Cluster Analysis (2)	Excel Real Statistics* Tableau	Demonstrate the ability to perform and interpret cluster analysis in a business application
Text Mining (1)		Recommend appropriate uses for text mining for business applications
Machine Learning (0.75)		Recommend appropriate uses for machine learning for business applications
Artificial Intelligence (0.75)		Recommend appropriate uses for artificial intelligence for business applications
Ethics (0.5)		Demonstrate the ability to make ethical decisions concerning data acquisition, data cleansing, data analysis, and data visualization
Total Weeks (16)		

*Real Statistics is an add-in to Excel available at: <https://real-statistics.com/>

In addition to the topics listed in Table 4, each module should emphasize:

- Excel usage and skills
- Critical thinking – making sense of the data, data manipulations, and results to include:
 - Produce meaningful results in the business context
 - Present clear and concise findings in the business context
 - Answer questions about the data in the business context,

enhancing the skills required in industry job postings (see Graph 1), and reinforcing the skills gaps identified in Pan, et al. (2024). Assessment of the analytics skills will be attempted, via a survey of the MBA faculty, after two years, when the initial cohort of students completes (or is near completion) of the MBA to evaluate if the new analytics course had an impact on teaching and learning in the MBA program.

The last three weeks of the course will be reserved to discuss ideas surrounding emerging techniques and tools for data analysis. The objective of these “current topics” is to make the students aware of topics they might utilize in the modern enterprise. These advanced topics are not for the general MBA graduate to become proficient at, that would be for the graduate analytics student, but to give the general MBA student a window into the possibilities of data management and data usage in the modern enterprise. It is expected that these current topics will change as industry embraces new techniques in the future. Now, all students take the MBA leveling course “Business Analytics” in their first year of study in the MBA program.

4. RESULTS

In general, many MBA program students are employed full-time, necessitating an educational framework that optimally supports their professional growth. A critical aspect of program design involves aligning courses with both industry demands and student interests. In this paper, we propose and implement such a strategy within the Business Analytics course of the MBA program.

Course Description

Business Analytics: This course provides a comprehensive overview of business analytics with a focus on critical thinking, data acquisition, and data visualization. Students will explore a range of topics including data types, data cleansing, and predictive analytics, using tools such as Excel, Tableau, and Real Statistics. The course covers essential techniques for data visualization, including the creation of meaningful visualizations and dashboards, as well as advanced topics like predictive analytics, cluster analysis, and text mining. Students will learn to utilize these techniques for business forecasting, decision-making, and ethical considerations in data management. Additionally, the course introduces the application of machine learning and artificial intelligence in business contexts. Throughout the course, students will engage in practical exercises involving data modeling, processing, and strategic visual encoding. They will also critically evaluate visualization designs and make informed decisions about visual representation, including color choices and encoding methods.

By the end of the course, students will have developed transferable skills applicable to various data visualization tools and software, preparing them to effectively analyze and present data in a business setting.

Course Learning Outcomes /Objectives

Upon satisfactory completion of this course, the student should be able to:

- Demonstrate foundational data literacy, including data acquisition, cleaning, and preparation.
- Apply descriptive statistical techniques to summarize and interpret business data.
- Construct and interpret basic regression models for business decision-making.
- Design and develop compelling visualizations using Excel and Tableau.
- Communicate data-driven insights effectively through written and visual presentations.
- Utilize analytics to support critical thinking and problem-solving in business contexts.
- Employ basic predictive and clustering techniques to identify business trends.
- Evaluate and apply ethical considerations in the use of data and analytics.

The course has been evolving based on end-of-semester student course evaluations, which consistently show positive feedback. Students reported improved learning and greater engagement as the course incorporated more hands-on tools for business analytics, including Tableau, Power BI, and Excel. In addition, course materials and case discussions were updated to include current AI topics, allowing students to collaborate and explore how AI can impact business analysis. These updates have enhanced student participation and deepened understanding of how to apply analytics in real-world contexts.

To assess learning, we use multiple methods, including hands-on assignments, exams, case analyses, and student projects. These assessments allow us to track both skill development and conceptual understanding and provide feedback that guides ongoing updates to the course content. Overall, the course continues to improve each semester based on student feedback and assessment of learning outcomes, ensuring that students gain both practical skills and conceptual understanding in business analytics and AI applications.

5. CONCLUSIONS

Any course, after running the first time, needs adjustment. Some of the adjustments for the Business Analytics course will be adopted based on discussions with colleagues and faculty in the MBA program, along with watching analytics trends in industry.

Limitations of the study include survey data from a small sample of faculty from a single university and early stage research results with limited post-implementation results. However, in the age of analytics, other colleges and universities can benefit from evaluating the topics presented in the literature review, Graph 1, Table 3, and the syllabus in Table 4 to launch a similar course in Business Analytics for a general MBA program.

It is proposed to survey the faculty in the MBA program in two years (upon program completion of this initial cohort through Business Analytics) to evaluate if the quality of the students' quantitative abilities has improved. For example, are the students now using more visualizations and quantitative results in their MBA coursework? Are the instructors able to move through the baseline quantitative methods more quickly due to the students having completed the Business Analytics course?

Answers to these, and other questions, will form the basis for future curriculum modifications for the leveling course in business analytics for a general MBA program.

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From Classroom to Career: Business Student Perceptions of Internships, Networking, and Professional Organizations

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ABSTRACT

This study examines how business students engage in internships, networking events, and professional student organizations. Survey data from undergraduates, including 42% first-generation students, revealed low internship completion, though most students who interned secured or expected job offers. Student club participation was more common. First-generation students attended more networking events, but this yielded the same resulting internship and job offers as peers. Students rated networking events and faculty as the most helpful search resources, with parents being rated as less helpful for first-generation students. Students cited scheduling challenges, low pay, and difficulty finding relevant opportunities as key barriers. Despite valuing career services, few had visited the campus center. Findings highlight benefits and challenges of typical business career preparation strategies.

Keywords: career readiness, internships, networking, professional skills, first-generation students

INTRODUCTION

Internships, networking events, and student organizations are links between academic learning and professional growth. When well-structured, these practices support career exploration, build networks, and enhance employability – a finding especially influential in business programs, where internships are often embedded into major requirements (Gault et al., 2000; Playter & Burkhardt, 2024). Mentorship—through faculty or industry partners—helps students navigate professional norms (Goodman & Kooner-Evans, 2024). Internships, in particular, provide hands-on experience (Rothschild & Rothschild, 2020). However, access, quality, and support differ widely, affecting first-generation and continuing-generation students in ways that carry implications for the business education landscape.

With guidance from accreditation expectations and employer feedback, business schools often encourage or require students to participate in experiential learning opportunities designed to develop professional competence and workplace readiness. Understanding how business majors navigate these opportunities—along with the barriers that deter engagement—is essential for improving advising structures, course designs, and institutional supports.

Guided by these concerns, this study examines business students' engagement with key professional preparation activities at a small private university in the southeastern United States. To frame the analysis, the study investigates four research questions:

- (1) To what extent are business students influenced by their parents when choosing a career path?
- (2) How do business students perceive career-related clubs?
- (3) What are business students' views on internships?
- (4) How do business students perceive networking events?

LITERATURE REVIEW

Studies consistently demonstrate the career advantages of internships. Gallup poll results find that 41% of college students complete an internship while seeking a bachelor's degree (Marken & Curtis, 2023). Well-designed, guided internships that align with student interests and include structured reflection are most impactful, improve student job acquisition, and correlate with higher post-college pay (Mijs & Girgin, 2024; Hora et al. 2019; Maertz et al. 2014). Soft skill development is another benefit: networking, professional memberships, cross-sector connections, career support, cross-cultural adaptability and transformative relationships (Bowser et al., 2024). Arellano-Bover et al. (2024) found that internships emphasizing social and collaborative skills boosted callback rates for graduates. Remote and hybrid internships enhance digital fluency, adaptability, which are competencies valued by employers (Ortiz, 2023; Wu et al., 2024; Kaplan, 2023). Hybrid internships are no less impactful than onsite internships (Hoyt & Jones, 2023).

Beyond internships, student organizations and networking events also shape professional identity. In business schools, student organizations often align with functional areas such as accounting, finance, or marketing. Participation fosters career clarity, confidence, social connections, and employability while lowering professional anxiety (Jackson & Tomlinson, 2021; Kemp et al., 2020; Bridgstock et al., 2019; Buff & O'Connor, 2012). Mandatory preparation programs can embed career norms (Clark, 2005), and involvement in clubs or competitions signals proactive career behaviors, particularly among graduating and professional school students (Opsata, 2020).

Barriers to Student Participation

Participation in internships, student organizations, and networking events among business students face four primary barriers: financial constraints, time pressures, limited institutional support, and perceived low value. Financial challenges are especially restrictive. Frenette and Frank (2016) noted that students at tuition-dependent schools often cannot afford unpaid internships, particularly without institutional backing. Similarly, Rajan and Saraf (2024) highlighted how competition for opportunities leads to disengagement. A digital divide compounds these issues, with lower-income and rural students facing reduced access due to technological or geographic limitations (Rothman & Sisman, 2016).

Institutional gaps further undermine engagement, especially at small schools. Reduced faculty advising and sparse mentoring networks provide students with less professional guidance. Poorly designed programs can weaken learning outcomes (Jackson, 2014). Faculty managing heavy teaching loads struggle to offer robust mentorship (Bullen et al., 2018). Davis and Binder (2016) cautioned that career center partnerships often direct students toward a narrow band of corporate recruiters, restricting broader exploration. Time constraints also deter participation. Wolfgram et al. (2020) found that many students' off-campus work interferes with internship schedules. Balancing coursework with extracurricular and experiential activities often limits involvement (Tatum, 2021).

Perceived low value in participation is another deterrent. Munoz et al. (2015) found students are more likely to remain active in organizations that deliver skill-building, professional exposure, and entrepreneurial experiences. Underperforming clubs see declining membership. Many students question the return on investment of professional events, especially absent peer role models or incentives (Finch et al., 2013). Yet professionalism remains a key competency employers seek (Cojanu et al., 2022). In campus settings where internships or networking lack cultural normalization, students may conclude such activities are “not for them” (An & Loes, 2023). Parveen and Mirza (2012) observed that many students perceive internships as administrative requirements, not growth opportunities.

First-generation business students often encounter heightened obstacles. National data shows a gap between first-generation students who complete an internship (27%) and their peers (49%) (Marken & Curtis, 2023). They frequently lack guidance on internship timing or application processes (Ricks & Warren, 2021; Phillips et al., 2020), and need targeted strategies to navigate limited resource awareness (Girardan, 2024). Cultural mismatch, underrepresentation, work-study conflicts, and a preference for interdependence can all dampen participation (Phillips et al., 2020; Castellanos, 2015). Many first-generation students report gaps in academic confidence, procedural knowledge, and family support (Ricks & Warren, 2021). However, Jemini-Gashi et al. (2021) showed that students with strong family backing are more likely to pursue experiences aligned with long-term goals. Parental advice often shapes engagement (Nichols & Islas, 2016).

Together, these findings suggest that overcoming participation barriers requires multifaceted solutions—financial aid, flexible scheduling, stronger faculty support, and campus encouragement of career-readiness. Career-focused curricular changes can boost student confidence and preparedness (Amoroso & Burke, 2018), while structured mentorship and clear alignment with labor market needs offer additional support (Wang, 2024).

METHODOLOGY

The literature confirms that internships, career-focused clubs, and networking events benefit students by offering structured ways to gain practical experience, build professional connections, and enhance employability. However, student participation is not universal. Within business programs—where experiential learning is often embedded in career preparation culture—understanding these patterns is particularly relevant. This study examines how business students engage, with comparisons between first-generation and continuing-generation students.

Data were collected via a convenience sample at a small private university in the southeastern United States during fall 2025. The university's Research Review Board approved the study. Professors in several business courses invited

students to voluntarily complete an online Qualtrics survey. Participation had no effect on course grades, and students could skip any questions without penalty. The usable response rate was 21.5%, from $N = 122$ of 565 potential participants. First-generation students represented 41.6% of respondents. The sample was comprised of 7.9% freshmen, 20.8% sophomores, 35.6% juniors, and 35.7% seniors, with 81.2% U.S. residents and 18.8% international students. Only 5% were majoring outside the School of Business.

Most respondents were traditional-age students (18–23), potentially skewing participation levels compared to other campuses. Younger students often have fewer external obligations and more access to campus resources, whereas older students—though more likely to engage when internships are paid or flexible—face employment and caregiving barriers (Gilliland, 2025; Bickett, 2023). This age distribution is typical of undergraduate business programs at small institutions, but it may limit generalizability to adult-learner or part-time business populations.

RESULTS

Family Influence

The first research question explored family influence on career choice. Overall, 34.2% of students pursued a profession where a family member currently or previously worked. First-generation students were more often entering new fields, with 72.7% reporting no family ties to their chosen profession versus 60.9% of continuing-generation peers (see Table 1A). However, chi-square tests showed no statistically significant differences (all $p > .37$). When asked if a parent's career influenced their path (Table 1B), continuing-generation students were more likely to follow a similar direction ($\chi^2(1, N = 101) = 3.07, p = .080$), while first-generation students more often reported no influence at all, ($\chi^2(1, N = 101) = 2.89, p = .089$). These modest differences indicate that first-generation business students may chart professional paths with fewer inherited industry ties, affecting the type of networks they access.

Table 1. Indicators of family influence

1A. Family member in a profession related to student major?				
Response	All	First Generation	Family graduates	
A family member is currently in this line of work.	23.1%	18.2%	26.6%	
A family member was previously in this line of work.	11.1%	9.1%	12.5%	
None.	65.7%	72.7%	60.9%	
1B. Family member influence on choice of career path?				
Response	All	First Generation	Family graduates	
Yes, I want to do something similar to a parent.	13.3%	4.9%	19.3%	*
Yes, I want to do something different than a parent.	11.2%	9.8%	12.3%	
No influence.	75.5%	85.4%	68.4%	*

*Note: Values represent the percentage of students who selected the response option. Statistical significance is marked at the 1% (***) , 5% (**) and 10% (*) levels.*

Club Participation

The second research question examined professional student organizations. Participation was evenly divided: about half were current (43%) or former (8%) members of at least one major-related club, while 49% reported no involvement. There was similar involvement across first-generation and continuing-generation students ($\chi^2(2, N = 122) = 0.20, p = .904$). Students most often joined clubs for networking, followed by learning about their major, connecting with peers, and gaining leadership experience. Another chi-square test found no significant differences in these motivations by background, suggesting comparable reasons for participation. This aligns with Munoz et al. (2015), who also reported that first-generation status did not predict membership in professional organizations.

All respondents, regardless of membership, ranked reasons for not joining clubs. The most cited barrier was meeting times, followed by low appeal of activities, membership costs, and perceived limited job benefits. Independent samples t-tests showed no significant differences between first-generation and continuing-generation students in these rankings, with p-values from .343 to .949.

At this School of Business, the largest organization was FALP (Finance & Accounting Leaders and Professionals), followed by the Investment Club and the AMA (American Marketing Association) chapter. Chi-square analyses across seven clubs revealed only one statistically significant difference: first-generation students were overrepresented in ALPFA (Association for Latino Professionals for America), $\chi^2(1, N = 101) = 7.09, p = .008$. Membership in other clubs showed no significant variation by background (all $p > .10$). These results indicate that motivations for joining and reasons for not participating in clubs are broadly shared. There may be affinity-based organizations like ALPFA that particularly resonate with first-generation students.

Internships

The third research question explored business students' views on internships. Internships were less common than participation in clubs: 23% of students had completed an internship, while 77% had not. Among those with internship experience, 45.8% received a job offer and another 29.2% anticipated one. Nearly all internships (91.7%) were paid, with 30.4% also offering a bonus. A series of chi-square tests examined whether internship experiences differed by first-generation status, with no statistically significant differences across seven outcomes. Post-internship job offer outcomes (none, possible, or yes) were similar, as were rates of paid internships. The number of internships completed (zero, one, two, or more) was comparable. Plans to pursue future internships also showed no differences. These findings suggest that internship participation, compensation, and related outcomes were comparable between first-generation and continuing-generation students within this sample (all $p > .10$). This contrasts with national trends in business education, where first-generation students typically participate at lower rates. Here, contrary to national patterns, first-generation business majors accessed internships at similar levels and with similar compensation.

All respondents were asked to rank reasons for not completing an internship. Difficulty finding a relevant internship was the top obstacle, followed by low pay (see Table 2). Independent-samples t-tests comparing mean rankings showed no statistically significant differences between first-generation and continuing-generation students, with p-values ranging from .189 to .905.

Table 2. Reasons for lack of internship completion

Response	Average ranking
Difficulty in finding a relevant internship	2.5
Low hourly pay from an internship	3.8
Legal or sponsorship requirements for non-US students	4.4
Low helpfulness of internships in finding a job after graduation	4.8
Transportation to the internship site	5.0
Housing for summer internships	5.3
Minimum GPA requirement	5.5
Tuition for academic internships	5.6
Other	8.1

Note: Respondents ranked reasons from 1 (most likely reason) to 9 (least likely reason).

Students frequently seek internship advice from faculty during class or advising. The survey asked how helpful various resources were when searching for internships. "Meet the Firms" and networking events ranked most helpful, followed by faculty then social media and online sources (see Table 3). Independent-samples t-tests indicated statistically significant differences: students from college-educated families rated parental help more highly than first-generation students ($t = 2.93, p = .005$) while first-generation students rated classmates slightly more helpful ($t = 1.88, p = .071$).

The survey explored how useful students would personally find various professional support. Job placement assistance after graduation was most valued, closely followed by internship placement and networking events (see Table 3). All items were rated more helpful on average by first-generation students. Two items had statistical significance at the 10% level: mock interviews ($p = .071$) and networking events ($p = .093$). This suggests first-generation students have less confidence in professional interactions, an area where universities might focus support. Despite viewing these services as helpful, 68% of students had zero visits to the university's Career Services office.

Table 3. Helpfulness of professional support resources

Response	Average ranking	First generation	Continuing generation	
Job placement assistance for after graduation	1.55	1.51	1.57	
Internship placement assistance	1.57	1.50	1.62	
Networking and recruiting events	1.57	1.43	1.67	*
Feedback on cover letter and resume writing	1.74	1.64	1.81	
Mock interviews	1.98	1.81	2.11	*
Access to the Handshake portal	2.42	2.29	2.53	

Note: Ratings utilized a four-point scale ranging from most helpful (1) to not helpful (4). Statistical significance is marked at the 1% (***), 5% (**) and 10% (*) levels.

Networking Events

The fourth research question explored student perceptions of networking events. These events were widely viewed as helpful: 14.9% attended one, 39.6% attended multiple, while 45.5% attended none. Among all respondents, 18.2% secured internship offers and 9.3% received job offers through networking contacts. Chi-square tests assessed whether experiences differed by student background. Only one variable showed a statistically significant difference: first-generation students were more likely to attend multiple events, $\chi^2(2, N = 99) = 7.92, p = .019$. No differences emerged in the host organizations of events, internship offers from networking, or job offers at graduation. While first-generation students participated more, the immediate career outcomes were similar across groups.

DISCUSSION AND CONCLUSION

This study examined business students' participation in internships, professional organizations, and networking events at a small private university. Findings offer insight into how students engage with career development and highlight obstacles. Results should be interpreted cautiously given the modest, single-institution sample and potential response bias; broader studies could verify these patterns across universities. Nonetheless, the study contributes to business education scholarship by providing institution-level evidence about how business majors—particularly first-generation business students—engage with professionalization activities central to business school curricula and employer expectations.

Club membership was common, with 51% reporting current or prior involvement. Students joined for networking, major exploration, and leadership, with motivations similar across backgrounds. However, first-generation students were notably overrepresented in ALPFA, hinting at alignment with identity-based missions. Networking event attendance showed comparable trends: over half attended at least one event, and first-generation students were more likely to attend multiple events ($p = .019$)—contrary to national research on participation gaps. Despite this, related job or internship offers were similar. Internships were less prevalent than club membership, completed by 23% of students. Nearly half of interns secured job offers, and most internships were paid. No significant differences emerged by generation in internship participation, pay, academic credit, or outcomes. While this business school has an overall internship participation rate below the national average, its gap between first-generation and other students is insignificant.

Students identified barriers like scheduling conflicts, low pay, and difficulty finding suitable opportunities, echoing prior research on logistical deterrents (Wolfgram et al., 2020; Barkley, 2019). Networking events and faculty were viewed as the most helpful. First-generation students leaned more on classmates and rated parental support lower, reflecting known differences in social capital (Jemini-Gashi et al., 2021; Nichols & Islas, 2016). Despite valuing professional services, most students had never visited the career center.

Taken together, the results suggest that business students value career preparation opportunities but face practical barriers that limit participation. There are actionable strategies to consider.

- **Integrate career preparation into required business courses.** Embedding résumé workshops, networking assignments, or internship searches into introductory business courses may increase engagement. Such integration aligns with accreditation standards emphasizing applied learning.

- **Normalize networking within the business curriculum.** Business programs might increase yields to networking through structured networking labs, guided reflection assignments, or employer partnerships embedded in class projects.
- **Strengthen faculty advising capacity.** Business schools could strengthen faculty-development initiatives to improve advising on internships, industry expectations, and recruiter pipelines.
- **Expand flexible and hybrid internship options.** Difficulty finding relevant internships—combined with scheduling barriers—indicates demand for remote and hybrid internship pathways, micro-internships, or part-time placements.
- **Improve visibility and usability of career services.** Programs could consider classroom visits, embedded peer career mentors, and/or first-generation–focused career workshops.
- **Support affinity-based business organizations.** Institutions can increase funding for affinity-based clubs, connect these organizations to employer networks, and encourage partnerships with business advisors.
- **Expand employer partnerships beyond traditional recruiters.** This may reduce reliance on narrow corporate pipelines.

Within business education—where professionalization is a defining feature—undergraduate participation has implications for student success, employer readiness, and accreditation expectations. As most barriers identified were practical rather than attitudinal, addressing logistical concerns may boost participation.

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“Pop” Goes the National Debt? An Experiential Learning Activity for Teaching Fiscal Policy Challenges

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ABSTRACT

This paper expands upon a balloon demonstration first described as a teaching tip by Geerling et al. (2017) to help students understand the potential pitfalls of a large national debt. Much like the national debt, a balloon can continue to expand, but unless actions are taken to shrink the size of the balloon, it will grow too large and eventually pop. We provide a detailed lesson plan that utilizes a classroom demonstration and a series of follow-up questions to illustrate the complexities involved in reducing the national debt. If a nation doesn't get its debt under control, it could pop, leaving a broken economy. This interactive activity is perfect for high school students, principles of macroeconomics courses, personal finance classes, upper-level courses in public policy and public finance, as a discussion prompt for first-year students in MBA programs.

Keywords: debt, debt-to-GDP ratio, deficits, discretionary spending, fiscal policy, mandatory spending, national debt, revenue, spending, taxation.

INTRODUCTION

As of February 2025, the United States' national debt ticked over \$36 trillion, translating to approximately \$107,000 per American citizen. In a 2024 survey of national debt by country conducted by World Population Review, the United States was among the most indebted nations in the world, coming in at #12 with a debt-to-GDP ratio of 121%. The United States debt-to-GDP ratio has more than doubled since the turn of the century. This escalation can be attributed to several factors. First, chronic budget deficits, where government expenditures consistently exceed revenues, require borrowing to bridge the fiscal gap. Second, significant spending on entitlement programs such as Social Security and Medicare, along with substantial defense expenditures, contribute markedly to federal outlays (Heil 2019). Third, economic downturns and crises further exacerbate the debt through increased government spending aimed at stimulating recovery from the Great Recession and more recently, the COVID-19 pandemic (Faria-e-Castro 2021).

Addressing the national debt presents a complex challenge due to intertwined political, economic, and social factors. Politically, there is often a lack of consensus on implementing spending cuts or tax increases, as such measures can be unpopular among constituents. Rapid debt reduction may risk stifling growth, especially if spending cuts impact critical public services or infrastructure investments. Socially, reforms to entitlement programs often face resistance, given their importance to many Americans' well-being (McBride et al. 2023).

The consequences of inaction are severe. Since the early 2000s, the United States has faced multiple debt ceiling impasses, reflecting ongoing political debates over federal spending and national debt. The debt ceiling, established in 1917, caps the amount the federal government can borrow to meet its financial obligations (Clarke 2024). Raising or suspending this limit requires congressional approval, often leading to partisan conflicts. In 2011, the political brinkmanship prompted Standard & Poor's to downgrade the U.S. credit rating from AAA to AA+, citing concerns over governance and fiscal policy (Wirz 2025). In 2013, disagreements over the Affordable Care Act and federal spending led to a 16-day government shutdown (Kasperowicz 2013). The threat of potential default if the future debt ceiling is not raised have hovered over Washington DC since the post-COVID pandemic. The U.S. debt ceiling, which had been suspended in June 2023, was reinstated at \$36.1 trillion on January 2nd, 2025. Congress has a few months at best to find a solution to its debt ceiling dilemma if the worst-case scenario – a quadrumvirate of further downgrades to the U.S. credit rating, rising interest costs to service debt, another government shutdown and a prolonged recession – are to be avoided.

The topic of federal deficits and national debts can be dry, abstract and difficult for students to comprehend. First, students need to understand the nexus between deficits and debt: that persistent budget deficits add to the national debt. This paper builds on the work of Geerling et al. (2017) who present a balloon demonstration as a memorable

way to visualize expanding debt. A roomful of balloons that are just about ready to pop is a great metaphor to convey the immediacy of the debt problem to students – and the need to find non-partisan long-term solutions.

We begin by surveying the economic education literature on the National Debt. From there, we develop an interactive lesson plan that makes the debate about the national debt visceral. Lastly, we offer concluding remarks.

LITERATURE REVIEW

Research has shown that conducting in-class activities is effective in improving student outcomes (Dickie 2006). Although there is no strong consensus about the efficiency of performing activities (Picault 2019), they improve student engagement and motivation (Logan 2022) and allow students to learn in an experiential way that makes complex concepts easier to understand and more memorable, leading to greater performance (Settlage et al. 2019). The economics education literature contains a range of classroom activities designed to facilitate understanding of core economics concepts, including building economic models (Geerling et al. 2019), comparative advantage and trade (Hong 2019), law of supply (Geerling and Mateer 2015), willingness to pay and consumer surplus (Schubert 2023), product differentiation via a blind taste test (Geerling and Mateer 2021), marginal utility and utility maximization subject to a budget constraint (Raboy 2017) and others.

Educators in American classrooms employ various interactive methods to teach students about the national debt, aiming to make this complex topic more accessible and engaging. The most common approaches include:

Budget Simulations

Students assume the role of policymakers, making decisions on federal spending and taxation to understand the challenges of balancing the national budget. The John F. Kennedy Presidential Library offers a “Federal Budget Simulation” where students debate national priorities by creating their own simulated federal budgets.

Educational Games

The Foundation for Teaching Economics (FTE) offers lessons such as “Our National Debt,” introducing students to the complexities of debt accumulation and its historical context. FTE’s activity invites students to be decision makers who must put the federal budget on a sustainable path. To do so, they need to explore alternative policies, their costs and benefits, and select a policy that could best accomplish a selected goal while bringing the debt-to-GDP ratio to a sustainable level. An alternative activity challenges students to question some common myths and misunderstandings related to the national debt through a Kahoot! competition. Miller et al. (2023) propose another activity called the Fiscal Ship game in which students choose goals and then select policies to balance their own values (achieve their own goals) with the fiscally sustainable goals of the government.

WebQuests and Multimedia Resources

Platforms like Teachers Pay Teachers provide materials where students explore various aspects of the national debt through videos, articles, and simulations. For instance, a comprehensive National Debt WebQuest guides students through interactive learning, beginning with educational videos and culminating in simulations aimed at reducing the budget deficit.

Mathematical Modeling

Incorporating mathematics, students collect data on the national debt, plot it over time, and analyze trends to understand its growth. The National Council of Teachers of Mathematics provides lessons where students determine if an exponential curve fits the national debt data, integrating mathematical concepts with real-world issues.

Classroom Discussions and Debates

Engaging students in discussions about the causes and implications of the national debt encourages critical thinking. Resources like lesson plans from Study.com offer structured content to facilitate these conversations, helping students explore different perspectives on fiscal responsibility.

Our “pop” goes the national debt activity provides teaching lesson about the national debt. This is particularly relevant given the size of the national debt and the current impasse over the debt ceiling.

THE LESSON PLAN

We use balloons to create a series of memorable moments which help students to learn about the national debt. There are two parts: The directions when implementing the activity; and follow-up materials that spur a deeper discussion about the impact of various reforms.

The Balloon Activity

Much like the national debt, a balloon can continue to grow and grow, but unless actions are taken to shrink the size of the balloon, it will grow too large and eventually pop. This is a fun, easy, interactive exercise that will get the attention of your class. The activity is visceral and goes viral easily. Your students will leave class after the activity wanting to share what happened in class with their friends.

Materials: Enough balloons for each student in your class to have one. A marker to label two balloons with “the National Debt” and “GDP.”

Class Time: 5–10 minutes to run the activity plus additional time for reflection and follow-up questions.

Class Size: We have successfully run this in classes of 400.

Difficulty: Easy

Directions:

- Pass around a bag of balloons until each student in your class has one. To expediate the demonstration, especially if your class is large, give out the balloons before class starts.
- Ask your class to blow up their balloons in small puffs. (You should participate as well!) Each puff represents the annual deficit being added to the national debt.
- As the students are slowly inflating their balloons, compare the U.S. national debt with the size of the U.S. economy and explain why and how it continues to grow at such a rapid pace. Ask your class to pause. Bring out two balloons you have blown up and tied up in a knot before class. The first balloon should be labeled “US GDP” (currently \$29 trillion). The second balloon should be labeled “U.S. National Debt” (\$36 trillion) and it should be approximately 22% larger than the GDP balloon.
- Let your class continue to blow their balloons until about half of them pop. The excitement of not knowing when the next one will go is the fun part! It adds to the fun if you count off future years. Start counting “2025, 2026, 2027, etc.” to make the point that no one knows exactly when the economy might pop.
- When about half of the balloons have popped, tell the remaining students to stop inflating their balloons. Ask the class: “Can the balloons be deflated? If so, how?”
- For every debt-reducing suggestion, have the remaining students let a small bit of air out of their balloons. However, if their suggestions would, in fact, worsen the debt problem, have them slowly add more puffs to their balloons. This incremental approach is a great way to encourage marginal thinking.
- Continue the exercise until either all the balloons have popped, or the students have successfully reduced their balloons to their original size.

Reflections

Students really enjoy this exercise. Part of the joy comes from the fact that no one likes to have a balloon pop in their face. Watching the anxious expressions of the students with the balloons popping is priceless. This is a good exercise to perform toward the beginning of class as it gives you the opportunity to gauge your students’ understanding of the debt issue before you teach the material — and it will engage everyone. As much as you might be tempted to end class with a “bang” where your students want to come back next class to learn more, the excitement you have built naturally leads to a series of follow-up questions, which are best addressed in the moment. If you have time, this video from the *Wall Street Journal* provides an excellent debrief: <https://www.wsj.com/video/series/news-explainers/when-does-the-national-debt-become-genuinely-bad>.

Follow-up Questions

To ensure that the key ideas from the activity are internalized by the students we offer three additional questions and answers.

How have demographic changes affected mandatory outlays in recent decades?

Answer: Social Security and Medicare are taking an ever-growing share of the federal budget because of three demographic factors: People are living longer: this means that people are receiving Social Security and Medicare benefits for longer periods of time and government outlays on Social Security and Medicare will increase over time. There are now far more workers retired and drawing benefits than before. The baby boomer generation is now retiring: the oldest baby boomer reached 65 in 2011. This generation has been retiring in ever increasing numbers since then.

Entitlement programs such as Social Security and Medicare currently make up more than 60% of federal outlays.

What reforms could be made to reduce those expenditure in the future?

Answer: Possible reforms include increasing the full retirement age from 67 to 70, raising the social insurance tax, adjusting the benefits computation using the CPI (inflation) instead of average wage levels, and further means testing the benefits.

The interest on the National Debt is 1.1 trillion Dollars. What is the opportunity cost of paying the interest on the National Debt?

Answer: The opportunity cost is the highest valued alternative that you give up. What else could society do with an extra 1.1 trillion? Answers will vary. Some students will argue that the government could provide additional government services, bolster Social Security, Medicare and Medicaid outcomes, invest those funds in infrastructure, and the like. Others will argue that money could have been put to better use by lowering taxes or paying down the National Debt. Economics teaches us to account for the full cost of our actions. This question helps to bring home that point.

CONCLUSION

The rising national debt is one of the most critical issues facing American consumers, the business community and politicians, both today and for generations into the future. Understanding the consequences of a large national debt, which currently stands at \$36 trillion, is paramount before an effective solution can be found. Instructors can accommodate this need for greater financial literacy by introducing innovative ways to teach students about national debt. “Pop” goes the national debt is an experiential learning activity which deepens students’ understanding of the national debt, its implications for the economy, and the complexities involved in fiscal policy making.

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Hiring Mr. Wrong: A Case-Based Class Activity on Staffing Errors and Legal Pitfalls

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ABSTRACT

Staffing practices related to selection are essential to organizational success. Specifically, human resource professionals' ability to improve staffing procedures results in improvements in organizational performance (Van Iddekinge, Ferris, Perrewe, Perryman, Bass & Heetderks, 2009). HR students must have the ability to draft a legal and appropriate job posting, evaluate measurement of selection criteria, and set interview questions that capture the knowledge, skills, and abilities necessary for the job. This activity prepares students to evaluate and improve the tasks related to staffing an organization, including evaluation of a job description, determining appropriate selection tests, and evaluating effective and legal interview questions.

Keywords: staffing, hiring, interviews, job descriptions

INTRODUCTION

"Selection is a process, not an event." (Judge & Kammeyer-Mueller, 2022, page 369). The selection process and perceived validity of the selection process have a direct effect on person and firm performance. A person's job fit has a strong correlation with job satisfaction, organizational commitment, and intended tenure (Kristof-Brown, Zimmerman & Johnson, 2005). Employees who perceive effective selection practices at their firm are more committed to their organization's success; this higher commitment leads to positive citizenship, behaviors, as well as a stronger intent to remain employed (Kehoe & Wright, 2013). Thus, having an effective selection process facilitates the firm's ability to gain and retain the human capital of the organization. The purpose of this paper is to present an experiential exercise that allows students to refine their skills in the selection process, specifically in the evaluation of the legality and effectiveness of job descriptions, responsibilities, and qualifications lists, selection tests, and interview questions. Students often learn about staffing concepts or make recommendations in case-based staffing scenarios; however, this experiential learning exercise is designed to help them take a holistic approach to applied learning. This exercise enables students to evaluate existing concerns within the staffing process and propose comprehensive improvements, creating a real-world experience that encourages more impactful skill development. Students find this activity valuable, and feedback from students regarding this exercise is positive.

EVALUATING A SELECTION PROCESS FOR EFFECTIVENESS

Human Resource selection is a process by which job postings serve as the primary initial screening tool of applicants to determine interview and selection test eligibility. Those candidates who pass the initial screenings should face selection tests that reflect the ability to meet the requirements for the job and interview questions that legally and effectively connect knowledge, skills, and abilities to the requirements noted in the job description.

Utilizing selection tests, such as physical and personality measure, as part of the selection process is associated with organizational HR benefits like savings of time and cost, higher job satisfaction and performance, and decreased resignation rate (Quast, 2011). The Society for Industrial and Organizational Psychology (2018) provides standards for selection tests used for decision-making in the hiring process. Those standards include selection, measure validation, generalizability, test, fairness and bias, data collection, analysis, and appropriate uses for specific selection metrics to understand worker requirements for job descriptions. Selection tests are useful if they allow hiring decisions that minimize selection errors and avoid adverse selection, as tests that are biased foster unethical selection decisions and legality issues (Aguinis & Smith, 1997).

Within the present activity, students are asked to utilize their acquired knowledge of staffing practices to identify problems and best-practices solutions with the job post, intelligence test, physical ability test, and personality measures described in the activity.

Drafting a job posting should be based on the knowledge, skills, and abilities necessary for the successful completion of the position. Job description writing has long been considered a challenging aspect of the selection process as this task serves a vital role in recruitment, selection, placement, orientation, training and personnel development, performance appraisal, promotions and transfers, career planning, labor relations, and job evaluation (Cascio, 1982). Resume screening is a widely used tool to narrow the scope of the job applicants. Limited academic research notes that this screening is largely a subjective measure based on the quality of the job description and the minimal and preferred requirements; thus, recruiters utilize their understanding of the job description and requirements to inform the initial screening process (Cole, Rubin, Feild, & Giles, 2007).

Based on research on selection procedure utility (Le, Oh, Shaffer, & Schmidt, 2007; Schmidt & Hunter, 1998), a measure of intelligence must be valid (i.e., effective) for measuring job performance, and the most common and effective method is a standardized employment test of general intelligence (Schmidt & Oh, 2023). These measures should only include validated items that have demonstrated significant statistical links to job performance.

Physical ability testing (PAT) is most often job-specific and involves pushing, pulling, lifting and carrying weights that replicate those found in a specific job. PAT can be used for multiple reasons at various points in the employment life cycle to ensure that an applicant's/employee's physical abilities are adequate to allow them to safely perform the work assigned to them. High fidelity PAT's, those that mimic the physical actions performed within the role, are generally preferable to simple tests of strength and endurance (Lievens & Patterson, 2011).

Personality is an important predictor of job performance. Meta-analytic evidence suggests that the five-factor model (FFM) personality traits, particularly conscientiousness and emotional stability (neuroticism), positively predict job performance; and the linear composite provides meaningful incremental validity above and beyond other key predictors (e.g., cognitive ability; Barrick et al., 2001; Judge et al., 2013; Schmidt et al., 2008). Moreover, the use of other personality inventories in employee selection, such as the Myers-Briggs Type-Indicator, have mixed and limited effects in the prediction of job performance.

Research has repeatedly shown that when constructed and used appropriately, oral employment interviews are valid for predicting job performance (Huffcutt & Arthur, 1994; McDaniel, Whetzel, Schmidt, & Maurer, 1994; Taylor & Small, 2002). However, they can be costly to administer as they require a trained interviewer to conduct and rate each interview. For assessing job performance, behaviorally/situationally-oriented scenario questioning is optimal (Taylor & Small, 2002). Blackman (2017) recommends structured interviews over unstructured, with interviewers receiving consistent training and interviewees going through a standardized process with room for probing and follow-up questions.

Title VII provided the foundation for the Equal Employment Opportunity Commission (EEOC). The Commission began with limited authority, mainly restricted to investigating complaints and seeking voluntary compliance with Title VII, but its responsibilities and impact later expanded (Hanges, Salmon & Aiken, 2013). Discrimination in hiring and promotion for workers over 40, individuals with disabilities, and pregnant individuals were later added as parts of other laws (Yusko, Bellenger, Larson, Hanges, & Aiken, 2017). Given that this activity is used at the end of the course as an intended summation of what was to be learned, students are encouraged and expected to identify the instances in which the characters within this activity do not adhere to best practices.

The legality and best practices of staffing organizations are complicated and at times flexible depending on the positions being filled. The present activity serves as a culmination of using what a student may learn during a course on organizational staffing. In practice, this activity renders fruitful conversation, debate, and review of learned material regarding EEO law, job posts, interviews, physical ability testing, intelligence testing, and personality measures.

Students are challenged to identify and remedy the poor decisions that they may one day face when working in an organization.

PROCEDURE FOR IMPLEMENTING STAFFING ACTIVITY

1. Provide a copy of the activity to each student and have them break into groups of 3-4
2. Read aloud the instructions on page 1 of the activity and emphasize the three portions of the activity that the students should complete. Instruct the class that they will have the duration of the class period—with the possibility of extending into the next class if needed to work on this activity.
3. Tell students to begin by making a list of any and all problems they see—then develop solutions to each, and finally, re-organize their list from most important to least important. Remind students that any problem that poses a legal concern should be at the top of their lists.

There is no list of correct answers provided for this activity, as answers students generate in their list will be subject to class discussion (e.g. “do you feel that three years of experience is necessary?” and “Is confidentiality necessary for this position?”). Likewise, there is no rubric for the scoring of this activity. The groups are encouraged to generate an exhaustive list of problems and solutions: however as with any experiential activity, assessment of the success of the student should be based on the student’s ability to link this exercise with the HR principles, models or legal requirements covered in the course. Additionally, students should be able to use critical thinking to analyze this complex staffing situation and propose appropriate solutions and assess best practices.

4. Provide students with ample time to generate their lists, and inquire about when they feel they have finished
5. Once all groups have finished, go through each step of the activity (starting with the job post, then selection tests, then interview) and ask where students see problems. Discuss each problem raised and bring up any problems that were not mentioned, focusing specifically on any portions that may pose legal concerns (e.g. an interviewer asking your age).

The Situation

Mr. Stevens is an eccentric millionaire who runs the Stevens Tire Emporium, whose slogan is “We’ll put tires on anything!” The primary function of the organization is to sell, and more importantly, install tires onto recreational vehicles, cars, trucks, SUVs, semi-trucks, and anything else that needs tires. The company opened in 1997, and it has been growing ever since. Stevens Tire Emporium now employs over 500 individuals and operates out of 10 stand-alone shops and one corporate office/warehouse which houses around 350 of the 500 total employees.

You are the lead HR employee for the entire company, and Mr. Stevens trusts you to oversee most HR functions. Unfortunately, Mr. Stevens often wants to be involved in organizational processes he does not understand (including HR), and he is not exceptionally receptive to negative feedback. He will generally listen to only so much information before he gets frustrated and angry at the person providing the information.

Today, Mr. Stevens has come to you stating that the company needs to create a new position in the warehouse for people who move the tires and load them into vehicles which will then transport the tires to one of the shops. He tells you that your company will need to hire 10 employees for this role. The new role will have only a few tasks, and those tasks primarily involve lifting heavy tires, moving them across the warehouse, and figuring out the best way to load the trucks to maximize how many tires they can carry. As always, Mr. Stevens wants to be highly involved in the process. Mr. Stevens works very hard and often puts together full plans, but his aim is often misdirected.

Your role will be to oversee all steps of this staffing process, and (1) determine what is being done incorrectly (either through best practices or legally), (2) figure out how you would fix each problem, and (3) organize these corrections from most important to least important. You know that Mr. Stevens has limited patience with being corrected, so you’ll need to determine what you’re comfortable leaving as is, and what will absolutely need changing.

Job Post

On Monday morning you arrive at your office and find the job post that Mr. Stevens has constructed. Please look it over and identify what might need changing.

Tire Movement Associate

Company: Stevens Tire Emporium, founded in 1997, is a tire sales and installation company based out of Mankato, Minnesota. We strive to provide customer satisfaction with each and every purchase, and we stand behind our products and installations. Stevens Tire Emporium values hard work, honesty, integrity, and a “can-do attitude”.

The job: Tire Movement Associates are primarily responsible for moving tires across a warehouse. Each person in this position must be able to lift 50 pounds, and the candidate should be above 200 pounds. The position also requires a firm understanding of the game of Tetris, as ideal candidates will need to maximize the number of tires within each loaded truck. People in this position may also be asked to spy on competing tire companies. This is a part-time entry level position, with hourly wages ranging from \$8-34

Responsibilities

- Follow instruction provided by supervising manager
- Recruit friends and family to join the Stevens Tire Emporium as both customers and employees
- Load semi-trailers with tires as specified by needs of individual shops
- A friendly personality is required for this position
- Lift and carry tires up to 60lbs across warehouse floor
- Safely avoids running into heavy equipment while working
- Maintain confidentiality of tire purchasers
- Perform other duties as requested by CEO

Qualifications

- Ability to lift 60lbs
- Master's degree in civil engineering or a related field
- Openness to work with others
- 18-34 years old
- 3 years' experience performing manual labor
- Strong communication skills
- Candidate cannot be pregnant, as this work is done in a smoke-filled environment

Preferred Qualifications

- Is from a minority group
- Knowledge of tire production and tire installation
- Owner of several vehicles with tires
- Comfortable working at night and on weekends
- Experience moving heavy objects
- Tall
- Experience as a mover or working in a warehouse environment

Selection Tests

In addition to the job post given to you by Mr. Stevens, he has also outlined the selection procedure he would like to use to hire new employees. He has stated that he wants all applicants to go through each test, and afterwards, resumes will be reviewed, and interview decisions will be made.

Intelligence test:

Mr. Stevens wants smart people in his company. He has emphasized this for all employees and generally, most folks have to take an intelligence test in order to get hired in the company. He has decided that he wants all candidates for this opening to take a 30-minute intelligence test, and only those who score in the top 20% will be considered for employment. Mr. Stevens suggests using the Wonderlic test in addition to some intelligence questions that Mr. Stevens wrote himself.

Physical ability test:

Mr. Stevens has outlined the following physical ability test for all applicants. He suggests that you weight each of the tests evenly and come up with a score for each candidate:

- Bench press (to demonstrate capacity for lifting)
- Tire lifting demonstration (up to 60lbs)
- Running a mile (to demonstrate endurance)
- Shouting ability (the warehouse gets loud)
- A skills test of loading a semi-trailer with tires to maximize space

Personality measure:

Mr. Stevens has provided you with two options for this. You can either have applicants take the Myers-Briggs personality measure with the expectation of only selecting those with the correct letter combinations, or you can use a Big Five personality measure. If using the Big Five, Mr. Stevens has stated that he would only select those with the highest scores.

Resume review:

After the tests are completed by all applicants, Mr. Stevens has told you to begin the review of resumes. He states that you should emphasize the following when reviewing resumes:

- Minority status (there is a diversity issue in the organization)
- Experience lifting/moving
- Three years' experience in performing manual labor
- Work experience that required communication

Mr. Stevens also tells you that you should consider how the applicants performed on all of their other tests when deciding who to interview. He asks your advice (weirdly) about how to determine who among the applicants will get to the interview.

Interview

In typical Mr. Stevens fashion, he has provided you with the interview questions he would like to ask applicants:

1. Why did you apply for this position?
2. What sort of work experience do you have in manual labor?
3. Can you tell us about a time that you did not get along with a co-worker?
4. What is your greatest accomplishment in your life?
5. Tell me about a time you had too many demands and not enough time to complete them
6. How old are you?
7. Tell us what you know about tires
8. Are you pregnant?
9. If you were asked to stay after and pick up an extra shift for a sick co-worker and you could not do it, what would you say?
10. What are your three greatest strengths?
11. Could we expect you to commit to working in this role for at least six years?
12. What was your favorite cartoon as a child?
13. If you were loading a truck and ran out of space for tires, what would you do?
14. Which vehicle with tires is your favorite, and why?
15. How do you feel you performed on your other tests?

Mr. Stevens has told you that after conducting each interview, you and he will have a discussion about the candidate including what you liked and did not like about each. He has stated that he does not want to write anything down but just use feel to determine who is going to be the best fit with the company.

Conducting the Interviews

Mr. Stevens wants to use panel interviews of three interviewers for each candidate. He schedules five candidates a day for the next two weeks, with a total of 50 candidates. He has stated that he can only make it to about half of the interviews, and that the third person will likely be available for around 40 of the 50, leaving you with ten interviews that you are expected to conduct yourself. Some of the interviews are scheduled for very early in the morning, and some very late at night, so you expect to be very worn out by the end of these two weeks.

On the day of the first interview, Mr. Stevens arrives ten minutes late and has missed the candidate's responses to the first three questions. He sits down and asks the candidate to start over. While you take notes on the candidate response, Mr. Stevens decides he has follow-up questions, including some that are a bit more personal than what was discussed (e.g. "how long have you lived in this state?"). When the interview concludes, Mr. Stevens tells you that he does not want to hire that candidate because their socks did not match, and because he did not like that they are from Wisconsin.

You know that you cannot continue conducting interviews in this manner, so you will need to figure out what specifically you'd like Mr. Stevens to do differently, as you know he is not exceptionally responsive to feedback.

Hiring Decision

At the end of two weeks of interviews, Mr. Stevens has checked out and has seemingly lost interest in the entire process. He decides to leave it up to you to decide who to hire. How would you make your determinations?

CONCLUSION

This activity serves as a recap of the theories and applicable skills students should have learned throughout an undergraduate class in Staffing. In practice, very few recruitment and hiring procedures adhere to all best practices, and this activity provides students a chance to identify and prioritize legal and practical issues that arise in real organizations. At the conclusion of this activity, students often express pride in their acquired capacity to identify and

resolve real-world staffing concerns, and to do so in a way that is more fun and over-the-top than what they have encountered in their own work and education.

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Innovations in Judging Quality of Student Learning: Comparing Human Professionals to GenAI

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ABSTRACT

This paper extends Lo and Goodnight (2024) by utilizing generative artificial intelligence (GenAI) to assess the quality of student learning. It examines the extent to which GenAI assessment results agree with the instructor or a second reader team in the context of direct assessment. It also observes suitable situations for using GenAI as another second reader. We find that while GenAI has some level of agreement with instructor or second reader ratings, overall levels of agreement are modest, and substantial agreement does not exist. In addition, GenAI is least likely to rate student work as failing to meet expectations, whereas instructors are the most likely to do so.

Keywords: assurance of learning, AoL, direct assessment, generative artificial intelligence, artificial intelligence, GenAI, AI

INTRODUCTION

"Quality - you know what it is, yet you don't know what it is." Over fifty years ago, Robert M. Pirsig coined the phrase to illustrate that 'Quality' is difficult to define but intuitively understood by most people. In our previous article (Lo and Goodnight, 2024), we found that for subjectively written responses, instructors and a second reader assessment team did not agree well on quality of student learning. When the student response data was more objective, for example quantitative in nature, there was higher level of agreement on student learning. Recent advances in generative artificial intelligence (GenAI) have provided new possibilities for evaluating the quality of student learning. While GenAI offers consistency, efficiency and data-driven analysis, human beings bring contextual knowledge and interpretive judgment. Our previous work compared two human professionals' assessments of student learning, yet little research has empirically documented how GenAI compares to humans. To fill this research gap, and to extend prior work, this study adopts GenAI as a third source for assessing the quality of student learning. The purpose of this study is to explore GenAI's role in direct assessment by examining the differences, if any, in assessment results between instructors, a second reader team, and GenAI, as well as to observe suitable situations for using GenAI as an assessor.

Both direct and indirect measures of student learning are used by universities and colleges within the Assurance of Learning (AoL) process to guide changes to a curriculum or program with the goal of improving student learning. 'Direct' assessment is based on inferences made by disciplinary-appropriate professionals who review work submitted by students. Indirect assessment, on the other hand, uses proxy measures, such as surveys or focus groups of graduating students, alumni, employers of alumni, supervisors of interns, and/or recruiters to infer what students are probably learning (Kelly et. al, 2010; Shaftel and Shaftel, 2007). Schools are encouraged to continually enhance their AoL process, which is noted in the 2024 AACSB State of Accreditation Report. As part of this continual improvement process, using GenAI in assessing student work and learning has made a spectacular splash in academic communities for its touted objectivity, speed, and improved use of scarce resources, as noted by AACSB's Innovation Committee in 2023. Because we currently do not have a more accurate measure of what resides within a student's brain, colleges have tended to rely more on direct assessment as the most exact assessment of student learning rather than indirect assessment (see the 2023 AACSB State of Accreditation Report). Thus, using GenAI in assessment has provided an interesting and highly appealing alternative to traditional direct assessment methods that use humans.

Anderson (2023) showed that what *is* relevant to the curriculum and program improvement process is to anchor the outcome variable of change to student learning. In the context of direct assessment, a question arises regarding who should judge students' performance and decide what was learned and how well it was learned. Some colleges let the teaching instructor be the judging professional (instructor approach), while some colleges prefer other faculty not teaching the course be the judging professional (second reader approach). We now explore a third alternative: GenAI.

Each approach has its advantages and disadvantages. Universities and colleges generally regard the second reader approach as a preferred practice in direct assessment of student learning (Gardiner et. al, 2010). The second reader

approach, however, is costly. Most schools increasingly face the challenge of having to meet more demands with shrinking resources, which motivates schools to find ways to reduce costs as much as possible. Although the second reader approach has its benefits, such as perceived objectivity and quality control, we have yet to determine who should play the role of the direct assessor. Advances in GenAI make it a possible second reader, and its lower implementation costs make it appealing. Hence this study compares assessment ratings between the three rating entities to observe their level of agreement or differences. Moreover, this study also examines the idea of a “trigger” threshold of student work *failing to meet expectations* for assurance of learning. The data are analyzed from the perspective of when one or more of the three rating entities through their assessments would “trigger” our curriculum committees and departments to review the results and recommend changes to curriculum or courses.

The sample used in the study is from one AACSB-accredited university’s undergraduate business program and contains 456 matched cases. Each case has three assessment scores: one from the teaching instructor, one from a second reader team, and one from using GenAI. The sample is further partitioned by program learning goal, course content, and teaching instructor. The comparison of assessment scores shows that, overall, while GenAI ratings of student learning seem to be more similar to second reader team ratings than to instructors’ ratings, in only one class of twenty-eight is there a relatively high level of “*moderate agreement*” between GenAI and a second reader team. Moreover, instructors would flag the most (five) classes for further review across all program learning goals, and GenAI would flag the fewest (one class). This study contributes to literature by being the first to empirically demonstrate the level of agreement between GenAI and two human assessors. Its empirical evidence sheds light on GenAI’s role in assessing the quality of student learning. The findings of the study may help colleges and universities in designing their practice for the AoL assessment and conserve valuable resources.

The remainder of the paper is organized as follows. The next section provides background, and a section that explains our methodology and sample follows. The last two sections present our results and summarize the paper, respectively.

BACKGROUND

Business programs are increasingly looking to GenAI to innovate within and enhance their AoL processes (Bisoux, 2024). Initially, the enhancements to improving the AoL process were more administrative, such as GenAI being used for gathering relevant documents, checking for errors, calculating course coverage, and summarizing faculty publications and mission-focused activities. However, recent discussion on uses of GenAI has been driving ideas around assessing student work with GenAI to streamline grading and generate tailored feedback (Verhoeven and Hor, 2025) for the purpose of course and curricular modifications or design and to conserve the considerable human resources used in the assessment process.

There are advantages when considering GenAI vs. humans in direct assessment. Speed and Efficiency benefits emerge as GenAI tools can dramatically reduce assessment cycle time. This enables faculty to devote more time to analyzing results and planning continuous improvement actions. Consistency and Equity Potential arise because where human scoring can be affected by fatigue, mood, or unconscious bias, GenAI (without forced anonymization of data) applies rubric criteria uniformly across all submissions. Scalability and Resource Savings occur as GenAI allows institutions to scale assessments without proportionally increasing staff resources. Human scorers often require more personnel, time, and compensation to achieve similar coverage, especially in large-scale assessments. Rubric Refinement and Pedagogical Insight benefits emerge, as integrating GenAI motivates faculty to redesign rubrics for precision and objectivity. This benefits both GenAI and human scoring accuracy because it clarifies expectations for students, strengthens instructional design, and makes teaching and learning more intentional. Effectiveness in Hybrid "Second Reader" Roles occurs when GenAI is paired with human evaluators, as it can efficiently handle routine scoring tasks, allowing human experts to focus on nuanced analysis. This pairing can increase overall objectivity, efficiency, and equity (DiSabito et al., 2024a, 2024b, and 2024c).

There are also disadvantages when using GenAI vs. human assessment. GenAI scoring often diverges from human scoring, particularly in subjective or nuanced tasks such as thesis evaluation. Humans, while sometimes inconsistent, may better interpret complex or discipline-specific nuances. *Rubric dependence and context limitations* mean that GenAI requires highly detailed, objective rubrics to perform reliably. Human scorers can interpret less precise rubrics using professional judgment, whereas GenAI's accuracy declines without explicit criteria. Its performance is stronger in objective contexts and weaker in subjective writing tasks. *Ethical, privacy, and data bias concerns* arise because while humans may carry personal biases, GenAI can perpetuate systemic biases from its training data. *Reduced*

instructor insight occurs when reliance on GenAI may limit instructors' direct engagement with student work, potentially reducing their awareness of individual learning needs, a strength of human grading. *Upfront implementation effort* means that deploying GenAI effectively requires substantial time to craft prompts, redesign rubrics, and conduct testing. Human scoring does not require this type of technical integration, though it demands more labor over time (DiSabito et al., 2024a, 2024b, and 2024c).

In a provocative piece, Aloisi (2023) suggested that the use of GenAI in standardized assessments of student learning may compromise the perceived validity of the assessment process. In this study, he found support for a relationship between valid exams and a trustworthy exam system within the ABI+ model of trust. First introduced by Mayer et al. (1995) and expanded by Dietz and Den Hartog (2006), the ABI+ model of trust identifies four factors that build trust within an educational context: *ability* (an [assessment] system that is able to measure an individual's knowledge and skills), *benevolence* (an [assessment] system that provides benefits to their users such as improved courses and curricula or reaccreditation of a program), *integrity* (an assurance of impartiality within the [assessment] process), and *predictability* (an [assessment] process that repeats, producing results that are stable over time).

While Aloisi applied the ABI+ model to a national exam system of secondary education in the UK to highlight possible threats to the perceived validity of assessment, similar issues may plague the use of GenAI in the AoL process for an AACSB-accredited business school. Aloisi explored three trust issues that potentially threatened the validity of GenAI-assisted [assessment] systems: *low explainability* (GenAI 'reasoning' behind assessment scores), *unreliability* (evidence that small errors or slight varying word choices can cause GenAI to provide similar student work with differing assessments), and *bias* (a belief that a benevolent system is working *for* the users, particularly students, not *against* the users). Additionally, it is in *low explainability* and *bias* where GenAI may suffer from preconceived notions of users (Zemla et al., 2017). As noted by Aloisi, users (students, faculty, or administrators) may ignore or be supportive of GenAI explanations or biases in favor of their own preexisting biases and backgrounds. While GenAI might achieve consistency, it has its own level of bias towards "...specific ages, ethnicities, genders, professions, political views or religions" and conforms to the stereotypes found in a variety of cultures (Abid et al., 2021; Garrido-Muñoz et al., 2021; Schramowski et al., 2022). It is notable that the very objectivity attributed to GenAI is unwarranted as its information is largely derived from a collective human experience. GenAI is now less evaluated on its accuracy but more so on its fairness (Gehman et al., 2020; Welbl et al., 2021). One could only assume that GenAI explanations of why student work receives a particular assessment are also subject to similar biases.

This paper explores the level of agreement (or disagreement) between instructors, a second reader team, and GenAI. Were data to show high-level agreement, we might have confidence in at least the "*predictability*" of GenAI in assessing student learning. Should GenAI substantively agree with either the second reader team or instructors, it may suggest possibilities to fold GenAI into the assessment process and opportunities for cost savings in direct assessment. Regardless of the results, however, it seems that it still would be a matter of which entity is more *trustworthy* overall. To our knowledge, this study is the first to investigate the use of GenAI in the AoL process with this analysis. It is our hope that our findings may benefit higher education in their discussions relative to assurance of learning.

METHODOLOGY

To be consistent with our prior study, the methodology and data set are the same as the original paper (Lo and Goodnight, 2024). The GenAI integrated tool used in this study is named "Walter." As noted earlier, one area that is addressed in this paper but was not examined in our previous work is the idea of a "trigger" threshold of student work *failing to meet expectations* for assurance of learning. These "triggers" in our Assurance of Learning Assessment Process Model (see Lo and Goodnight, 2024) would occur at the point where the assessment results are presented to our Faculty and Strategic Planning Team.

During the review year, three program learning goals (PLGs) were assessed for the College of Business BSBA (Bachelor of Science in Business Administration) program. They are (a) PLG 2: To generate, evaluate, and select alternatives consistent with standards of ethical behavior, (b) PLG 6: To recognize the dynamic domestic and international factors that shape and transform the business environment, and (c) PLG 7: To understand the fundamental concepts from the business disciplines in Finance and Management. In this review year, in addition to a second reader assessment team evaluating students' performance, the instructor for each course was also asked to evaluate their students using the *same* classification system that the second reader assessment team utilized. Walter was added as an additional rater, also using the same classification system.

The ratings provided by the instructors, the second reader team, and Walter are ordinally scaled over three categories: Fails to Meet Expectations (coded as 1), Meets Expectations (coded as 2), and Exceeds Expectations (coded as 3). A Kappa statistic value is an ideal tool to determine the level of agreement between raters (McHugh, 2012). Possible values of Cohen's Kappa statistics are within the range of -1 and +1 (Cohen, 1960), although they normally fall between 0 and +1. A zero Kappa statistic value means that agreement between two raters is no better than that expected by chance, as if they had simply guessed every rating. Figure 1 below indicates how a Kappa statistic value might be interpreted on the positive side of the range (Landis & Koch, 1977):

Figure 1: Interpretation of Kappa Statistic Value

Kappa Statistic	Interpretation
< 0	Poor agreement
0.00 – 0.20	Slight agreement
0.21 – 0.40	Fair agreement
0.41 – 0.60	Moderate agreement
0.61 – 0.80	Substantial agreement
0.81 – 1.00	Almost perfect agreement

For our purposes, we will interpret Kappa statistics following Figure 1 above. Given that the instructors, the second reader team, and Walter used the same classification for student performance, we consider substantial or higher levels of agreement, per a Kappa statistic value of 0.61 and above, as reasonable to expect in agreement.

Table 1: Data Sources

Learning Goal	Course	Frequency of Students		
		Instructor	Course	PLG
PLG 2	Introduction to Business Law		56	
PLG 2	Business Ethics (Instructor 1)	24		
PLG 2	Business Ethics (Instructor 2)	40	64	
	Total for PLG 2			120
PLG 6	Intro to Business Info Systems (Instructor 1)	32		
PLG 6	Intro to Business Info Systems (Instructor 2)	40	72	
PLG 6	Principles of Marketing (Instructor 1)	40		
PLG 6	Principles of Marketing (Instructor 2)	40	80	
PLG 6	Product Development & Innovation (Instructor 1)	32		
PLG 6	Product Development & Innovation (Instructor 2)	32	64	
PLG 6	Business Strategy		40	
	Total for PLG 6			256
PLG 7	Introduction to Finance (Instructor 1)	25		
PLG 7	Introduction to Finance (Instructor 2)	15	40	
PLG 7	Management & OB (Instructor 1)	24		
PLG 7	Management & OB (Instructor 2)	16	40	
	Total for PLG 7			80
Grand Total				456

The sample used in this study (see Table 1 above) contains 456 artifacts of student work from our BSBA program. Our previous paper described the sampling process in detail. In this study, each student's work is rated by course teaching instructor, a three-member assessment team, and Walter. The rating data are analyzed at four levels. First, in a pooled sample to observe if there is an overall difference between the three raters. Second, the sample is partitioned by PLG to find out if the pooled results are driven by a particular learning goal. Third, we examine separate disciplinary course content within each learning goal to have a finer observation by content taught. Lastly, we further partition the sample by individual instructor to see if a particular instructor is driving the results for a respective PLG or course content. Thus, Kappa statistic values are calculated overall, for each BSBA PLG assessed, by course content (disciplinary content), and by instructor. If there is a difference from the pooled analysis, the results from the remaining partitioned samples allow us to observe the characteristics that are associated with different ratings.

Walter is a proprietary GenAI Software-as-a-Service tool developed by AI Integrated Concepts, Inc., and tailored for academic accreditation and assessment tasks. For this study, Walter is configured to apply the exact same rubric used by the human evaluators to ensure consistency in criteria and scoring. In practice, this means that Walter is provided with each competency’s description and the rubric definitions of what constitutes *Exceeds*, *Meets*, or *Fails* expectations, along with the point values for each level. For example, if the Ethical Reasoning competency “Justify Ethical Judgments” requires applying ethical theories to a scenario, Walter is instructed on the rubric standards so that a response applying multiple theories would earn 3 points (Exceeds), one theory with basic evaluation 2 points (Meets), or no theory 1 point (Fails). By mirroring the rubric guidelines, the GenAI’s scoring scale is aligned one-to-one with the human scoring scale.

Walter’s natural language processing capabilities enables it to read and evaluate large volumes of text rapidly. Notably, the tool is capable of reading on the order of *100 five-page papers in about one minute* and producing rubric-based evaluations for each artifact. In this study, the volume of artifacts is manageable (in the hundreds), but Walter’s high output ensures that all student works are assessed in a consistent manner within minutes. During Walter’s evaluation, no human intervention is required. Walter autonomously analyzes the content of each artifact and determines the appropriate score (1, 2, or 3 points) for the competency in question based on the rubric criteria.

RESULTS

As indicated earlier, we consider a Kappa value of .61 as having *substantial agreement* between rating parties. Results below are replicated relative to instructor and second reader team levels of agreement from the previous study (Lo and Goodnight 2024) and shown by way of comparison to GenAI (Walter). A pooled sample analysis is reported in Table 2. Over all 456 respondents, Kappa statistic values ranging between 0.09 and 0.16 (indicating *slight agreement* between the three rating parties) are calculated with associated significance levels. Because 0.16 is well below our desired threshold of 0.61, we consider the instructor, second reader, and Walter’s ratings do not agree well with each other. It is a disturbing finding, not only because a shadow has been cast over the idea of reducing assessment expenditures with GenAI, but it calls into question *trust*, in both an ‘objective’ machine’s assessment as well as in professional human assessments of learning.

Table 2: Pooled Sample Results – Percent Agreement

Observed Sample	Instructor and Second Reader Team	Instructor and Walter	Second Reader Team and Walter
Overall (n=456)	49.35% Agreement Kappa ^a = 0.16; p<.001	44.52% Agreement Kappa ^a = 0.09; p=.010	50.22% Agreement Kappa ^a = 0.14; p<.001

^a: Numbers in bold indicate the two raters have statistically significant *slight agreement* ($0.00 \leq \text{Kappa} \leq 0.20$).

Table 3 reports failing percentage rated by the three parties in the pooled sample. The results show that in addition to having only *slight levels of agreement* between raters, instructors categorize student work as failing to meet expectations for assurance of learning more than the second reader team, and both raters categorize student work as

Table 3: Pooled Sample Results – Percent “Fails to Meet Expectations”

Observed Sample	Rated by Instructor	Rated by second reader team	Rated by Walter
Overall (n=456)	16.45%	10.75%	6.14%

such more than Walter. It appears Walter is the most lenient (per percentage of students categorized as failing to meet expectations) rater. Collectively, the results reported in Tables 2 and 3 show that overall assessment results differ between the teaching instructors, the second reader team, *and* Walter. In addition, counter to conventional wisdom, the perceived ‘objectivity’ of the assessment team and GenAI did not translate into categorizing more students as ‘failing to meet expectations.’ On the contrary, the assessment team and GenAI ‘pass’ more students. As differences exist between these raters, our following analyses explore these differences by program learning goal, course content, and instructor.

Table 4 provides the results of our analysis by folding in ratings from GenAI at the separate PLG level. Walter shows *slight agreement* with the instructor on PLG 6 and with the second reader team on PLG 2 and PLG 6. When comparing

Table 4: Results by Program Learning Goal – Percent Agreement

Observed Sample	Instructor and Second Reader Team	Instructor and Walter	Second Reader Team and Walter
PLG 2 (n=120)	51.67% Agreement Kappa ^b = 0.24; p<.001	43.34% Agreement Kappa = 0.09; p=.183	48.33% Agreement Kappa ^a = 0.17 ; p=.010
PLG 6 (n=256)	42.97% Agreement Kappa = 0.05; p=.258	47.27% Agreement Kappa ^a = 0.11 ; p=.023	53.91% Agreement Kappa ^a = 0.16 ; p=.003
PLG 7 (n=80)	66.25% Agreement Kappa ^b = 0.37; p<.001	37.5% Agreement Kappa = 0.07; p=.285	41.25% Agreement Kappa = 0.11; p=.075

^a: Numbers in bold indicate the two raters have statistically significant *slight agreement* ($0.00 \leq \text{Kappa} \leq 0.20$).

^b: Gray-highlighted numbers indicate the two raters have statistically significant *fair agreement* ($0.21 \leq \text{Kappa} \leq 0.40$).

Table 4 to Table 2, we find that the level of overall agreement between instructor and second reader team (between instructors and Walter, and between second reader team and Walter) appears to be adversely affected by PLG 6 and PLG7, respectively.

In our AoL process, a “*trigger*” occurs (which activates a ‘closing of the loop process’ discussed by Tarnoff 2023) when student learning on any program learning objective falls below a particular threshold, generally 80% (or when student work rated *fails to meet the expectations* exceeds 20%). Table 5 indicates which, if any, program learning goals might undergo further review by our committees or departments for possible revision or redesign of curriculum.

Table 5: Results by Program Learning Goal – Percent “Fails to Meet Expectations”

Observed Sample	Rated by Instructor	Rated by second reader team	Rated by Walter
PLG 2 (n=120)	20.00% ^a	20.83% ^a	11.67%
PLG 6 (n=256)	15.23%	5.86%	4.69%
PLG 7 (n=80)	15.00%	11.25%	2.50%

^a: Highlighted numbers indicate a possible ‘trigger’ to modify courses and/or curriculum.

Table 5 provides the results for the percentage of student work considered as *failing to meet the expectations* of all three raters by each PLG. For PLG 2, both instructors and the second reader team rate student work as failing to meet expectations for 20% or more of the time. Thus, in our current AoL process, PLG 2 would possibly trigger reviews and changes within specific courses and at the curricular level. It is also interesting to note that (a) it is with PLG 2 that the second reader team slightly exceeds the instructor on rating student work unacceptable (breaking the previous pattern between the raters viewed overall and observed on PLG 6 and PLG 7), and (b) Walter is still the most lenient rater across all three PLGs. In summary, results reported in Tables 4 and 5 show that the difference in ratings between instructors and second reader team is primarily driven by PLG 6, while the low-level agreement between Walter and instructors (or second reader) is mainly driven by PLG 2 and PLG7. Administratively, over-analyzing a program’s learning goals can be fraught with monetary and faculty hour expense. However, failing to align a program’s learning goals with course content and the overall curriculum could create inconsistencies in student learning. Given the importance of creating competent business professionals whose impact on their companies, organizations, and society in general can be profound, more comfort might be found in reviewing an extra program learning goal or two rather than missing issues entirely (as might be indicated by GenAI during this assessment year).

We further analyzed the data by course content and report percent agreement between rating entities in Table 6 on the next page. The results indicate that GenAI does not yield high levels of agreement with either instructors or the second reader team over course content. Walter shows *fair agreement* with the instructors in Business Information Systems course for PLG 6 and with the second reader team within Business Ethics (PLG 2) and Product Development and Innovation (PLG 6). Comparing Table 6 to Table 4, we find that the overall level of agreement between raters is affected not only by PLGs (in Table 4), but also by specific courses.

Note that agreement between the second reader team and Walter is remarkably high (70%) within PLG 6 for the Business Strategy content yet does not earn a corresponding high Kappa statistic. When looking at the data specifically, we find that the low Kappa level and subsequent insignificant results are due to low data counts in five of eight cells. Further, while the instructor and second reader team have a significant level of agreement in the Finance course

(driving agreement for PLG 7), Walter does not concur. Hence, inconsistencies in GenAI and its agreement with instructor or the second reader team persists at the course content level.

Table 6: Results by Course Content – Percent Agreement

Observed Sample	Instructor and Second Reader Team	Instructor and Walter	Second Reader Team and Walter
(PLG 2) (n=56) Business Law	57.14% Agreement Kappa ^b = 0.35; p<.001	41.07% Agreement Kappa = 0.06; p=.463	39.29% Agreement Kappa = -0.05; p=.542
(PLG 2) (n=64) Business Ethics	46.88% Agreement Kappa = 0.11; p=.246	45.31% Agreement Kappa = 0.04; p=.649	56.25% Agreement Kappa ^b = 0.21; p=.010
(PLG 6) (n=72) Business Info Systems	41.67% Agreement Kappa = 0.06; p=.381	63.89% Agreement Kappa ^b = 0.24; p=.007	40.28% Agreement Kappa = -0.02; p=.806
(PLG 6) (n=80) Marketing	47.50% Agreement Kappa ^a = 0.17 ; p=.035	46.25% Agreement Kappa = 0.11; p=.171	51.25% Agreement Kappa = 0.17; p=.059
(PLG 6) (n=64) Product Development and Innovation	48.43% Agreement Kappa = 0.08; p=.466	43.75% Agreement Kappa = 0.03; p=.763	62.50% Agreement Kappa ^b = 0.29; p=.011
(PLG 6) (n=40) Business Strategy	27.50% Agreement Kappa = -0.15; p=.131	25.00% Agreement Kappa = -0.01; p=.618	70.00% Agreement Kappa = -0.05; p=.533
(PLG 7) (n=40) Finance	82.50% Agreement Kappa^c = 0.64 ; p<.001	42.50% Agreement Kappa = 0.14; p=.122	40.00% Agreement Kappa = 0.04; p=.630
(PLG 7) (n=40) Management	50.00% Agreement Kappa = 0.07; p=.598	32.50% Agreement Kappa = -0.10; p=.065	42.50% Agreement Kappa = -0.01; p=.910

^a: Numbers in bold indicate the two raters have statistically significant *slight agreement* ($0.00 \leq \text{Kappa} \leq 0.20$).

^b: Gray-highlighted numbers indicate the two raters have statistically significant *fair agreement* ($0.21 \leq \text{Kappa} \leq 0.40$).

^c: Black-highlighted numbers indicate the two raters have statistically significant *substantial agreement* ($0.61 \leq \text{Kappa} \leq 0.80$).

Next, we turn to the areas at the course content level that might signal course and/or curriculum revision activities for “closing the loop” in Table 7. It seems evident that revising course content in the Business Law course, or curriculum, would be considered for PLG 2 over every rating entity. For the remaining courses, the second reader team and Walter would not trigger any closing-of-the-loop activities. Moreover, neither the second reader team nor Walter rates any student work in the Business Strategy course as *fails to meet expectations*, and Water’s role as the most lenient rater appears to be course specific.

Table 7: Results by Course Content – Percent “Fails to Meet Expectations”

Observed Sample	Rated by Instructor	Rated by second reader team	Rated by Walter
(PLG 2) (n=56) Business Law	32.14% ^a	28.57% ^a	21.43% ^a
(PLG 2) (n=64) Business Ethics	9.38%	14.06	3.13%
(PLG 6) (n=72) Business Information Systems	16.67%	2.78%	9.72%
(PLG 6) (n=80) Marketing	20.00% ^a	16.25%	1.25%
(PLG 6) (n=64) Product Development & Innovation	12.50%	00.00%	6.25%
(PLG 6) (n=40) Business Strategy	7.50%	00.00%	00.00%
(PLG 7) (n=40) Finance	27.50% ^a	15.00%	5.00%
(PLG 7) (n=40) Management	2.50%	7.50%	00.00%

^a: Highlighted numbers indicate a possible ‘trigger’ to modify courses and/or curriculum.

Lastly, we examine the data at the instructor level (see Table 8). The results reveal that Walter has *slight agreement* with the instructor on Instructor 2's Business Ethics Course and *fair agreement* on Instructor 1's Business Information Systems course. Relative to the second reader team, Walter shows *slight agreement* on Instructor 2's Business Ethics course and *moderate agreement* on Instructor 1's Product Development & Innovation course. Thus, in only one course does Walter have consistent (*slight*) agreement with both other rating entities. Overall, in only four cases out of twenty-eight does Walter agree (although only *slightly* to *moderately*) with either instructors or the second reader team.

Table 8: Results by Instructor – Percent Agreement

Observed Sample	Instructor and Second Reader Team	Instructor and Walter	Second Reader Team and Walter
(PLG 2) (n=56) Business Law	57.14% Agreement Kappa ^b = 0.35; p<.001	41.07% Agreement Kappa = 0.06; p=.463	39.29% Agreement Kappa = -0.05; p=.542
(PLG 2) (n=24) Business Ethics (Instructor 1) ^d	37.50% Agreement Kappa = 0.03; p=.820	45.83% Agreement Kappa = -0.01; p=.971	33.33% Agreement Kappa = -0.06; p=.578
(PLG 2) (n=40) Business Ethics (Instructor 2)	52.50% Agreement Kappa ^b = 0.22; p=.044	45.00% Agreement Kappa ^a = 0.11; p=.003	70.00% Agreement Kappa ^a = 0.15; p=.019
(PLG 6) (n=32) Business Info Systems (Instructor 1)	65.62% Agreement Kappa = 0.14; p=.242	65.63% Agreement Kappa ^b = 0.29; p=.020	59.38% Agreement Kappa = -0.05; p=.712
(PLG 6) (n=40) Business Info Systems (Instructor 2)	22.50% Agreement Kappa = 0.03; p=.592	62.50% Agreement Kappa = 0.19; p=.103	25.00% Agreement Kappa = 0.03; p=.540
(PLG 6) (n=40) Marketing (Instructor 1)	47.50% Agreement Kappa = 0.09; p=.381	42.50% Agreement Kappa = 0.08; p=.428	47.50% Agreement Kappa = 0.07; p=.361
(PLG 6) (n=40) Marketing (Instructor 2)	47.50% Agreement Kappa ^a = 0.17; p=.040	50.00% Agreement Kappa = 0.13; p=.290	55.00% Agreement Kappa = 0.11; p=.228
(PLG 6) (n=32) Product Development & Innovation (Instructor 1)	46.87% Agreement Kappa = 0.13; p=.234	34.38% Agreement Kappa = -0.04; p=.746	68.75% Agreement Kappa ^c = 0.41; p=.010
(PLG 6) (n=32) Product Development & Innovation (Instructor 2) ^d	50.00% Agreement Kappa = 0.06; p=.706	53.12% Agreement Kappa = 0.14; p=.342	56.25% Agreement Kappa = 0.15; p=.342
(PLG 6) (n=40) Business Strategy	27.50% Agreement Kappa = -0.15; p=.131	25.00% Agreement Kappa = -0.01; p=.618	70.00% Agreement Kappa = -0.05; p=.533
(PLG 7) (n=25) Finance (Instructor 1)	88.00% Agreement Kappa ^d = 0.75; p<.001	44.00% Agreement Kappa = 0.12; p=.384	44.00% Agreement Kappa = 0.06; p=.581
(PLG 7) (n=15) Finance (Instructor 2) ^d	73.33% Agreement Kappa ^c = 0.46; p=.022	40.00% Agreement Kappa = 0.17; p=.162	33.33% Agreement Kappa = 0.00; p=1.000
(PLG 7) (n=24) Management (Instructor 1)	54.17% Agreement Kappa = 0.17; p=.309	37.50% Agreement Kappa = -0.17; p=.108	29.17% Agreement Kappa = -0.04; p=.628
(PLG 7) (n=16) Management (Instructor 2)	43.75% Agreement Kappa = 0.04; p=.823	25.00% Agreement Kappa = NA ^c ; p: NA ^c	62.50% Agreement Kappa = NA ^c ; p: NA ^c

^a: Numbers in bold indicate the two raters have statistically significant *slight agreement* ($0.00 \leq \text{Kappa} \leq 0.20$).

^b: Gray-highlighted numbers indicate the two raters have statistically significant *fair agreement* ($0.21 \leq \text{Kappa} \leq 0.40$).

^c: Dark gray-highlighted numbers indicate the two raters have statistically significant *moderate agreement* ($0.41 \leq \text{Kappa} \leq 0.60$).

^d: Black-highlighted numbers indicate the two raters have statistically significant *substantial agreement* ($0.61 \leq \text{Kappa} \leq 0.80$).

^e: No statistics are computed because Walter's rating is constant.

^d: Class taught by an adjunct professor.

When observing data for process “trigger points” by class or instructor (in Table 9), there are areas where courses might be flagged for review due to more student work failing to meet learning goal expectations. As reported in Table 7, when data are analyzed at the course level, every rating entity indicates that, in PLG 2, revising course content or curriculum would be necessary for the Business Law course, but not for the Business Ethics course. The instructor level analysis, however, shows that the second reader team flags the Business Ethics course taught by Instructor 1, who is an adjunct professor.

Table 9: Results by Instructor – Percent “Fails to Meet Expectations”

Observed Sample	Rated by Instructor	Rated by second reader team	Rated by Walter
(PLG 2) (n=56) Business Law	32.14%	28.57%	21.43%
(PLG 2) (n=24) Business Ethics (Instructor 1) ^b	8.33%	20.83%	00.00%
(PLG 2) (n=40) Business Ethics (Instructor 2)	10.00%	10.00%	5.00%
(PLG 6) (n=32) Business Info Systems (Instructor 1)	18.75%	3.13%	6.25%
(PLG 6) (n=40) Business Info Systems (Instructor 2)	15.00%	2.50%	12.50%
(PLG 6) (n=40) Marketing (Instructor 1)	27.50%	20.00%	00.00%
(PLG 6) (n=40) Marketing (Instructor 2)	12.50%	12.50%	2.5%
(PLG 6) (n=32) Product Development & Innovation (Instructor 1)	25.00%	00.00%	6.25%
(PLG 6) (n=32) Product Development & Innovation (Instructor 2) ^b	00.00%	00.00%	6.25%
(PLG 6) (n=40) Business Strategy	7.50%	00.00%	00.00%
(PLG 7) (n=25) Finance (Instructor 1)	20.00%	12.00%	4.00%
(PLG 7) (n=15) Finance (Instructor 2) ^b	40.00%	20.00%	6.67%
(PLG 7) (n=24) Management (Instructor 1)	00.00%	12.50%	00.00%
(PLG 7) (n=16) Management (Instructor 2)	6.25%	00.00%	00.00%

^a: Highlighted numbers indicate a possible ‘trigger’ to modify courses and/or curriculum.

^b: Class taught by an adjunct professor.

Table 9 indicates that Walter does not flag any class for revision except for Business Law. As an overall assessment from the instructor level, the instructors for their own courses tend to ‘fail’ student work more than either the second reader team or Walter, which is consistent with the course content level results reported in Table 7. From most to least classes flagged for review, instructors flag five, the second reader team flags four, and Walter flags one (in agreement with both instructor and second reader team for Business Law). As alluded to in the background above, a reliance on GenAI in this case (Table 9) may create a false sense of student success which may in turn result in missing signals of needed curriculum revision to improve student learning. It should be noted, however, that because any particular rater categorizes fewer (or more) students as ‘failing to meet expectations,’ it does not follow that this is necessarily an indictment of (or advocacy for) that particular rater. The discussion of ‘trust’ in the rating entity and their capabilities to accurately assess quality of student learning continues to be the central issue.

SUMMARY AND CONCLUSIONS

Lo and Goodnight (2024) examined direct assessment rating results between teaching instructors and a second reader team for the purpose of conserving assessment costs. They found the appropriateness of using instructor approach is contextual and may best be suited for quantitative or well-structured courses. This study extends the findings in that paper by bringing in GenAI to assess student learning. We use the same data and treat GenAI as the third “reader” alongside the teaching instructor and a second reader assessment team. Our objective is to examine whether GenAI assessment results agree with the instructor or a second reader team using our existing program learning goal rubrics and observe suitable situations for using GenAI as another second reader.

The methodology used in this study follows Lo and Goodnight (2024), and the empirical data are over a wide range of business content areas. We use Kappa statistics and analyze the data at four levels: pooled sample, partitioned sample by PLG, further by course content, and finally by teaching instructor. Our overall results are not promising from the viewpoint of an administrator seeking to confidently decide on ways to reduce resources utilized for the AoL process. *Substantial agreement* between rating parties is not found overall (at most there is *slight agreement*), by Program Learning Goals (at most there is *fair agreement*), over course content (where at most there is *fair agreement* except in one case, Finance, where there is *substantial agreement* between two instructors and the second reader team), or at the instructor level (where only one case of forty-two presented with *substantial agreement* between the instructor and the second reader team). Hence, GenAI has not met the central tenant of “Trust” from the ABI+ framework, *predictability*, per this study. Further, instructors flag the most courses for further review, and GenAI flags the fewest, at both course content level and teaching instructor level. This pattern of leniency raises important concerns for institutions considering GenAI as a standalone assessor: reliance on GenAI alone using existing rubrics to assess program learning goals could generate false signals of student success, potentially masking areas requiring curricular intervention and undermining the integrity of the AoL process. As Hansen et al. (2024) found in their rubric design research, different assignments of different complexities yield different inter-rater reliability results with GenAI assessment. Programs must carefully weigh this risk when deciding whether and how to integrate GenAI into their assessment frameworks.

There is a progressively new method, Rapid Rubric Iteration Process (RRIP) Hansen et al. (2024), that seeks to address the gaps levels of agreement such as found in this paper. Walter's consistent leniency may stem from subjective language in our existing rubrics, language that human evaluators navigate through professional judgment, but that GenAI interprets more literally or permissively. As noted above, GenAI requires highly detailed, objective rubrics to perform reliably, and its accuracy declines without explicit criteria. In the present study, however, RRIP was purposely not applied as we wanted to determine a baseline level of agreement over our existing Program Learning Goals. Our baseline findings underscore the critical importance of precise, objective rubric design when incorporating GenAI into assessment processes. Future research could extend our findings by testing whether RRIP's timesaving, precision-focused approach improves alignment and trust across multiple contexts and disciplines while also mitigating the low levels of interrater reliability observed in this study.

This study is the first to incorporate GenAI as a potential judging “professional” in the direct assessment of AoL practice. Using a second reader in direct assessment is preferred but more costly than using the teaching instructor. To conserve costs, schools may be tempted to use teaching instructors. Prior literature, however, documents that it may only be appropriate for quantitative or well-structured courses. The results of this study show that GenAI has no case where there is *substantive agreement* with either instructor or second reader team. These findings complement the Lo and Goodnight (2024) study, which suggests that while there may be some agreement between rating entities in specific content or instructor-taught areas/courses, overall levels of agreement are modest or nonexistent. Our study contributes to the literature by providing empirical evidence on how GenAI compares to teaching instructors and a second reader team as an AoL assessor. The level of agreement reported in the study can shed light for colleges in choosing judging professionals to implement their direct assessment.

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Transparency Statement

Co-author David M. DiSabito, Jr. is the founder of AI Integrated Concepts, Inc., the developer of the Walter GenAI assessment tool referenced in this study. This relationship has been disclosed in the interest of transparency.

A Multi-year Approach to Maximizing the Success of a Student Managed Investment Fund

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ABSTRACT

Student Managed Investment Funds (SMIFs) are increasingly used to integrate experiential learning into business education. While existing research offers general overviews, survey results, or case studies that provide insights gained from utilizing SMIFs, this paper contributes to the literature by examining how Villanova University's structured multi-year training program, which prepares students for participation in its SMIF, enhances both fund performance and student career readiness. By combining academic coursework, student-led academics, and progressive experiential learning, the Villanova model systematically builds students' technical, analytical, and professional skills, resulting in increased fund performance and 100% internship placement for portfolio managers at major financial institutions. These results suggest that embedding multi-year preparation within the finance curriculum can substantially improve both educational impact and SMIF operational success.

Keywords: student managed investment fund, SMIF, student portfolio management, finance curriculum, experiential learning

INTRODUCTION

Overview of Student Managed Investment Funds (SMIFs)

The earliest documented Student Managed Investment Funds (SMIF) were at Lafayette College in 1946 (Intentional Endowments Network, 2021) and Gannon University in 1952 (Gradisher, et al., 2016). Since that time, SMIFs have become widely accepted as a valuable learning tool from both an academic and practical perspective (Gradisher et al., 2016; Kubik, 2018; Lawrence, 1990, 1994, 2008; Neely and Cooley, 2004).

Published research provides evidence that SMIFs benefit both students and their institutions. Kahl (1997) shows that SMIF participation provides a realistic and worthwhile learning experience to students that then increases their employability. Lawrence (2008) found that 81% of faculty surveyed felt that students who actively participated in SMIFs were "better trained" and had an advantage upon entering the workforce post-graduation. Boughton and Jackson (2020) also find evidence that the education from SMIF participation enhances internship and job placement, and they further note additional benefits from SMIFs of increased visibility of the university and specific programs, development of alumni/professional relationships, and improved program recruitment and retention. Case studies provide further evidence that SMIFs provide career development (e.g., Carlston et al., 2018) and enhance employability (e.g., Block and French, 1991).

As a result of their multiple benefits, SMIFs now number more than 500 (SMIFC, 2025), and many funds manage substantial and increasing assets. The Center for Investment Research (2025) reports that the fund assets under management (AUM) range from a low of \$1,000 to a high of \$75 million at the University of Dayton. Todd and Velarde (2024) report mean and median AUM of \$3.996 million and \$850,000 respectively. In contrast, research from 2008 reported that the average fund managed \$1.3 million in assets (Lawrence, 2008).

Implementation of Student Managed Investment Funds

SMIFs are typically connected to academic courses and/or to student organizations. SMIF surveys, such as Block and French (1991), Neely and Cooley (2004), Lawrence (2008) and Boughton and Jackson (2019), report that most SMIFs are directly tied to a course. In perhaps the most comprehensive look at SMIFs, Lawrence (2008) found that 71% of the SMIFs in the USA are part of a formal class, making it the most popular approach to implementing an SMIF. A more recent survey by Todd and Velarde (2024) found that half of the funds are embedded in courses and 46% of the funds are structured as student organizations; 5% of funds employ both models. Carlston et al.'s (2018) case study of the University of the Pacific provides an example of how an SMIF can be operated under a student organization

structure. Other case studies provide details of formal courses attached to SMIF participation, such as “Security Valuation” and “Portfolio Management” at the University of Connecticut (Ghosh et al., 2019), “Fixed Income Analysis & Portfolio Management” at Illinois State’s Educational Fixed Income Fund (Howe, et al., 2020), and “Seminar in Finance: Applied Equity Analysis” at Illinois State’s equity-oriented Educational Investment Fund (Howe, et al., 2020).

University courses that incorporate an SMIF tend to be offered at the undergraduate level. Todd and Velarde (2024) note that fund membership skews heavily toward undergraduate students: 58% of the funds serve undergraduate students only; 9% of the funds serve graduate students only; 33% serve both undergraduate and graduate students.

SMIFs vary in their investment focus. Kubik (2018) found that all participating SMIFs were allowed to invest in equities. Far fewer SMIFs are allowed to invest in other asset classes. Slightly more than one-third of SMIFs can invest in fixed income, less than 20% in options, and less than 10% in commodities and other asset classes. In addition, Todd and Velarde (2024) found that 28% of the funds follow an Environmental, Social, and Governance (ESG) investment strategy. An example of how SMIFs can broaden their investment focus is provided by Ascioğlu and Maloney (2020) who chronicle the transformation of Bryant University’s Archway Investment Fund from a U.S. equity-focused portfolio into a comprehensive multi-asset program. Established in 2005, the fund now encompasses U.S. and non-U.S. equities, equity ETFs, REITs, individual bonds, fixed income ETFs, and options. A significant development in this evolution is the integration of ESG criteria into the investment process.

SMIF programs entrust students with substantial responsibility. For instance, Lawrence (2008) reports that in 90% of surveyed SMIFs, students make all investment decisions. In other programs, a faculty member or an advisory board share in the decision-making process. Funds managed solely by students can ensure consistency in their investment strategies despite the constant turnover in portfolio managers by having an Investment Policy Statement setting forth the fund’s policies and procedures (Gradisher, et al., 2016).

The Value of Structured Multi-Year SMIF Training

In this section, we draw upon observations and concerns raised in previous case studies to argue for the value of extensive academic and professional student training *prior to* and during SMIF participation. The remainder of the paper then extends prior research by describing in detail the structured multi-year training employed by Villanova University to provide the groundwork for a successful SMIF experience. This contrasts with prior case studies that describe SMIF coursework, activities, and outcomes with, at most, only vague references to training activities leading to fund participation.

SMIF programs are demanding in terms of both time and expected participant knowledge and skills. Lin (2022) notes that students face such a steep learning curve upon joining an SMIF that they usually cannot make any portfolio changes before the end of a semester, limiting their window for making trades. Similarly, Kahl’s (1997) SMIF case study noted that heavy student workload is a key operational challenge. This workload includes obtaining necessary conceptual and professional knowledge and performing all the necessary tasks to apply that knowledge to fund management. Ascioğlu and Maloney (2020), for example, describe how the Bryant University Archway Investment Fund is connected to two 3-credit courses, in addition to which students in both courses are required to attend a weekly common session that includes activities such as Bloomberg training. These academic requirements are concurrent with the students’ obligations in managing the fund.

A well-coordinated, multi-year program can provide much of the necessary educational and professional background prior to student participation in an SMIF, reducing the burden on students during their time with the fund. To the extent participation in the fund requires enrollment in extra academic sessions such as Bloomberg training, the length and difficulty of such concurrent extra sessions can be minimized if the students receive preparatory training earlier in their college experience. For example, all Villanova School of Business (VSB) students are required to complete Bloomberg Market Concepts certification during their freshman year. The VSB students have ample opportunities to apply their Bloomberg knowledge early in their college careers through finance and accounting courses and the Villanova Finance Group, a student organization that we discuss further in the next section. With coordination, business schools can move other key topics and skill training earlier in the business curriculum. Villanova, for instance, moved the Principles of Financial Accounting course from sophomore year to the freshman spring semester, and most students can take Principles of Finance in the fall of sophomore year. By scheduling these prerequisite core classes early in the students’ academic careers, interested students are able to take multiple relevant finance and other electives prior to becoming portfolio managers in the spring of their junior year. Moreover, these scheduling changes

are consistent with the recommendation of Block and French (1991), who, after examining the SMIF at Texas Christian University, conclude that it would be desirable for students to have more coursework before entering the fund. Schools can also offer students advance preparation for the positions they will assume in the SMIF. For example, Carlston et al. (2018) report that the University of the Pacific, like many SMIFs, assigns students to roles that mirror professional investment fund roles, such as fund manager and risk manager. Schools can introduce students to these positions and begin developing relevant skill sets early in the students' college careers through guest speakers, mentorship programs, student-led extracurricular training, and other activities.

Early development activities can have benefits that extend to leadership and career development. For example, Charlton et al (2015) note that SMIF managers at the University of Richmond gain leadership experience by working to inspire and motivate underclassmen to learn investments and build competencies that will improve the quality of future SMIF applicants. In addition, students engaged in pre-SMIF development can make more informed coursework decisions, develop networks sooner, and be better prepared for professional recruiting activities that occur prior to any participation in an SMIF.

Structured multi-year training prior to an SMIF also can help optimize the composition of student members. Case studies highlight that SMIF participation often is selective (e.g., Bowers and Lavin, 2012; Carlston et al., 2018; Tashjian, 2019; Ascioglu and Maloney, 2020). The University of Utah SMIF, for instance, only accepts roughly half of the students who interview for the program and seeks applicants with a “demonstrated interest in finance and business strategy,” “curiosity about business and markets,” and “ability to collaborate effectively” (Tashjian, 2019). To the extent students have opportunities early in their academic careers to demonstrate related competence, interest, and commitment, the likelihood increases that the SMIF will admit the best candidates. Conversely, early training and exposure gives students a stronger basis for determining if SMIF participation is best for them – prior to those students taking up the limited available positions.

Another benefit of a structured multi-year training program is the potential to reduce inconsistent investment strategies that result from the high turnover rate of portfolio managers (PMs). Lin (2022) notes that most SMIFs have high portfolio turnover because of the constant change in PMs every year, as incoming students may inherit previous purchases without fully understanding the previous PM's rationale in making the purchase. Without that background knowledge, and consistent with the current managers' desire to leave their own mark on the fund, those holdings may be sold before having had a chance to meet the fund's expectations. By structuring a multi-year training program that requires incoming PMs to first work as analysts with the current PMs, the incoming PMs will have more insight into the SMIF's portfolio and make better informed investment decisions.

THE WILDCAT FUND AT VILLANOVA UNIVERSITY

Overview

The Wildcat Fund at the Villanova School of Business is a long-only equity fund that was created in 2019 as an outgrowth from a student-run investment club known as the Equity Society that had been formed in 2015. The initial \$1 million in funding for the fund came from alumni. Today, the fund has \$2.1 million assets under management with the additional funds coming from both additional alumni gifts and portfolio growth (Curry, 2024).

Students across any major who have completed the Villanova Investment Academy (VIA) training program—usually as sophomores—deliver a stock pitch before the advisers and, if selected, work as analysts in the Wildcat Fund. Analysts can then apply for two semester-long sequential courses (Student Managed Fund I and II) and become portfolio managers. All investment decisions are made by the student portfolio managers for each of the 11 Global Industry Classification Standard sectors. The fund currently has more than 120 participants, and last year all 24 portfolio managers landed competitive internships at major banks and investment houses.

The fund follows the guidelines for ethical financial stewardship as outlined by the United States Conference of Catholic Bishops, embracing the principles of socially responsible investing (Villanova School of Business, 2025). Such an approach is consistent with Clinebell (2013), who found that the importance of ESG has motivated the structuring of some SMIFs as socially responsible. Todd and Velarde (2024) report that 28% of funds pursue an ESG investment strategy.

The Structured Training Program Behind the Wildcat Fund

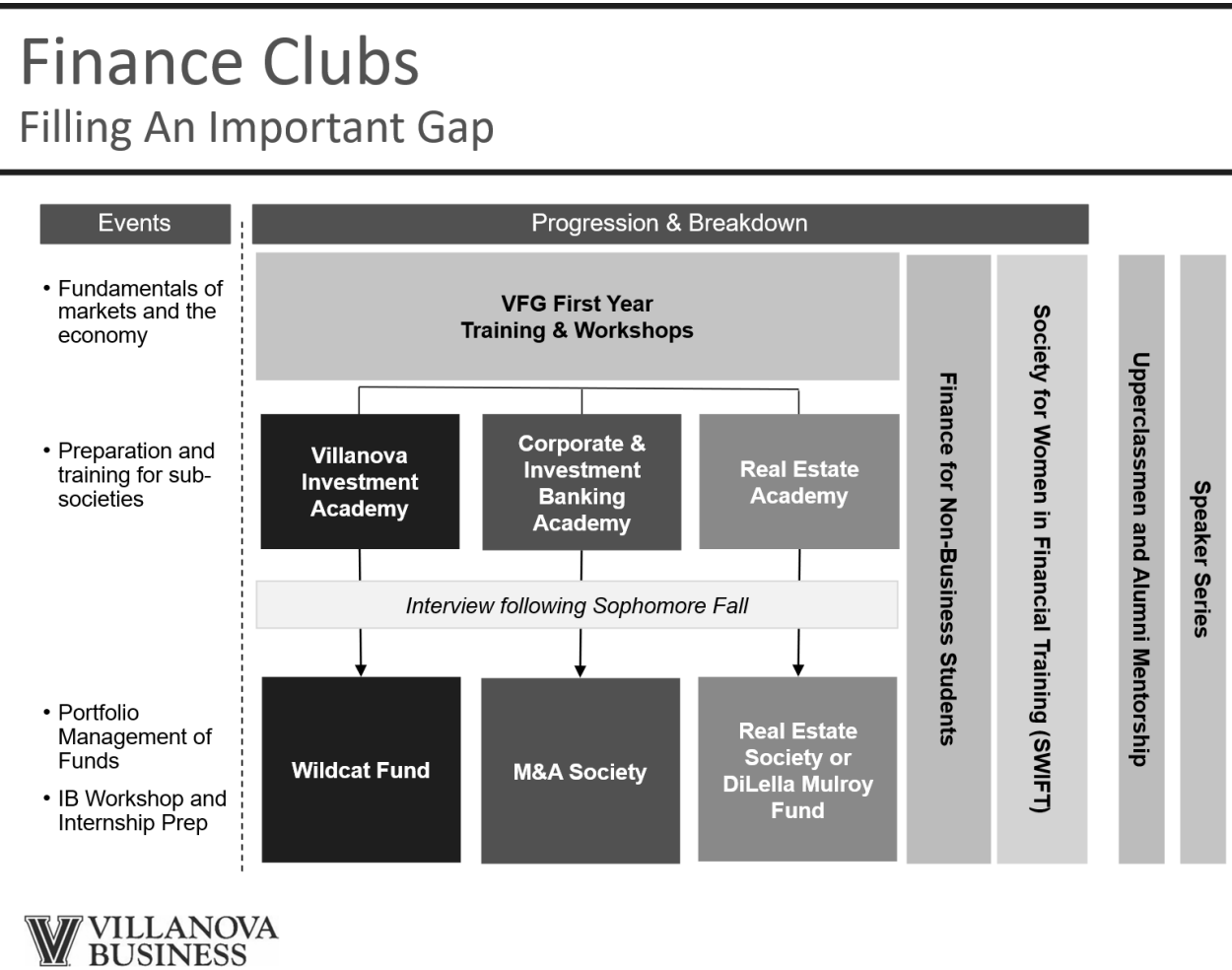
Lin (2022) notes that because SMIFs are experiential learning programs, the academic outcome expectations for an SMIF should be prioritized over the expectations for fund performance. To achieve those expectations, students should

have access to learning opportunities not only in the classroom but also through out-of-class activities such as guest speaker series and investment conference competitions.

One of the keys to the success of the Wildcat Fund, as measured by both its academic and financial outcomes, is the structured training program that forms the foundation for the Wildcat Fund. This training, starting freshman year and continuing through the senior year, includes the types of experiences highlighted by Lin (2022).

Figure 1 provides a visual overview of the structured training program available to students as part of the Villanova Finance Group student organization.

Figure 1: Map of Villanova Finance Group Four-Year Curriculum and Opportunities



First Year Students – Villanova Finance Group

First year students participate in the Villanova Finance Group's (VFG) Monday night training sessions. These sessions cover fundamental finance concepts and offer insight into professional career opportunities in areas such as investment banking, sales and trading, equity research, wealth management, asset management, and corporate finance. A key benefit of starting this training during freshman year is that it helps to prepare students for finance-related internships during the summer between their junior and senior years. While such a time horizon is more than two years away, interviews for such positions take place as early as the end of the first semester during sophomore year. This first-year training enables the students to be much better prepared for the highly competitive interview process.

The curriculum for the first semester focuses on career exploration, utilizing a variety of guest speakers who can discuss each area of finance. Ideally, the guest speakers are alumni with about three years of experience who have accumulated significant experiences similar to what the students will experience early in their careers. The second semester is more academic in nature. Working in teams of 4-5, students are paired with a junior or senior finance

major and utilize case studies to learn about topics such as financial statement analysis, valuation, and fixed income. As students come into the training program with a variety of backgrounds, the sessions assume students have no prior knowledge of the finance topics covered.

Table 1 and Table 2 provide outlines of the sessions for the first and second semester, respectively.

Table 1: Villanova Finance Group First Semester Curriculum

Week 1	VFG Overview & What is Finance
Week 2	Overview of Potential Career Paths in Finance
Week 3	Introduction to Finance & Understanding Stocks
Week 4	“Find Your Path” Project Introduction
Week 5	No Meeting
Week 6	Speaker Series — Sales & Trading
Week 7	Speaker Series — Equity Research
Week 8	Speaker Series — Asset Management & Real Estate
Week 9	No Meeting
Week 10	Speaker Series — Wealth Management
Week 11	No Meeting
Week 12	Speaker Series — Investment Banking
Week 13	Semester Recap and “Find Your Path” Presentations

Table 2: Villanova Finance Group Second Semester Curriculum

Week 1	Time Value of Money
Week 2	Introduction to Valuation & Comparable Analysis
Week 3	Networking and Resume Building
Week 4	Financial Statements and Ratio Analysis
Week 5	Capital Structure with Valuation Metrics
Week 6	No Meeting
Week 7	No Meeting
Week 8	Multiples and Trading Comparables
Week 9	Upperclassmen Panel
Week 10	No Meeting
Week 11	Developing a Tell Me About Yourself & Investment Thesis
Week 12	Subsociety Spotlights
Week 13	Fixed Income Teach-In

Summer Between First and Second Year

During the summer between first and second year, students are encouraged to enroll in selected Wall Street Prep video modules. Wall Street Prep is a well-regarded training tool for finance professionals (Wall Street Prep, 2025). The selected modules for that summer include Excel, PowerPoint, and Financial Statement Modeling. The one-time fee for the program provides students with access to the Wall Street Prep website for the remainder of their time at Villanova University.

Second Year: Academies and Initial Analyst Experience

During the fall semester of sophomore year, students can begin to specialize within VFG’s three academies, diving deeper into their chosen field to gain a more tailored skillset. This structured approach ensures that all members are equipped with the knowledge, skills, and resources necessary to succeed in the competitive world of finance. Students

may opt in to as many of the academies as they desire. All academies are student-led but use curriculum set by the finance faculty. The three academies are:

- Villanova Investment Academy (VIA) which focuses on market-facing jobs, such as equity research, wealth management, and sales and trading
- Corporate and Investment Banking Academy
- Real Estate Academy

VIA is designed to provide the necessary training for students to become part of the Wildcat Fund. Table 3 provides a schedule of the weekly curriculum for VIA. At the end of the fall semester, students apply to be a member of the Wildcat Fund. The application process includes an interview and a stock pitch. If accepted, students then begin as analysts for the Wildcat Fund in the spring of their sophomore year. As analysts, they conduct stock research and prepare and present stock pitches. Students serve as analysts for both their spring sophomore semester and their first semester as a junior.

Table 3: Villanova Investment Academy Weekly Curriculum

Week	Topic	Readings / Wall Street Prep	Deliverables
1	Intro - Overview & Expectations, S&T/ER/Capital Markets & Basic Concepts	Bill Ackman Lemonade Stand Video (first 21 minutes)	A1: Public Filings Scavenger Hunt Q1: Markets Questions 1
2	Public Filings Analysis Accounting - Financial Statement Analysis	WSP Accounting Crash Course: 5, 6, 21, 22, 28	A2: Ratio Analysis Exercise Q2: Accounting
3	Financial Statement Ratio Analysis & Operating Leverage	WSP Accounting Crash Course: 52, 44, 49	A3: Find the Error Exercise
4	Qualitative Analysis		A4: Time-Series and Trading Comps Exercise
5	Time Series Valuation Comparable Analysis Competitive Advantage Economic Moats	WSP Trading Comps Modeling: 3-7	Project 1: Complete Earnings Call Summary
6	Investment Thesis Catalysts Street Expectations Earnings Reports Proprietary Research	Read Earnings Transcripts and WCF Earnings Reports	A5: DCF Analysis Exercise Q3: Valuation
7	Three Statement Financial Modeling DCF Modeling DCF Analysis	WSP DCF Modeling: 3-4, 5-11	
8	Trading Simulator w/ Morgan Stanley	WSP DCF Modeling: 31-32, 50-53, 62	Q4: Markets Questions 2
9	Industry Analysis		Q5: Technical Questions
10	Mini Pitch Preparation & Questions	Read 2-3 Sample WCF Stock Pitches / Slide Overviews	
11	Mini Pitch Office Hours with PMs	Read 2-3 Sample WCF Stock Pitches / Slide Overviews	Project 2: Complete Mini Pitch
12	Mini Pitches	Practice Presentations	
13	Behavioral & Markets Interview Prep & WCF Applications	Review Sales & Trading Technical Interview Guide	
14	Final Pitch Q&A / Flex Week for Anything Else		Final Project: Stock Pitch

The Corporate and Investment Banking Academy is focused on teaching students the fundamentals of corporate finance and investment banking and helps prepare them for internships in these areas via technical teach-ins, behavioral interview preparation, case studies, mock interviews, and alumni mentorship programs. One of the goals of this Academy is to prepare students for their application into the M&A Society, which takes place in the spring of

their sophomore year. Mergers & Acquisitions (M&A) Society upperclassmen play an active role in mentoring underclassmen by assisting with interview preparation, mock internship interviews, and training during the weekly meetings, for the mutual benefit of the mentors and mentees. Students also maintain a Microsoft Teams site that provides information on common interview questions and responses, and templates for networking request emails, thank you emails, and resumes.

The Real Estate Academy provides seminars for sophomores (referred to as interns) interested in learning more about commercial real estate investing and portfolio management. Following participation in the academy, students may elect to apply for the Daniel M. DiLella and Thomas M. Mulroy Real Estate Fund (DiLella Mulroy Fund), a second Villanova SMIF that focuses on direct investments in commercial real estate properties. Some students also participate in the Real Estate Society, where they can explore career options, receive mentorship, and engage in interview preparation (DiLella Mulroy Fund, 2025).

Preparation through the different academies is designed to both enhance the students' knowledge of the finance industry and teach them about available financial tools. While participation in the academies is not mandatory, the training offered by the academies gives students a strong basis for their application into the Wildcat Fund, the M&A Society, the DiLella Mulroy Fund, or the Real Estate Society.

Third Year: Continued Analyst Experience, Coursework, and Portfolio Managers

During the first semester of junior year, members of the Wildcat Fund continue in their role as analysts. As the semester winds down, students apply to be Portfolio Managers (PMs) by applying to take two related courses entitled Student Managed Fund (SMF) I and II for their junior spring semester and senior fall semester, respectively. Twenty-four students are selected to be part of the class, so it is a highly competitive process. Students in the SMF courses are assigned as PMs to a specific sector and oversee the student analysts within their sector.

The Student Managed Fund I course is designed to provide students with firsthand experience managing assets within a Socially Responsible Investing framework. The objective of the class is to familiarize students with many of the financial terms, investment platforms, and methods of research used in the industry. The class covers multiple approaches to investing with a heavy emphasis on bottom-up fundamental analysis. Students familiarize themselves with issues facing specific industries and operating models. In addition, they learn to create and deliver stock pitches on specific companies within their sector. The class also covers general areas within finance, such as investment policy statements, asset allocation, diversification, GIPS, GICS, benchmarks, and behavioral finance. In addition, students work on providing constructive criticism to others on the investment team with the goal of improving the portfolio quality, fund performance, and the quality of student presentations.

Fourth Year: Completion of Coursework and Portfolio Manager Experience

During the first semester of senior year, students in the Wildcat Fund take the Student Managed Fund II course and continue working as PMs managing the fund. The Student Managed Fund II course entails performing deeper research on companies, with a focus on the key drivers of future free cash flow and how fund expectations compare with market consensus. Students learn to challenge conventional wisdom, critically evaluate peers' holdings, and develop professional bear-case responses. They examine historical disruptions to anticipate industry change, explore potential strategic shifts and their financial impact, and analyze how individual holdings interact within the broader portfolio. The course also strengthens skills in presenting research through written and oral reports, while covering additional topics such as shorting, personal finance, compounding, and screening to broaden overall financial knowledge.

A highlight of senior year is a trip to New York City where the portfolio managers present the results of their experience with the Wildcat Fund to the Villanova Finance Department Advisory Council, which includes many top Wall Street executives. The experience provides students with a meaningful opportunity to develop presentation skills and network with alumni.

PMs have no formal responsibilities during the second semester of their senior year, but they are available for support as the new PMs complete the first Student Managed Fund course and transition into their roles.

CONCLUSION

The Villanova Wildcat Fund has been a financial and academic success. Since its inception, the fund is up 82.54%, and it has outperformed the Russell 1000 Index, which tracks the 1,000 top US companies by market capitalization,

by more than 9% (Curry, 2024). During that same period, Villanova placements with top banks in front office jobs have increased significantly, and Villanova has been designated as a core recruiting school with several of those banks.

The Wildcat Fund provides a valuable hands-on learning experience for students hoping to pursue a career in finance, enabling them to bridge classroom theory with real world practice. In addition, the Wildcat Fund promotes analytical decision making and provides opportunities for students to improve their teamwork, entrepreneurship, and leadership skills. The four-year structured training program described in this paper culminates in students acting as PMs of the Wildcat Fund and plays a key role in the fund's overall success.

Looking ahead, the Villanova Finance faculty are exploring the possibility of starting a separate fixed income fund. Similarly, VFG members are always exploring opportunities to expand the program. For example, VFG students have engaged with the public by providing financial literacy training, providing the students with another meaningful forum for implementing the knowledge and skills obtained through the organization.

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You Be the Detective:

Pondering Financial-Reporting Conundrums and Business Actions

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ABSTRACT

This article presents six financial-reporting conundrums and business actions for analysis. We include four instances in which the relationships among a firm's data seem to defy logic and two situations in which firms' actions appear likely to harm their businesses. As student detectives address the discussion questions provided, what they learn include how firms collect on charge accounts before customers remit payments, when negative retained earnings does not signal financial distress, why a firm might include sixteen weeks in a financial quarter, and what could prompt a firm to voluntarily increase its income taxes. This knowledge enables students to make sense of financial data and business actions that might seem to be suspicious, inaccurate, or dysfunctional at first glance. A teaching note provides suggested answers, learning takeaways, and follow-up discussion points for instructors.

Keywords: deciphering unusual financial data and business events

INTRODUCTION

Much of the time when relationships among the data in a firm's financial statements are examined and the actions undertaken by businesses are studied, what one observes makes sense. On occasion, however, one needs to do some detective work to decipher what appears to be a very puzzling situation. In this article, the following financial-reporting conundrums and business actions are presented for analysis:

Financial-Reporting Conundrums:

1. How can it appear that one firm's charge customers paid off their accounts within a few days of their purchases?
2. How could a sharp decline in a firm's stock price occur just months after record sales and income were reported?
3. How did a consistently profitable firm come to report \$2.8 billion of negative retained earnings?
4. What can explain the seasonal sales performance reported by a non-seasonal firm?

Business Actions:

5. Why would analysts pressure a firm to take an accounting action that would increase taxes and harm cash flow?
6. How can some firms take longer than others to sell their merchandise without adverse cash-flow effects?

In the pages that follow, descriptions of these puzzling situations enable students to become detectives as they address the questions raised above.

FINANCIAL-REPORTING CONUNDRUMS

1. Surprisingly speedy payments on customers' accounts

It was March 2007 and your classmate Jessica had just paid off the balances on her Costco and Target credit cards. Her credit purchases were made evenly throughout the month and thus they occurred on average about fifteen days before she received the monthly statements online. To avoid paying interest, Jessica made sure the retailers received the full amount owed within two weeks of when their statements arrived. Therefore, she estimated that receivables relating to her credit purchases remained on the retailers' books for an average of twenty-nine days ($15 + 14$).

Out of curiosity, Jessica wondered how her payment time frame compared with the collection periods experienced by Costco and Target for all their customers. Accessing the firms' most recent 10-Ks, she proceeded to calculate the days' sales in accounts receivable (DSAR) for each firm. Data she accessed and calculations she made appear in Table 1:

Table 1: Days' Sales in Accounts Receivable for Two Retailers

Financial Measures for 2006	Costco	Target
Sales Revenue	\$58,963,180,000	\$57,878,000,000
Average Accounts Receivable	\$547,261,500	\$5,930,000,000
Days' Sales in Accounts Receivable*	3.4 days	37.4 days

*DSAR = Average accounts receivable / (sales revenue/365 days)

Upon examining the above data, Jessica was puzzled. Given that Costco and Target attracted many of the same customers, she reasoned that they would be about equally successful at collecting on a timely basis amounts owed on charge purchases. “How could two retailers with almost identical sales revenue report accounts-receivable totals that differed by over \$5 billion?” she wondered. “And despite the fact that DSAR is thought of as measuring how quickly customers pay off their accounts, Costco’s customers simply couldn’t be paying off their accounts within 3.4 days of their charge purchases, could they?” she asked herself. Jessica did observe on the back of her Costco card a disclosure that it is administered by, and the property of, Citibank. No such reference to a bank appeared on the Target card. Perhaps this offered a clue to solving the puzzle.

Discussion Questions:

1. What financial arrangement could Costco have with Citibank that could explain the low balance of accounts receivable on Costco’s books? And if the receivables were not on its books, were they on anyone’s books?
2. Do Costco’s and Target’s DSARs reflect how quickly those firms’ charge customers paid off their accounts in 2006? Explain.

2. A sharp decline in a firm’s stock price

The stock of Coleco, a toy manufacturer, was the top performer among Fortune 500 firms in 1982, achieving a total return to investors (stock price change + any dividends) of 434.9% for that year (Fortune, 1983). The price appreciation continued into 1983, with the firm’s stock hitting \$65 per share by June, up from just \$7 some ten months earlier. Financial results reported in the firm’s Quarter 2 SEC Form 10-Q included those shown in Table 2:

Table 2: Financial Data Reported by Coleco

	Quarter End 6/30/82	Quarter End 7/2/83		Six Months End 6/30/82	Six Months End 7/2/83
Net Sales	\$86,801,000	\$126,338,000		\$141,540,000	\$306,508,000
Net Income	\$7,437,000	\$9,065,000		\$11,957,000	\$25,275,000

In its reporting, Coleco adhered to the required format for quarterly reports, in which the current quarter and year-to-date totals are compared only with the corresponding periods of the prior year. When commenting on the above data in July 1983, the firm’s CEO proudly noted – correctly – “that sales and earnings for Quarter 2 and the first half of 1983 were greater than those for any prior comparable periods” (Coleco Interim Report, 1983). Four months earlier, in March 1983, he had told a Fortune reporter that “1982 was just a warm-up for 1983 ... because the firm has become a terror in the marketplace” (Mesdag, 1983).

Therefore, it must have come as a great surprise to many Coleco investors when the firm’s stock proceeded to lose fifty percent of its value by the end of August 1983, less than two months after its record-breaking performances were celebrated (Investing Answers Experts, 2020). Nevertheless, among those *not surprised* was your classmate Robert, who stated that his “careful reading of the data in Coleco’s 10-Q showed that net sales and net income had declined substantially from Q1 to Q2 in 1983.”

Discussion Questions:

1. Did net sales and net income decline substantially from Q1 to Q2 in 1983? Show calculations.
2. By what percentages did net sales and net income change from Q1 to Q2 in 1982? Show calculations

- Are your findings in (1) alone sufficient for Robert not to be surprised by the change in sentiment toward the firm's stock, or is it the combination of your answers in (1) and (2) that better justifies his viewpoint? Explain.

3. Large profits, but billions of negative retained earnings

O'Reilly Automotive has established itself as a growing, profitable auto parts retailer. Over the 1994-2024 period, its net income grew from \$11.1 million to \$2.4 billion – a compound annual rate of over 17%. During this period, O'Reilly's net income increased in every year except one. Nevertheless, in early 2025 a friend asked you to help him make sense of one surprisingly negative amount contained in O'Reilly's 12/31/2024 balance sheet.

What puzzled your friend was O'Reilly's negative retained earnings of \$2.8 *billion*. Adding to the puzzle, the negative balance had been “only” a negative \$1.4 billion at 12/31/2021 – and yet, all that had occurred since then were three years of record profits! “It seemed that the more profitable the firm became, the more negative its retained earnings became -- clearly the reverse of what one would expect,” your friend noted.

Discussion Questions:

- Access both O'Reilly's Statement of Changes in Stockholders' Equity and Balance Sheet in the 10-K it filed on 2/28/2025. What annual action/event undertaken during the 2022-2024 period led to the doubling of its negative retained earnings and to its stockholders' equity becoming negative?
- Why would O'Reilly's ever-increasing negative retained earnings *not be of concern* to Wall Street?

4. A quarter for your thoughts

It was April 2025 and your housemate, Jessica, had just received a birthday gift of ten shares of Red Robin stock from her parents. Red Robin remained her favorite place from which to have food delivered. However, DoorDash deliveries also came frequently to her from Wendy's and Domino's. Out of curiosity, she decided to compare the recent revenue trends for these firms, which all ended their fiscal years near December 31. She knew that while some firms did report internally in four-week cycles, for external reporting the SEC required that they file quarterly (10-Q) and annual (10-K) reports. Jessica's findings for 2023 and 2024 are shown in Table 3.

Table 3: Reported Quarterly and Annual Sales Data for Three Restaurants for 2023 and 2024

2023	Red Robin's Sales	% of Annual Sales		Wendy's Sales	% of Annual Sales	Domino's Sales	% of Annual Sales
Q1	\$417,968,000	32%		\$528,807,000	24%	\$1,024,398,000	23%
Q2	\$298,648,000	23%		\$561,565,000	26%	\$1,024,627,000	23%
Q3	\$277,560,000	21%		\$550,555,000	25%	\$1,027,361,000	23%
Q4	\$308,870,000	24%		\$540,651,000	25%	\$1,402,972,000	31%
Total	\$1,303,046,000	100%		\$2,181,578,000	100%	\$4,479,358,000	100%
2024	Red Robin Sales	% of Annual Sales		Wendy's Sales	% of Annual Sales	Domino's Sales	% of Annual Sales
Q1	\$388,541,000	31%		\$534,753,000	24%	\$1,084,647,000	23%
Q2	\$300,154,000	24%		\$570,727,000	25%	\$1,097,736,000	23%
Q3	\$274,638,000	22%		\$566,739,000	25%	\$1,080,119,000	23%
Q4	\$285,227,000	23%		\$574,273,000	26%	\$1,443,914,000	31%
Total	\$1,248,560,000	100%		\$2,246,492,000	100%	\$4,706,416,000	100%

Upon examining the Table 3 findings, Jessica was immediately puzzled by the sizable differences in the seasonal sales patterns reported by the firms. Revenue at Wendy's showed only slight variations among the four reported quarters. However, at Red Robin a surprising proportion of its annual sales were reported in Quarter 1, while a surprising proportion of Domino's annual sales were attributed to Quarter 4.

This seemed odd to Jessica who remarked that “my need for burgers and pizza is not concentrated in the earlier or later months of the year and I can’t imagine that anyone else’s is either.” Nevertheless, she continued, “the fact remains that difficult-to-explain quarterly sales patterns appear to be occurring regularly at Red Robin and Domino’s. Still, I can’t believe that these two firms generated almost thirty-five percent more business in their Q1 and Q4, respectively, than they did in each remaining quarter of 2024,” she concluded ($31\% \text{ of annual sales} / 23\% = 1.348$).

Discussion Questions:

1. Do you agree with Jessica that sales for burgers and pizza would be relatively constant from quarter to quarter? Explain.
2. In light of your answer in (1), what action would Red Robin and Domino’s have had to take to report approximately thirty-five percent more revenues in their Q1 or Q4 than in each remaining quarter?
3. Explain how the action your cited in (2) could prove beneficial to firms?
4. Firms’ quarterly financial reports are sometimes referred to as “interim reports.” In light of the actions of Red Robin and Domino’s, might that description not only be an acceptable alternative but perhaps a more accurate one as well? Explain.

BUSINESS ACTIONS

5. Opting to Pay More Income Taxes

As of late 1969, Chrysler continued to be the lone Big-Three automaker using the LIFO inventory method for accounting purposes. Although LIFO lowered a firm’s net income during a period of rising prices (by expensing the latest manufacturing costs first), it also legally lowered a firm’s income-tax liability. Saving taxes and enhancing cash flow was viewed by an increasing number of firms as well worth the reporting of lower net income to stakeholders and the “parking” of the oldest product costs in inventory on the balance sheet.

Therefore, one might have wondered why auto analysts succeeded in forcing Chrysler to switch back to FIFO, effective January 1, 1970. When the FIFO method is used for accounting purposes, a firm’s inventory is considered to consist of the latest product costs, because first-in, first-out equates to last-in, still-here. With a switch to FIFO, a firm’s cost of goods sold would be reported lower and its net income would be reported higher from that point on. In 1970, Chrysler’s loss was reduced \$20 million by its switch to FIFO (Wall Street Journal, 1971). Unfortunately, IRS regulations required Chrysler to pay taxes on the income it had deferred when it had reported higher cost of goods sold and lower net income while on LIFO. This saddled the firm with a \$53 million tax assessment, payable over twenty years (Wall Street Journal, 1971).

Discussion Questions:

1. Which liquidity ratio of likely concern to auto analysts may have substantially improved as a result of Chrysler’s switch from LIFO to FIFO?
2. Did the result you cited in (1) in fact change the firm’s liquidity? Explain
3. Was the financial position of auto analysts and Chrysler’s other stakeholders enhanced by its switch from LIFO? Explain.

6. Long inventory holding periods without adverse cash-flow effects

Two of your classmates, Charlie and Rick, recently calculated and compared days’ sales in inventory for three retailers for 2014 and 2024 (see Table 4). All three firms had outsourced their accounts-receivable operations to banks.

Table 4: Days' Sales in Inventory for Three Retailers

Firm	Fiscal Year	DSI*	Compared to Costco		Fiscal Year	DSI*	Compared to Costco
Target	2014	61 days	31 additional days		2024	59 days	30 additional days
Best Buy	2014	62 days	32 additional days		2024	54 days	25 additional days
Costco	2014	30 days	0 days		2024	29 days	0 days

*DSI = Average inventory / (cost of goods sold/365 days)

After examining the above data, Charlie was concerned about the DSIs for Target and Best Buy. “One would think that taking twenty-five to thirty-two more days than Costco to sell merchandise would have adverse cash-flow effects,” he stated. “Not necessarily” Rick responded, “for if Target and Best Buy were able to take as long to pay their suppliers as it took them to sell their merchandise, it’s almost as if their customers are paying their suppliers, eliminating any negative cash-flow effects.” “But Rick,” Charlie pointed out, “you seem to be assuming the firms received cash at the time of each credit sale, which is long before customers even got their credit card statements,” “I can assume so,” Rick responded, “because these retailers had outsourced their AR operations and thus received payment from the banks very close to the time that their customers made charge purchases.”

“How would the time firms take to pay their suppliers be measured?” Charlie asked. “By calculating the days’ purchases in accounts payable (DPAP), as follows,” Rick responded:

$$\text{DPAP} = \text{Average accounts payable} / (\text{purchases}^*/365)$$

(*purchases = cost of goods sold + ending inventory - beginning inventory)

Charlie and Rick then proceeded to calculate the DPAP for each retailer. Their results are shown in Table 5 along with the DSIs that were shown in Table 4. For comparison purposes, calculations were made for 2014 and 2024.

Table 5: Firms’ DSIs and DPAPs

Firm	2014 DSI	2024 DSI		2014 DPAP	2024 DPAP
Target	61 days	59 days		53 days	59 days
Best Buy	62 days	54 days		60 days	54 days
Costco	30 days	29 days		30 days	30 days

Discussion questions:

1. For 2014 and 2024, calculate the excess of DSI over DPAP for each retailer.
2. By 2024, to what extent had Target and Best Buy succeeded in holding off payments to their suppliers until the merchandise purchased from them had been sold?
3. How did Target and Best Buy differ in the steps they took to achieve the outcomes you cited in (2)?
4. How did the firms’ actions in (2) avert negative cash-flow effects for them?

TEACHING NOTE

Student Audiences

Students should be comfortable with the calculation and purpose of the financial measures defined and featured therein (current ratio, days’ sales in accounts receivable, days’ sales in inventory, and days’ purchases in accounts payable) and the major components of stockholders’ equity (paid-in capital, retained earnings, and treasury stock). In addition, they should be able to search online for financial statements contained in firms’ 10-Ks. This exercise can be used in Intermediate Accounting courses and in Financial Statement Analysis classes at the undergraduate and graduate levels. In

addition, it can serve as a capstone assignment near the end of a higher-level Introductory Accounting course or as part of an accounting module in a Corporate Finance course.

Time Commitment

This exercise can easily be divided into its six parts -- covering the four financial-reporting conundrums and two business actions contained therein. During each of six classes, students could break out into teams for fifteen or twenty minutes to collaborate on the issue covered that day. Conclusions reached by the various teams could then be compared and contrasted in class. Of course, depending on the level of the course and the topics covered therein, the instructor could choose to cover several, but not all, of the six puzzles that are presented here.

On the other hand, the entire exercise can be given out as a homework assignment to individuals or teams. Most students should complete this exercise in ninety minutes, with the time divided equally between reading the text and addressing the discussion questions. A follow-up class conversation could take fifty minutes, especially if students are prompted to defend their answers on the discussion questions and the instructor pursues the follow-up discussion points provided.

Suggested Answers, Learning Takeaways, and Follow-up Discussion Points

1. Surprisingly speedy payments on customers' accounts:

Suggested Answers:

1. When Costco's customers use their Citibank Costco card to charge, they in effect are taking out a loan from Citibank. The customer receivables move from Costco's books to Citibank's and the bank electronically transfers the amount owed by the customer to Costco (less a service fee). When customers pay off their accounts, they are actually paying Citibank -- for Costco has already been paid.

No mention of bank involvement appeared on Target's credit card in 2006 because that retailer kept its AR operation in-house until it was outsourced to TD Bank seven years later (TD Bank, 2013).

2. For the reasons cited in (1), Costco's 3.4 DSAR reflects how quickly Citibank advanced cash to the firm for customers' credit purchases, not how quickly customers themselves paid off their accounts. For Target, however, its 37.4 DSAR does reflect how quickly on average its customers paid off their accounts, since it had not yet outsourced its accounts-receivable operation.

Learning Takeaway: The days'-sales-in-accounts receivable metric is best considered as a measure of how quickly firms collect on customer accounts rather than a measure of how quickly customers themselves make payments on their accounts. This alternative view of what the metric measures is sufficiently broad to apply regardless of whether or not the firm has outsourced its accounts-receivable operation.

For follow-up discussion with students: Since 2013, with both retailers' accounts-receivable operations outsourced, their DSARs have been similar. In 2024, for example, DSARs were 3.7 days for Costco and 3.2 days for Target.

2. Sharp decline in a firm's stock price:

Suggested Answers:

- 1 & 2. As shown in Table 6, Coleco's net sales and net income declined substantially from Q1 to Q2 in 1983, in sharp contrast to the hefty increases experienced during that period in 1982.
3. It is the combination of the findings in (1) and (2) that justifies Robert's viewpoint. Only by learning that the declines in net sales and net income from Q1 to Q2 in 1983 *were not an annual occurrence* can one conclude that Coleco's performance took a significant turn for the worse in Quarter 2 of 1983.

Learning Takeaway: Commendable efforts to factor out seasonality in quarterly reporting need not obscure important recent trends in sales and net income. Current-quarter results must continue to be compared with those of the same quarter in the prior year to factor out seasonality. But recent trends can become apparent if, as shown in the answers to (1) and (2) above, the current quarter is then compared to the immediately preceding quarter in an analysis that covers *two consecutive years*.

Table 6: Coleco's Performance in Quarter 1 vs. Quarter 2 of 1982 and 1983

	Six Months Ended 6/30/82	Q 2, 1982	Q 1, 1982*	% Change from Q1 to Q2 in 1982
Net Sales	\$141,540,000	\$86,801,000	\$54,739,000	+58.6%
Net Income	\$11,957,000	\$7,437,000	\$ 4,520,000	+64.5%
	Six Months Ended 7/2/83	Q 2, 1983	Q 1, 1983*	% Change from Q1 to Q2 in 1983
Net Sales	\$306,508,000	\$126,338,000	\$180,170,000	-29.8%
Net Income	\$25,275,000	\$9,065,000	\$16,210,000	-44.1%

*Equal to data for the first six months minus data for Quarter 2.

For follow-up discussion with students: The financial woes that began for Coleco in Quarter 2 of 1983 continued for the remainder of that year. The firm reported a *net loss of \$7.4 million* for 1983, even though it had earned \$25.3 million in *net income* over the first six months. By 1986 and 1987, Coleco's annual net losses exceeded \$100 million as the markets for its Cabbage Patch Dolls and electronics plummeted. By mid-1988, the firm had filed for Chapter 11 bankruptcy and it liquidated the business shortly thereafter (Bruner and Opitz, 2008).

3. Large profits, but billions of negative retained earnings:

Suggested Answers:

1. Like many corporations, O'Reilly regularly makes treasury stock purchases, acquiring at prevailing market prices shares it had previously issued. O'Reilly's buy-back activity has been especially large. Since the program began in 2011, the firm has bought back over *ninety-six million shares* (O'Reilly, 2025).

If O'Reilly had held onto the shares it bought back, pending a future decision on whether to reissue or retire them, its stockholders' equity would have been reduced but its retained earnings would not have changed. At O'Reilly, however, *all shares reacquired were promptly retired*. Because the shares retired had been bought back for much more than their original issue price, the sizable losses incurred substantially reduced O'Reilly's retained earnings.

As seen on the Consolidated Statement of Shareholders' Equity in O'Reilly's 2024 10-K and shown in Table 7, the firm's losses on treasury stock retirements far exceeded its net income in 2022 and 2023. Over the 2022-2024 period, the net excess was \$1.379 billion and the firm's negative retained earnings doubled, reaching nearly \$2.8 billion by 12/31/2024. Despite O'Reilly's \$1.5 billion of paid-in capital on its 12/31/2024 balance sheet, it is not surprising that it reported negative stockholders' equity, given its huge negative retained earnings.

Table 7: Factors Affecting O'Reilly's Retained Earnings Balance, 2022 to 2024

Date or Year	Shares Retired	Retirement Losses	Net Income	Retained Earnings Became	Retained Earnings
12/31/21					(\$1,365,802,000)
2022	4,961,000	\$3,182,708,000	\$2,172,650,000	\$1,010,058,000 more negative	
2023	3,568,000	\$3,073,423,000	\$2,346,581,000	\$726,842,000 more negative	
2024	1,936,000	\$2,029,425,000	\$2,386,680,000	\$357,255,000 less negative	
2022-24	10,465,000	\$8,285,556,000	\$6,905,911,000	\$1,379,645,000 more negative	
12/31/24					(\$2,791,288,000)*

*Other items of (\$45,841,000) also increased the negative balance of retained earnings over the 2022-2024 period

2. O'Reilly's negative retained earnings came about because the firm chose to buy back over ninety-six million shares; it did not result from poor earnings performance. The firm pleased Wall Street with impressive earnings growth and cash in such abundance that it could engage in an aggressive share-buy-back program. Earnings growth and a reduced number of outstanding shares set the stage for higher earnings

per share and higher stock prices. Over the 2022-2024 period, O'Reilly's earnings per share increased by 31% and its stock price per share rose by 70% (Macro Trends, 2025).

Learning Takeaway: Caution is needed before one attempts to infer the cause of a firm's negative balance of retained earnings. Low or negative retained earnings occur not only among firms that regularly incur sizable net losses but also among consistently profitable firms that incur sizable losses on their retirements of treasury stock.

For follow-up discussion with students: In addition to often boosting earnings per share and market price, other benefits of stock buybacks can include making takeovers more difficult and providing tax advantages to shareholders. These benefits occur without a "hit" to retained earnings if the shares bought back are held in the treasury rather than retired. But in O'Reilly's case, it would be unrealistic to expect the firm to hold on to the ninety-six million shares.

4. A quarter for your thoughts:

Suggested Answers:

1. Jessica's viewpoint seems reasonable. Fine restaurants could see an uptick in the fourth quarter due to bookings for end-of-year holiday parties and restaurants in vacation spots would be much busier during tourist season. But sales for nation-wide burger and pizza establishments would likely show very little quarterly variation in sales during the year.
2. With little variation in sales during the year, approximately thirty-five percent more sales would be reported for Red Robin during Q1 and Domino's during Q4 only if those firms were to include approximately *thirty-five percent more weeks* in those quarters. This would translate into dividing the 52-week year into one supersized quarter of sixteen weeks and, by default, three quarters of twelve weeks each ($16/12 = 1.33$).
3. Although Red Robin, Domino's, and others with supersized quarters are silent with respect to the reasons for them (Fahey, 2017), a firm with four-week internal reporting periods could find it beneficial to have for external reporting a year with one quarter of sixteen weeks and three quarters of twelve weeks. A firm reporting only thirteen-week quarters cannot evenly divide any quarter into complete four-week segments. But this syncing will occur for *all* quarters when their lengths are either sixteen or twelve weeks.
4. Given that one definition of interim is "intervening time" while quarter usually is suggestive of "one fourth," the former term could lead to less confusion when firms' external "quarterly reports" include quarters of different lengths.

Learning Takeaway: To sync with their four-week internal-reporting cycles, some firms allocate their annual sales into one quarter of sixteen weeks and three quarters of twelve weeks each. Where this occurs, caution is needed when comparing their quarterly sales trends with those of peers who report externally using four quarters of thirteen weeks each.

For follow-up discussion with students: Additional firms that report externally with one supersized quarter include Kroger, PepsiCo, Jack in the Box, Costco, and AutoZone. When these firms' quarterly sales patterns are compared with those of peer firms whose quarters are thirteen weeks each, caution is needed.

Another benefit of a supersized Q1 could relate to the variable timing of Easter, which always occurs between March 22 and April 25. A sixteen-week Q1 would guarantee much more accurate year-to-year quarterly financial comparisons at firms that get a substantial revenue boost from Easter sales. Those added revenues would then be included in Q1, regardless of whether Easter occurred in March or April.

5. Opting to Pay More Income Taxes:

Suggested Answers:

1. Auto analysts were concerned about the low levels of Chrysler's working capital and its current ratio. By switching from LIFO to FIFO, Chrysler restated its inventory amount to reflect the higher costs associated with its more recent production rather than the lower costs of products made many years ago. As a result, the firm's merchandise inventory and current assets increased by \$150 million (Wall Street Journal, 1971).

- Chrysler's switch to FIFO made it *appear* as if it had \$150 million more in merchandise inventory and current assets, but, in fact, no change had occurred in the physical units in inventory or their collateral or market value. The firm's working capital level and current ratio now came closer to reflecting the inventory's current value, but its liquidity *did not change at all*.
- One might question how the financial position of Chrysler's stakeholders was enhanced when the firm became obligated to the IRS for the taxes on \$150 million that it had *legally* shielded from taxation. The firm's net loss narrowed, but it voluntarily worsened its cash flow – and it is cash rather than net income that pays the bills.

Learning Takeaway: Stakeholders' fixation with inflexible ratio expectations can create situations in which firms act counter to their own best interests *and* those of the stakeholders. This was perhaps best illustrated when a struggling firm was pressured to *voluntarily* increase its tax bill by \$53 million in order to report the larger working-capital balance and higher current ratio its stakeholders desired.

For follow-up discussion with students: By the late 1970s, Chrysler had switched back to LIFO. Many major corporations, including Ford and GM, switched to LIFO during the 1970's in response to the high inflation that had been occurring. From their perspective, there were now more income taxes to legally save by expensing today the current, much higher product costs.

6. Long inventory holding periods without adverse cash-flow effects:

Suggested Answers:

- Each retailer's excess of DSI over DPAP is shown in Table 8. For reference, the DSIs reported in Table 4 are repeated in this table.

Table 8: Three Retailers' Excess of DSI over DPAP during 2014 and 2024

Year		2014				2024	
Firm	DSI	DPAP	DSI - DPAP		DSI	DPAP	DSI - DPAP
Target	61	53	8 days		59	59	0 days
Best Buy	62	60	2 days		54	54	0 days
Costco	30	30	0 days		29	30	-1 day

- By 2024, both Target and Best Buy had completely eliminated the excesses of DSI over DPAP that existed ten years earlier. They had been eight days and two days, respectively, in 2014.
- Most of Target's elimination of its eight-day excess resulted from the firm taking longer to pay its suppliers (59 vs. 53 days). The remainder came from holding inventory for a shorter period of time (59 vs. 61 days). At Best Buy, however, suppliers were paid six days sooner in 2024 than they had been in 2014. Despite this, the firm eliminated its excess of DSI over DPAP by holding inventory for eight fewer days in 2024.
- Retailers who have outsourced their accounts-receivable operations receive payments from a bank shortly after their customers make charge purchases. As a result, if the firm can hold off paying for its merchandise until those goods are sold (i.e. $DSI = DPAP$), it will receive cash from the bank for its customers' credit purchases concurrent with when payments must be made to its suppliers. Then, as noted earlier, it's almost as if the firm's customers are paying its suppliers, eliminating any adverse cash-flow effects.

Learning Takeaway: Powerful retailers are often able to mitigate the adverse cash-flow effects of a high days' sales in inventory by delaying payment to suppliers until their customers have purchased the merchandise. When evaluating the cash flow effects of a firm's dealings with its suppliers, its days' sales in inventory can best be assessed only in the context of its days' purchases in accounts payable.

For follow-up discussion with students: Although Target and Best Buy had excesses of DSI over DPAP in 2014, those excesses had been much larger (less favorable) in past years. As shown in Table 9, over the 1994-2014 period Target

reduced its excess of DSI over DPAP by thirteen days and Best Buy reduced its excess by thirty-five days. For both retailers, almost all the improvement came from taking longer to pay suppliers, not selling merchandise more quickly.

Table 9: Reductions in Two Retailers' Excess of DSI over DPAP, 1994 to 2014

Year		1994			2014		
Firm	DSI	DPAP	DSI - DPAP		DSI	DPAP	DSI - DPAP
Target	62	41	21 days		61	53	8 days
Best Buy	64	27	37 days		62	60	2 days

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Artificial Intelligence: Friend or Foe? Academe's Battle for Academic Integrity

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ABSTRACT

The rapid development of artificial intelligence is a blessing and a curse. Our ability to access volumes of information with the mere touch of a keyboard creates new opportunities for every industry and person. The education industry is one of the AI beneficiaries in terms of research, writing, and digital tools for the classroom. As with anything new, however, there can be unintended consequences such as the erosion of academic integrity. This paper delves into the significance of academic integrity, which is the foundation of academe. It explores the mindset of students regarding cheating, and the methods they utilize to accomplish it. This includes large language models (LLMs), with our primary focus on ChatGPT, as a cautionary tale of its dangers when used as a tool for cheating. Improper usage prevents ethical student learning and, ultimately, can lead to a willingness to compromise ethics in the workplace. If the goal of academia is to use artificial intelligence to improve teaching and learning, we must come to terms with the enormous potential for it to become a technological ethical wildfire that will be impossible to extinguish.

INTRODUCTION

In this paper, we conduct a conceptual examination of the prevalence of cheating in academe through a literature review. Particular attention is given to the rise of large language models (LLMs), specifically ChatGPT, as an aider and abettor of those prone to academic dishonesty.

THE MORAL FOUNDATION OF ACADEMIC INTEGRITY

Although the wording may vary, every university in America likely has an academic integrity statement to put students on notice that cheating will not be tolerated. Simply stated, academic integrity means students have done their own work and given credit when they use the work of others (Harvard Library, n.d.). To better understand the significance of academic integrity, one need only recall the ethical guidance provided by the German philosopher Immanuel Kant in his *Groundwork of the Metaphysics of Morals*, first published in 1785 (Shatz, n.d.). Kant was extremely disciplined, and some called him 'the Konigsberg clock' due to his meticulous nature. "On teaching days, when he emerged from his house, people knew it was exactly eight o'clock. At ten to eight, he had put on his hat; at five to eight, he had picked up his stick; and at dead on eight, he stepped out of his door" (Merrick, 2015). This vignette about Kant explains his famous categorical imperatives, which are commands or moral laws all persons must follow, regardless of their desires or extenuating circumstances (Muscente, 2020). One such categorical imperative espoused by Kant is the principle, in which one should "act only in accordance with that maxim through which you can, at the same time, will that it become a universal law" (Muscente, 2020). In other words, what would happen if every individual made that same choice (Shatz, n.d.)? Would the outcome be positive or negative? If the outcome is going to be negative, one should not do it despite one's extenuating circumstances. If Kant's principle is applied to cheating, it becomes clear that if everyone cheats at a university, it creates a negative outcome. No number of excuses would allow for it, because if everyone cheats, the achieved degree would be meaningless and thus would have no value. If a degree has no value, why would a student want to attend a university at all? Kantian logic highlights the critical nature of academic integrity and why it should be taken seriously by both faculty and students. This begs the question: is it being taken seriously?

THE PERVASIVENESS OF ACADEMIC CHEATING

Dr. Donald McCabe helped create the International Center for Academic Integrity (ICAI) and is widely regarded as the founding father of research on academic integrity (Rutgers University-Newark, 2014). The results of the research conducted by Dr. McCabe and others at the ICAI were startling. Ninety-five percent of the 70,000 high school students surveyed confessed to cheating in some form, as did 60% of college students (McCabe, 2005). In a similar poll conducted at Fordham University, a significant gap was observed in grade point averages between cheating students and their honest counterparts. Cheaters, on average, boast a 3.41 average while non-cheaters average 2.85 (Open Education Database, n.d.). Who said cheaters never win? If these results are even close to accurate, it should be a wake-up call to educators everywhere: even our top students have lost their ethical footing.

To discourage academic cheating, the Educational Testing Service (ETS) and the Ad Council created an academic fact sheet that provides more insight into the mindset of cheating student bodies. A Stanford faculty member (Jaffe 2020) reposted the academic cheating fact sheet produced by Educational Testing Services.

A portion of their findings includes:

- There are virtually no differences in cheating between men and women in college.
- Cheating no longer carries the stigma it once did. Less social disapproval, coupled with increased competition for admission into universities and graduate schools, has made students more willing to do whatever it takes to get an A.
- The profile of college students who are more likely to cheat includes: business or engineering majors, and those whose plans include business.
- Cheating does not end at graduation. For example, resume fraud is a serious issue for employers concerned about the level of integrity of new employees.
- Grades, rather than education, have become the major focus of many students.

Therein may lie the crux of the problem. Educators and American society have become too performance-oriented rather than knowledge-oriented. Rather than seeing university attendance as a tremendous opportunity to learn, students are merely checking a box to get the degree, and they are willing to take the easiest route to do so. The Ad Council and ETS believe that the motivation to cheat can start as early as elementary and middle school (Jaffe, 2020). After kindergarten, teachers, parents, and administrators place much greater emphasis on grades and awards, putting considerable pressure on students to do whatever it takes to stay ahead of their peers (Open Education Data, n.d.). As students get older and the stakes get higher with prize internships and coveted jobs on the line, they may see cheating as a necessary evil. “If students believe that their success will be evaluated mostly by GPA, many students, especially the ones who cannot manage their time efficiently, decide to find easier ways of getting good grades. Anxiety caused by the desire to live up to these ideals often makes students cheat” (ProctorEdu, 2022). Others cite peer pressure, pressure from standardized testing, and pressure from adults as the reasons for cheating (Goldman, 2016). None of which would sway Kant.

Contributing factors to rampant cheating include readily available tools that facilitate it. They have reached epic proportions thanks to the birth of the internet in the 1990s, and the rapid march towards everything digital. Technology has been both an academic blessing and a curse. Opportunities to access information have exploded, as have the methods to cheat. According to a national survey of 2,000 middle and high school students, more than a third of teens with cell phones (35 percent) say they have used a cell phone at least once to cheat during a test, and half (52 percent) say they have used the internet to cheat (Wallace, 2009). These digital natives have helped foster a lucrative new business model for those willing to put ethics on the back burner. SchoolSucks.com founder Kenneth Sahr, whose website has the dubious honor of being the Internet’s first free homework and term paper website, stated that his website received around 8,000 visits a day (Open Education Database, 2016). Sahr is unapologetic and believes his website serves as a check and balance to mediocre professors who have been giving the same assignment since the Truman administration (Anderson, 1999). SchoolSucks.com is just one of the many websites that act as an accomplice to these ethical breaches. The list is long and growing. However, not every popular website used to cheat is complicit. After reviewing more than 40 million student papers, Turnitin, a company dedicated to combating plagiarism and a hero in the fight for academic integrity, concluded that Wikipedia is the most popular source of plagiarism (O’Shaughnessy, 2011). No doubt, academe is in a fight for academic integrity.

THE RISE OF CHATGPT

In November 2022, OpenAI, a private artificial intelligence research company based in Silicon Valley, developed a virtual bot named ChatGPT (Chat Generative Pre-Trained Transformer). ChatGPT is a large language model (LLM)

that uses deep learning to generate human-like text in response to prompts from its users. “An LLM is a computer algorithm that processes natural language inputs and predicts the next word based on what it has already seen” (Mearian, 2023). As described by MathWorks, deep learning is a machine learning technique that teaches computers to do what comes naturally to humans: learn by example (MathWorks, n.d.). It is what enables a driverless car to distinguish a pedestrian from a lamppost. ChatGPT works by *predicting* the next word in a given text based on the patterns it has learned from a massive amount of data during its training process (Fedewa, 2023). Emphasis on the word “predicting” as ChatGPT does not think; it predicts. This means the secret to success lies within the prompt it is given (Baker, 2023). The better the prompt, the better the answer you will be given. ChatGPT uses the Generative Pretrained Transformer (GPT) computing architecture to analyze and generate text for each prompt given to the program, which sets it apart from most other contemporary LLMs (Baker, 2023). Its GPT computing architecture measures not only word frequency but also their relevance within a sentence (Sallam, 2023).

THE DANGER OF CHATGPT FOR EDUCATORS

While the advent of ChatGPT has generated much excitement, it also raises serious ethical concerns in education. According to a study by Cotton et al. (2023), the accessibility and anonymity provided by ChatGPT make it an attractive option for students seeking to cheat. The study reveals that students can access the model online at any time without fear of being caught or identified, as no identifying information is stored or tracked. ChatGPT uses direct text generation, which means students can input questions or prompts and receive complete responses or essays generated by the model that are difficult for humans to distinguish as genuine or generated. This is the beauty of ChatGPT for wannabe cheaters. It is a program with no identifiers, is simple to use, and is almost impossible to distinguish human from machine text (Cotton et al., 2023). Scholarly pursuit requires effort in challenging oneself to explore new interests through research. However, current applications of ChatGPT undermine this process by feeding answers to unmotivated students while robbing them of the pursuit of knowledge. If students continue to use ChatGPT and other LLMs in this way, it will erode the very purpose and value of a degree (Cotton et al., 2023). ChatGPT’s protective mechanism against students using it to cheat is its terms of service, which stipulate that users may not “represent that output from the services was human-generated when it is not” (OpenAI, 2023). This is not exactly a firewall that educators can count upon to deter cheating. It appears that Elon Musk had a point when he tweeted, “It’s a new world. Goodbye, homework,” referencing ChatGPT (Clarence-Smith, 2023). The combination of students’ propensity to cheat and ChatGPT has created dangerous ground for educators.

THE PREVALENCE OF STUDENT USAGE OF CHATGPT

Curiosity about the usage of ChatGPT led *The Stanford Daily* to ask students to take a poll on the social media app Fizz. The Fizz app requires a Stanford.edu email to join, ensuring that only Stanford students respond to the poll. The result was that 4497 respondents representing approximately 17% of Stanford students reported using ChatGPT to assist with their Fall-2022-quarter assignments and exams (Cu, 2023). However, these results do not mean everyone used it to cheat. The majority of the 17% claimed they only used AI for brainstorming and outlining. The significance of the poll was how quickly word about ChatGPT had spread, given that it was just weeks into its release at the time of the poll. Who knows what the numbers would reveal if the same poll were taken today? Likewise, *The Harvard Crimson* decided to anonymously interview students who used ChatGPT in their coursework. To demonstrate the capabilities of ChatGPT, one student used the LLM to answer questions on their online exam during the interview. It should be noted that although the exam was open note, Harvard’s acting Dean of Undergraduate Education stipulated that “Harvard’s Honor Code forbids students to represent work as their own that they did not write, code, or create” (Duffy & Weil, 2023). The Honor Code will likely be lost on those prone to cheating.

THE RAPID EVOLUTION OF CHATGPT

To add to the problem for educators, ChatGPT grows smarter by the day. As proof, in February 2023, it was reported that ChatGPT had “come close” to passing the multiple-choice portion of the bar exam (Katz, 2023). The bar exam is a standardized exam created and administered by the National Conference of Bar Examiners (NCBE) and designed to test the skills and knowledge every lawyer needs to become licensed to practice law in their state (Kaplan, n.d.). This requires the grueling experience of three years of law school and extreme bar exam preparation for weeks or even months. To the chagrin of lawyers everywhere, ChatGPT not only passed the Uniform Bar Examination but also improved its performance in a single month, scoring in the 90th percentile in March of 2023 (Weiss, 2023). This speed-of-light learning capability may be the reason why Elon Musk has changed his tune from jovially tweeting “no more homework” to joining in with other tech giants to write an open letter demanding “an urgent pause on the training of

AI systems that are more powerful than GPT-4” (Scribner, 2023). However, ChatGPT continues to evolve from GPT-3.5 to GPT-4.0 and now GPT-5.0. The progression brought continuous improvements. ChatGPT 4.0 is multimodal, meaning it can parse both images and text, whereas GPT 3.5 could only process text. In other words, if someone shows GPT 4.0 an image of the inside of a refrigerator, it can tell the person what can be cooked for dinner that night (Griffith, 2023). ChatGPT-4.5 brought forth emotional intelligence and an improvement in the quality of the writing, together with reduced hallucinations (Horsey, 2025). Currently, GPT 5.0 has even more sophisticated reasoning capabilities and image comprehension, and can process larger documents (Zollino, n.d.). It appears that no one is heeding Elon Musk’s advice. In terms of education, the rapidly evolving capabilities of LLMs will enable even the most complex of student assignments to be completed by artificial intelligence.

AI HALLUCINATIONS

There is no doubt that ChatGPT poses great challenges for educators and institutions in their quest for academic integrity; however, the ship has sailed, and there is no turning back. ChatGPT and other LLMs are here to stay, and educators must emphasize that AI’s use should be limited and not relied upon to produce a finished product. They must also educate students about the negative impact of using ChatGPT to cheat. One reason that may deter students is that ChatGPT hallucinates on occasion. “Hallucination” in AI refers to the generation of outputs that may sound plausible but are either factually incorrect or unrelated to the given context (Marr & Bernard Marr and Co., 2023). The following is an example of what this might look like: User input: “When did Leonardo da Vinci paint the Mona Lisa?” AI-generated response: “Leonardo da Vinci painted the Mona Lisa in 1815.” (Incorrect: The Mona Lisa was painted between 1503 and 1506, or perhaps continuing until 1517) (Marr & Bernard Marr and Co., 2023). A real-world example occurred in 2023 when a U.S. judge-imposed sanctions on two New York lawyers who submitted a legal brief that included six fictitious case citations generated by ChatGPT (Merken, 2023). The attorneys claimed that it was unintentional, stating, “We made a good faith mistake in failing to believe that a piece of technology could be making up cases out of whole cloth.” This tale of woe should help students understand that ChatGPT is not infallible and can be a source of acute embarrassment. Additionally, according to the website Scribbr, using ChatGPT improperly can lead to gaps in knowledge, is unfair to other students who did not cheat, could potentially damage a reputation if discovered, could result in the publication of inaccurate or false information, and may lead to dangerous situations if it allows a student to avoid learning the fundamentals in some contexts (Ryan, 2023). Perhaps it would be a deterrent for students to contemplate lying on an operating table wondering if their surgeon relied on ChatGPT to get through medical school.

A COMPARISON OF PLAGIARISM DETECTION AND AI-GENERATED TEXT DETECTION

Since students will likely continue to use ChatGPT and other AI resources, educators would be wise to develop methods to combat AI-generated cheating. While this is a tall order, the first step is to understand the difference between plagiarism detection and AI-generated text detection. Plagiarism detection software often works by scanning the submitted document against a database of other works, both online and in its dataset (Meo & Talha, 2019). It does not determine if AI generated the text; it only determines whether the scanned text already exists in its database. This type of software works well at detecting text that matches the source precisely, but it struggles to identify unauthorized content that has been edited or refined, or when “cheaters” use substitute words, rearrange phrases, or convert text to another language (Briggs, 2025). AI-detection software is more effective at detecting plagiarism, including AI-generated text, regardless of how thoroughly students rewrite or rephrase their content (Briggs, 2025). The caveat to AI-detection software is that its accuracy cannot be guaranteed. For example, an app called GPTZero has been created by a Princeton student who claims it can detect AI-generated text (Bowman, 2023). It was so popular that when he launched it, the app crashed from overuse (Bowman, 2023). Unfortunately, a study by Futurism.com revealed that GPTZero could have a 20% error rate (Tangermann, 2023). This is sobering news, considering the negative repercussions that can follow an accusation of cheating. Nonetheless, AI-detection software seems to be the better choice for plagiarism detection, provided caution is exercised before allegations are made against a student.

WATERMARKING AS A STRATEGY FOR AI-GENERATED TEXT DETECTION

Some believe that a better method of LLM detection is to add custom watermarks to AI-generated text which would make the text visibly noticeable to educators (Tang, 2024). This would, of course, require LLM companies to comply. It is important to note that this is not a perfect solution either, as shown by the work of Sadasivan et al. (2023), who found that if savvy students intentionally added *their own watermarks*, false positives could result, undermining trust in the detection software. Due to a dearth of research in this field, it is currently impossible to know how often

malicious students would attempt to attack the integrity of watermarks by using their own to create false positive results. Based on the research in this paper, it does not bode well. Since contemporary research on the accuracy of AI text detection remains contradictory, the best weapon against AI may be educators themselves. For instance, some have successfully detected cheating using Chrome's Revision History Tool. This tool reveals "how many edits students made to their essays, how long students spent writing, and what portions of the work were copied and pasted" (Harris v. Adams, 2024).

EDUCATIONAL APPLICATIONS AND BENEFITS OF CHATGPT

ChatGPT and other LLMs have certainly complicated higher education, but it does not mean that it should lead to an outright ban, which students would likely ignore. There are some positive outcomes with ChatGPT, such as the potential to aid students with disabilities. According to an article in Accessible:

For people with speech impairments, ChatGPT can generate text responses that are easy to share in conversations. Individuals with hearing impairments can also benefit by using ChatGPT to transcribe or summarize spoken content, making it easier to stay engaged in meetings or social settings. Moreover, the AI's ability to understand context and provide nuanced responses ensures that users feel understood and supported. For non-native speakers or those with cognitive disabilities, ChatGPT can simplify complex language, breaking down information into more digestible formats. This fosters greater inclusivity and accessibility in both personal and professional settings (Accessibility, 2024).

Research conducted by Baidoo-Anu and Ansah (2023) further explored the potential benefits of ChatGPT, emphasizing personalization. They found that ChatGPT can provide personalized feedback, aid instructors in grading written assignments, translate languages, paraphrase, and offer one-on-one tutoring to students. The benefits of ChatGPT and other LLMs in education require university officials to carefully weigh the possible benefits with the potential drawbacks. Cautious integration rather than complete rejection of LLM applications may be the best course of action (Sok & Heng, 2023). Dr. Mollick, a professor at the prestigious University of Pennsylvania's Wharton not only allows his students to use ChatGPT, but requires that they do so, and he has formally adopted an AI policy into his syllabus for the first time. Dr. Mollick reminds his critics that educators were hesitant to "adopt the use of calculators too" (Kigotho, 2024). This is food for thought as we move into the future.

The utilization of ChatGPT by students to cheat has raised serious concerns about ethics and fairness in education. Educators must strive to understand students' motivations, methods, and desires to cheat, and to find effective preventive measures. At the very least, it is the moral responsibility of educators to create updated ethical guidelines that take generative AI and LLMs into account and to make it clear to students that using ChatGPT or any other applications in ways that violate academic integrity policies is unacceptable. If a line in the sand is drawn and educators hold firm to it, the positive applications of ChatGPT and other LLMs can be embraced with caution. To do otherwise will rob students of the privilege of the pursuit of knowledge and will erode the very purpose and value of a degree.

THE ETHICAL AND PROFESSIONAL FALLOUT FROM ACADEMIC MISCONDUCT

What are the repercussions of cheating in terms of the increasingly sophisticated methods that are being utilized? Though it may seem harmless, cheating has lasting effects. Repeated occurrences of copying "just one worksheet" or finding out "what's on a test" add up. Students end up not knowing the material and must continue the cycle of cheating to keep up. Additionally, students may lack the skills they need because cheating can create gaps in learning (CLRN, 2025). "Tolerating dishonest behaviors in college seems to support dishonest students who may continue to be dishonest in the future. Thus, maintaining academic integrity in college may increasingly contribute to the credibility of the workplace" (Mulisa & Ebissa, 2021). "The fear is that these lax attitudes if left unchecked, could manifest later as turning a blind eye to unethical business behavior or participating in a cover-up" (Brodowsky, 2019). One need only remember the bankruptcy of Enron and WorldCom and the 2008 financial crisis to recognize the significance of ethical decision-making in the workplace. Employers should take heed and join forces with universities to insist upon academic integrity. Furthermore, former cheating students may be prone to taking shortcuts with required company safety protocols or when driving the company vehicle when they become employees. This means employers should get their checkbooks out now, as a basic tenet in tort law is "*Respondeat Superior*" or "Let the Master Respond." In other words, employers are liable for the negligence of their employees during the course and scope of their employment, *i.e.*, while on the clock (Buckner, 2024). The accidents or missteps that occur when employees ignore the rules can be expensive. Hiring employees with integrity is imperative. Consider the unsettling notion of students who cheated their way through school dispensing medical advice and prescriptions, building bridges and skyscrapers, and representing clients in courtrooms across the country. Cheating one's way through school should not be an option.

SHARED RESPONSIBILITY FOR ACADEMIC INTEGRITY

It would be unfair to place all the blame at the feet of students. Numerous scandals at academic institutions reveal the poor example that some teachers and administrators have set. For example:

- The shameful scheme for over 15 years in which aspiring teachers in Arkansas, Mississippi, and Tennessee paid an individual to take their certification exams (Sainz, 2012).
- The nearly three dozen educators in Atlanta's public school system, including high school administrators, teachers, and even the school secretary, who were indicted for altering test scores to receive federal funding (*Fox News*, 2013).
- The removal of five teachers from the Queens, New York, Maspeth High School for testing improprieties, including giving students answers during Regents exams (Edelman, 2021).

The list could unfortunately continue. It is not only our students who use the pressure to succeed as an excuse to compromise their ethics.

Is cheating taken more seriously at the university level? Evidence indicates that while college professors lament cheating, it is nonetheless rampant. The reason may be that many in academia are loath to take it on when discovered. One study revealed that 40.3% of faculty members admitted to ignoring student cheating on one or more occasions (Coren, 2011). This may be because at most universities the academic dishonesty reporting process is often time-consuming and emotionally draining, leaving overburdened professors with little incentive to take it on. Faculty are judged by their publications, service, and teaching evaluations (Callahan, 2011). The number of cheaters they apprehend is not a factor in their success.

Furthermore, a review of the ranking criteria for universities used by *U.S. News and World Report* reveals that academic integrity was not among them (Morse & Brooks, 2023). This speaks volumes. It naturally follows that top university administrators, who understandably focus on items that will increase their ranking, will give less attention to academic integrity. In addition, the concern for potential litigation that can ensue from students accused of cheating can have a chilling effect on the desire to make such an accusation (Callahan, 2011).

Although justifications can be made for the lackluster enforcement of academic dishonesty, none are admirable. Professor Ann Buchholtz, a Rutgers Business School professor of leadership and ethics, offers some words of wisdom. She commented on a 2012 book by Professor Don McCabe, in which he described college years as critical for ethical development. Professor Buchholtz stated, "I love that point because we're working with students who are developing who they are, and what we do here will impact who they become" (Todd, 2014). This should serve as a reminder to fortify those fighting for academic integrity. Society and the business community depend upon educators to produce ethical citizens and workers. It is imperative that we not let them down.

BEST PRACTICES FOR EDUCATORS

As the harsh reality of academic integrity challenges associated with artificial intelligence becomes increasingly apparent, educators must respond with clear and proactive best practices. Academic integrity policies should be revised to incorporate transparent AI policies that are communicated to students and enforced consistently. Given the rapid evolution of AI technologies, such policies require regular review and updating. Course syllabi should explicitly delineate acceptable and unacceptable uses of AI in assignments and assessments. Assessments should be designed to emphasize higher-order thinking, prioritize reasoning, and incorporate in-class or iterative components. The use of formative assessments throughout the semester can support monitoring of student learning and development. Assessments that are particularly vulnerable to automation should be minimized. Finally, curricula should emphasize ethical reasoning and ensure that assessment practices support, rather than undermine, the development of essential skills aligned with learning objectives. The irony is that as we move rapidly into the future, we might have to embrace the teaching practices of the past to bypass current technology.

CONCLUSION

The AI train has left the station, and educators must jump aboard or become obsolete. However, they cannot be passive passengers. Controls must be implemented to allow them to choose the train's destination. The evidence is clear that cheating is ubiquitous and has a detrimental effect on the educational system. Artificial intelligence is becoming the preferred tool for cheating, and it is increasingly difficult to detect, but every effort must be made to do so. Educators

have a moral duty to all stakeholders to foster ethical behavior in their students to ensure that valid learning is occurring. This is their clarion call, and it must not be ignored. Every educator must create a culture that accepts nothing less than absolute academic integrity.

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Why the Present Value of a Plain Vanilla Semi-annual Coupon Bond Is Not Always Greater Than That of the Same Bond with Annual Coupon?

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ABSTRACT

Contrary to the conventional thinking, the present value of a bond under semi-annual compounding is not always greater than that of the same bond with annual compounding. Currently, no explanation of this observation can be found in popular corporate finance textbooks. In this study, the algebraic term, $1 - \frac{\text{Coupon Interest Rate}}{\text{Yield to Maturity}}$, is identified as the determinant factor of providing an explanation of this observation. The presented pedagogy in this paper provides the necessary complement to the pertinent coverage in textbooks. Including the seat time of the Excel spreadsheet demonstration, it takes about 20 minutes to complete all germane discussions in class. Furthermore, the pedagogical approach described herein can be readily either adapted or adopted by instructors teaching the Business Finance course.

Keywords: present value of an annuity; present value of a future lump-sum; $1 - \frac{\text{Coupon Interest Rate}}{\text{Yield to Maturity}}$; bond valuation; semi-annual compounding; Excel spreadsheet; mathematical derivation

INTRODUCTION

The present value of a plain vanilla semi-annual coupon bond is not always greater than that of the equivalent annual coupon bond. Interestingly, an explanation regarding this observation is not provided in corporate finance textbooks. A widely adopted textbook, Ross, Westerfield, and Jordan (2025), has not discussed this issue. Meanwhile, it is stated in another popular corporate finance textbook, by Brigham and Daves (2022, P. 169), that “The value with semi-annual interest payments is slightly larger, compared to the value with annually paid interest. This higher value occurs because interest payments are received somewhat sooner under semi-annual compounding.” To the contrary, Parrino, Gillan, Bates, and Kidwell (2025) illustrated that the present value of a semi-annual coupon bond is slightly less than that of the same bond with annual compounding. In addition, in an endnote of Parrino et al. (2025, P. 146), the authors stated that “If the bond sold at a premium, the reverse would be true, that is, the price with semi-annual compounding would be slightly more than the price with annual compounding.” Similarly, no explanation of these stated conclusions can be obtained from Parrino et al. (2025).

This study is built upon a portion of the author’s lecture notes of bond valuation in the Business Finance course, a compulsory finance course in most business schools’ undergraduate core curricula. The pedagogical objectives of this paper are twofold: (1) The author demonstrates how to bring this issue to students’ attention during the seat time with an Excel spreadsheet adopted. (2) A mathematical derivation is provided as the answer to the question raised in the title of this paper.

A BRIEF REVIEW OF BOND

A bond is a loan; when an investor buys a bond, the investor becomes a lender, i.e., a bondholder. Meanwhile, a bond is a long-term contract under which a borrower agrees to make payments of interest and principal, on specific dates, to the holders of the bond. A plain vanilla bond refers to the most basic and standard type of bond, and the bond issuer promises to pay back the borrowed amount, i.e., the principal or face value, at maturity, along with regular interest payments prior to the maturity called coupon payments. In this paper, we limit our discussion to plain vanilla bonds, which most likely are the type of bond discussed in this course among business schools nationwide.

The value of a plain vanilla bond is the present value of the coupon payments, i.e., the annuity, plus the present value of the repayment of the bond’s par value at maturity, i.e., the present value of the future lump-sum. The discount rate used in computing a plain vanilla bond’s present value is its yield to maturity (YTM). Instead of determining the value of a bond in dollar terms, investors often price bonds in terms of yields. The yield to maturity of a bond is the

most widely used yield measure. A bond's YTM is the required yield or the discount rate that makes the present value of the cash flows, the bond's coupon payments and the maturity value, equal to the bond price today. It is noteworthy that bondholders should recognize that earning a given YTM requires reinvestment of all coupons at the stated yield to maturity.

Annual Coupon Bonds vs. Semi-annual Coupon Bonds

It is a common practice that although some bonds pay coupon interest annually, the vast majority of bonds in the U.S. actually pay coupon interest semiannually – that is, twice a year. However, perhaps due to the pursuit of simplicity, most textbooks cover the topic of bond valuation by initially assuming that bonds pay coupon interest annually – that is, once a year. Therefore, to value semi-annual payment bonds, the valuation model of annual coupon paying bonds must be modified accordingly. Be that as it may, as mentioned previously, none of the textbooks has provided an answer to the question contained in the title of this paper.

THE EXCEL DEMONSTRATION OF THE ISSUE

There is a general consensus among educators that Excel is an extremely important and useful tool for teaching and learning in the Business Finance course, e.g., Peng (2015) and the references cited therein. During the seat time, an Excel spreadsheet is used to demonstrate that the present value of a plain vanilla semi-annual coupon bond is not always greater than that of the same bond of annual coupon.

The Example Demonstrated Through Excel in Class

The following example is used: *Suppose ABC Co. were to issue a bond with 15 years to maturity with an annual coupon rate of 10% and a par value of \$1,000. Assume that the bonds have a yield to maturity of either 9% or 11%. What will be the current market price of these bonds when the coupon interests are payable (1) annually, and (2) semiannually?*

During the seat time, each student in the author's class has access to a computing device, e.g., a notebook computer or a tablet. If needed, a student can check out a notebook computer from the university before attending class. Starting from the second week of a 15-week semester, students receive a partially completed Excel file in Moodle each week. Moodle is the learning management system (LMS) of the university where the author instructs. Each student downloads the file in class, opens it in Excel, and works on it simultaneously when the instructor is expounding from the podium how to solve the problems. Bond valuation is usually a topic covered in the middle of a semester; hence, students have been accustomed to using Excel as a tool in financial analyses by the time when this example is demonstrated in class.

Figure 1 contains information of a partially completed Excel file of this example. Two different computational methods were used in completing this Excel file, which required approximately five minutes of the seat time. The completed file is displayed in Figure 2. The first computational method was applying two separate and simpler time-value-of-money formulas by choosing cells which contained the pertinent numerical inputs. These formulas are (1) the formula of the present value of the annuity of the coupon payments, and (2) the formula of the present value of the future lump-sum of the face value. Valuations of these two simpler time-value-of-money applications have been covered prior to the discussion of bond valuation. These two formulas are listed in this paper as Equation 1 and Equation 2, respectively. As reviewed previously, a bond valuation is the sum of the present value of the annuity of the coupon payments and the present value of the face value of the bond (generally with a par value of \$1,000) when the bond matures. Combining Equations 1 and 2, Equation 3 is the mathematical formula of the bond valuation. Each variable contained in these equations is defined in Exhibit 1. In addition, these three formulas are used in the mathematical derivation contained in Appendix 1. The second computational method was to use a built-in Excel financial function, the $PV(rate, nper, pmt, [fv], [type])$ function, to figure out the bond value. It is noteworthy that an Excel formula comprises a sequence of values, cell references, names, functions, or operators in a cell that together produce a new value. An Excel formula always begins with an equal sign (=).

Figure 1: Finding the Value of ABC's Bonds: The Partially Completed Excel File

	A	B	C	D	E	F	G	H
1	When the Coupon Rate is Greater Than the YTM							
2	INPUTS: Coupons Paid Annually					INPUTS: Coupons Paid Semiannually		
3	Annual Coupon Payment	\$100	per year			The amount of half-year coupon	\$50	every six months
4	Effective Maturity	15	years			Effective Maturity (<i>N</i>)	30	six months
5	YTM	9%	per year			Half-year interest rate (1/2 of the YTM)	4.50%	every six months
6	FV ₁₅	\$1,000				FV ₃₀	\$1,000	
7								
8	OUTPUTS:					OUTPUTS:		
9	What is the current price of the bond?					What is the current price of the bond?		
10			#N/A					#N/A
11	Alternatively,					Alternatively,		
12			#N/A					#N/A
13								
14	When the Coupon Rate is Less Than the YTM							
15	INPUTS: Coupons Paid Annually					INPUTS: Coupons Paid Semiannually		
16	Annual Coupon Payment	\$100	per year			The amount of half-year coupon	\$50	every six months
17	Effective Maturity (<i>N</i>)	15	years			Effective Maturity (<i>N</i>)	30	six months
18	YTM	11%	per year			Half-year interest rate (1/2 of the YTM)	5.50%	every six months
19	FV ₁₅	\$1,000				FV ₃₀	\$1,000	
20								
21	OUTPUTS:					OUTPUTS:		
22	What is the current price of the bond?					What is the current price of the bond?		
23			#N/A					#N/A
24	Alternatively,					Alternatively,		
25			#N/A					#N/A
26								

Equation 1: The Present Value of the Bond's Coupon Payments (Annuity Payments)

$$\text{The Present Value of the Coupons} = \sum_{n=1}^T \frac{PMT}{(1 + YTM)^n} = PMT \times \frac{1 - (1 + YTM)^{-T}}{YTM}$$

Equation 2: The Present Value of the Bond's Redemption Value (Face Value)

$$\text{The Present Value of the Face Value} = \frac{\text{The Face Value}}{(1 + YTM)^T} = \frac{\$1,000}{(1 + YTM)^T}$$

Equation 3: The Present Value of the Bond

$$\begin{aligned} \text{The Present Value of the Bond} &= \sum_{n=1}^T \frac{PMT}{(1 + YTM)^n} + \frac{\text{The Face Value}}{(1 + YTM)^T} \\ &= PMT \times \frac{1 - (1 + YTM)^{-T}}{YTM} + \frac{\$1,000}{(1 + YTM)^T} \end{aligned}$$

The results of the demonstration are contained in Figure 2. Initially, students expressed the thought that the value of semi-annual coupon bonds would *always* be larger compared with annual coupon bonds, because coupon payments are received sooner with semi-annual compounding. Using this example, the author has demonstrated in class that when the coupon rate is less than its YTM, i.e., when it is a discount bond, the value of the semi-annual coupon bond is actually lower.

Figure 2: Finding the Value of ABC's Bonds: The Completed Excel File

	A	B	C	D	E	F	G	H	I	J
1	<u>When the Coupon Rate is Greater Than the YTM</u>									
2	INPUTS: Coupons Paid Annually			INPUTS: Coupons Paid Semiannually						
3	Annual Coupon Payment	\$100	per year	The amount of half-year coupon			\$50	every six months		
4	Effective Maturity	15	years	Effective Maturity			30	six months		
5	YTM	9%	per year	Half-year interest rate (1/2 of the YTM)			4.50%	every six months		
6	FV ₁₅	\$1,000		FV ₃₀			\$1,000			
7										
8	OUTPUTS:			OUTPUTS:						
9	What is the current price of the bond?			What is the current price of the bond?						
10	\$1,080.61	=B3*(1-(1+B5)^-B4)/B5+B6/(1+B5)^B4			\$1,081.44 =G3*(1-(1+G5)^-G4)/G5+G6/(1+G5)^G4					
11	Alternatively,			Alternatively,						
12	\$1,080.61	=PV(B5,B4,-B3,-B6)			\$1,081.44 =PV(G5,G4,-G3,-G6)					
13										
14	<u>When the Coupon Rate is Less Than the YTM</u>									
15	INPUTS: Coupons Paid Annually			INPUTS: Coupons Paid Semiannually						
16	Annual Coupon Payment	\$100	per year	The amount of half-year coupon			\$50	every six months		
17	Effective Maturity	15	years	Effective Maturity			30	six months		
18	YTM	11%	per year	Half-year interest rate (1/2 of the YTM)			5.50%	every six months		
19	FV ₁₅	\$1,000		FV ₃₀			\$1,000			
20										
21	OUTPUTS:			OUTPUTS:						
22	What is the current price of the bond?			What is the current price of the bond?						
23	\$928.09	=B16*(1-(1+B18)^-B17)/B18+B19/(1+B18)^B17			\$927.33 =G16*(1-(1+G18)^-G17)/G18+G19/(1+G18)^G17					
24	Alternatively,			Alternatively,						
25	\$928.09	=PV(B18,B17,-B16,-B19)			\$927.33 =PV(G18,G17,-G16,-G19)					
26										

THE PRESENT VALUE OF A DISCOUNT BOND WITH SEMI-ANNUAL COMPOUNDING IS LESS THAN THAT OF THE SAME BOND WITH ANNUAL COMPOUNDING: THE MATHEMATICAL DERIVATION

During the process of completing the example by the author, several students asked the following question in class: Why is the value of a discount bond with semi-annual coupons *lower*? Most students find this observation interesting as well as confusing. Currently, no explanation of this observation can be found in popular corporate finance textbooks. After provoking students' interest in this issue, with the time value of money concepts as the backdrop, a mathematical derivation is given subsequently in class as an explanation of this observation.

It took about 15 minutes in class to complete the mathematical derivation along with pertinent discussions. During the seat time, the instructor's iPad and MacBook are both connected wirelessly to the same Wi-Fi network of the university, and the MacBook is connected to the podium computer system via an HDMI cable. Using a digital note-taking app called GoodNotes and an Apple Pencil, the derivation was done with the author's iPad. This handwritten derivation discussed in class is available in Appendix 1. As a teaching routine, the author's handwritten lecture notes of each class session are uploaded to Moodle as PDF files so that students can review them at any time during the semester.

Exhibit 1: Key Variables of Computing the Bond Value Used in the Derivation

Par Value: Stated face value of the bond; it is assumed to be \$1,000.

Coupon Interest Rate: The amount of the annual coupon divided by the face value of the bond; it is denoted as *CR*.

Coupon Payment: Dollars of interest paid each year; it is denoted as *PMT*. For the semi-annual coupon bond, it is denoted as *PMT/2* (quoted on a per every six months basis).

Time to Maturity: The remaining length of time of the bond to its stated maturity date on which the principal amount is paid; it is denoted as *T* (quoted in the number of years). For the semi-annual coupon bond, it is denoted as *2T* (quoted in the number of six months).

Yield to Maturity: The bond's market rate of interest (quoted on a per year basis); it is denoted as *YTM*. For the semi-annual coupon bond, it is denoted as *YTM/2* (quoted on a per every six months basis).

Highlights of the Derivation

Regarding students' aforementioned question, why the value of a discount bond with semi-annual coupons is lower, there is not an answer available from textbooks. Although an example is used in Parrino et al. (2025) to illustrate that the value of a semi-annual coupon bond is lower, it does not provide any reason why the conclusion only applies to discount bonds. An inquisitive student would most likely want to know the reason behind this stated conclusion, in particular due to the conventional thinking that the value of semi-annual coupon bonds will always be larger because coupon payments are received sooner with semi-annual compounding.

The purpose of giving students the derivation in class is to provide them a clear understanding why the value of a discount bond with semi-annual coupons is lower. As stated earlier in the paper, the derivation is done through the author's iPad so that students can pay closer attention to the instructor's lecturing without having to copy down the lecture notes. The key findings of the derivation are as follows: (1) The present value of the face value of a semi-annual coupon bond is *always* less than that of the same bond with annual coupon. (2) The present value of an annuity with semi-annual compounding is *always* greater than the present value of the same annuity with annual compounding. (3) As reviewed previously and shown in Equation (3), the value of a bond is the sum of the present value of its coupon payments, i.e., the annuity, and the present value of the repayment of its face value at maturity. Therefore, there is not a conclusive answer of whether the present value of a semi-annual compounding bond is either greater than or less than that of the same bond with annual compounding. (4) A greater present value of any bond depends upon the sign of the algebraic term, $1 - \frac{\text{Coupon Interest Rate}}{\text{Yield to Maturity}}$. Specifically, if $1 - \frac{CR}{YTM} < 0 \Rightarrow \frac{CR}{YTM} > 1 \Rightarrow CR > YTM$, i.e., if it is a premium bond, the present value of the semi-annual coupon bond will be greater. If $1 - \frac{CR}{YTM} > 0 \Rightarrow \frac{CR}{YTM} < 1 \Rightarrow CR < YTM$, i.e., if it is a discount bond, the present value of the annual coupon bond will be greater. If $1 - \frac{CR}{YTM} = 0 \Rightarrow CR = YTM$, i.e., if it is a par bond, the present value of both bonds will be the same as \$1,000.

CONCLUSIONS

Generally speaking, it is the author's observation that students would like to know how each valuation formula is obtained, in particular when applications done through Excel spreadsheets are involved in the learning process. In this paper, diametrically opposite to the conventional thinking, the mathematical derivation confirms that the present value of a bond under semi-annual compounding is not always greater than that of the same bond with annual compounding. The determinant of which bond would have a larger present value is the sign of the algebraic term, $1 - \frac{\text{Coupon Interest Rate}}{\text{Yield to Maturity}}$. It takes about 20 minutes of the seat time to complete all relevant discussions of this topic. The presented pedagogy provides an essential complement to the pertinent coverage contained in corporate finance textbooks. Meanwhile, the pedagogical approach described herein can be readily either adapted or adopted by instructors teaching the Business Finance course.

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Why the present value of a semi-annual Bond Is NOT always Greater Than the Present Value of An Annual Coupon Bond?

$$\text{Prove } \left(1 + \frac{YTM}{2}\right)^{2T} > (1 + YTM)^T$$

$$\left(1 + \frac{YTM}{2}\right)^{2T} = \left(1 + YTM + \frac{YTM^2}{4}\right)^T$$

Given $T > 0$, and Assume $YTM \neq 0$.

$$\Rightarrow 1 + YTM + \frac{YTM^2}{4} > 1 + YTM$$

Alternatively, it is obvious, $\frac{YTM^2}{4} > 0$.

$$\text{Thus, } \left(1 + \frac{YTM}{2}\right)^{2T} > (1 + YTM)^T$$

Also, note that a bond valuation is a combination of two types of time-of-value money applications. That is,

$$\Rightarrow \text{PV of a bond} = \text{PV of an annuity} + \text{PV of the Face Value of the bond}$$

Therefore, we can reach the following two conclusions:

(1) The PV of \$1,000 face-value, semi-annual bond is ALWAYS less than the PV of \$1,000 face-value annual bond.

Due to the following inequality:

$$\frac{\$1,000}{\left(1 + \frac{YTM}{2}\right)^{2T}} < \frac{\$1,000}{(1 + YTM)^T}$$

PV of the semi-annual bond's par value at maturity

PV of the annual bond's par value at maturity

(2) The PV of an annuity with semi-annual compounding is always greater than the PV of an annuity with annual compounding.

The PV of semi-annual coupon payments is as follows:

$$\frac{PMT}{2} \cdot \frac{1 - (1 + \frac{YTM}{2})^{-2T}}{\frac{YTM}{2}} = \frac{PMT}{YTM} \cdot [1 - (1 + \frac{YTM}{2})^{-2T}]$$

The PV of annual coupon payments is as follows:

$$PMT \cdot \frac{1 - (1 + YTM)^{-T}}{YTM} = \frac{PMT}{YTM} \cdot [1 - (1 + YTM)^{-T}]$$

$$\text{Given } (1 + \frac{YTM}{2})^{2T} > (1 + YTM)^T,$$

$$\Rightarrow (1 + \frac{YTM}{2})^{-2T} < (1 + YTM)^{-T}$$

$$\Rightarrow 1 - (1 + \frac{YTM}{2})^{-2T} > 1 - (1 + YTM)^{-T}$$

Therefore,

$$\Rightarrow \frac{PMT}{YTM} \cdot [1 - (1 + \frac{YTM}{2})^{-2T}] > \frac{PMT}{YTM} \cdot [1 - (1 + YTM)^{-T}] \leftarrow$$

PV of the semi-annual compounding annuity payments

PV of the annual compounding annuity payments

Conclusion #3: Given the derivations of Conclusions #1 and #2, there is not a conclusive answer of which bond will have a greater or smaller present value.

The PV of semi-annual compounding bond is given as follows:

$$PV_{\text{semi}} = \frac{PMT}{YTM} \cdot \left[1 - \left(1 + \frac{YTM}{2} \right)^{-2T} \right] + \$1,000 \times \left(1 + \frac{YTM}{2} \right)^{-2T} \quad (A)$$

The PV of annual compounding bond is given as follows:

$$PV_{\text{annual}} = \frac{PMT}{YTM} \cdot \left[1 - (1 + YTM)^{-T} \right] + \$1,000 \times (1 + YTM)^{-T} \quad (B)$$

$$\text{Let } S = (B) - (A)$$

$$\Rightarrow S = \frac{PMT}{YTM} \cdot \left[1 - (1 + YTM)^{-T} \right] + \$1,000 \times (1 + YTM)^{-T} - \frac{PMT}{YTM} \cdot \left[1 - \left(1 + \frac{YTM}{2} \right)^{-2T} \right] - \$1,000 \times \left(1 + \frac{YTM}{2} \right)^{-2T}$$

$$\Rightarrow S = \frac{\$1,000 \times CR}{YTM} \cdot \left[1 - (1 + YTM)^{-T} \right] + \$1,000 \times (1 + YTM)^{-T} - \frac{\$1,000 \times CR}{YTM} \cdot \left[1 - \left(1 + \frac{YTM}{2} \right)^{-2T} \right] - \$1,000 \times \left(1 + \frac{YTM}{2} \right)^{-2T}$$

with the understanding $PMT = \$1,000 \times CR$.

$$\text{Set } G = \frac{S}{\$1,000}$$

$$\begin{aligned}
\Rightarrow G &= \frac{CR}{YTM} \cdot [1 - (1 + YTM)^{-T}] + (1 + YTM)^{-T} \\
&\quad - \frac{CR}{YTM} \cdot [1 - (1 + \frac{YTM}{2})^{-2T}] - (1 + \frac{YTM}{2})^{-2T} \\
\Rightarrow G &= \frac{CR}{YTM} - \frac{CR}{YTM} \cdot (1 + YTM)^{-T} - \frac{CR}{YTM} + \frac{CR}{YTM} \cdot (1 + \frac{YTM}{2})^{-2T} \\
&\quad + (1 + YTM)^{-T} - (1 + \frac{YTM}{2})^{-2T} \\
\Rightarrow G &= (1 + YTM)^{-T} \cdot (1 - \frac{CR}{YTM}) - (1 + \frac{YTM}{2})^{-2T} \cdot (1 - \frac{CR}{YTM}) \\
\Rightarrow G &= (1 - \frac{CR}{YTM}) \cdot [(1 + YTM)^{-T} - (1 + \frac{YTM}{2})^{-2T}] \quad (C)
\end{aligned}$$

Given that, $(1 + \frac{YTM}{2})^{-2T} < (1 + YTM)^{-T}$

$$\Rightarrow (1 + YTM)^{-T} - (1 + \frac{YTM}{2})^{-2T} > 0$$

Therefore, whether G or S is greater or less than zero depends on the sign of the first term contained on the right-hand side of Equation (c), which is $1 - \frac{CR}{YTM}$.

Conclusion #4:

If $1 - \frac{CR}{YTM} < 0, \Rightarrow \frac{CR}{YTM} > 1, \Rightarrow CR > YTM,$

then, the PV of the semi-annual bond is greater.

If $1 - \frac{CR}{YTM} > 0, \Rightarrow \frac{CR}{YTM} < 1, \Rightarrow CR < YTM,$

then, the PV of the annual compounding bond is greater.

If $1 - \frac{CR}{YTM} = 0, \Rightarrow CR = YTM.$

then, the PV of both bonds will be the same,
i.e., \$1,000.

Note: You can verify this scenario by changing the coupon rate to be 10%, which is the YTM estimate of the example that we went through in Excel earlier.

Q.E.D.

Where You Are From Affects How You Learn and Why You Learn That Way: A Comparison of Student Groups in the US and India

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ABSTRACT

This cross-national study investigates how national culture shapes students' preferred communication modes throughout various team phases in the United States and India. We use a modified questionnaire developed in previous research exploring students' experiences and preferences regarding communication in group projects. Guided by Hofstede's cultural framework, we test cross-country differences in preferences for face-to-face (FTF), virtual (e.g., videoconferencing), and social media channels. Across both countries, FTF is preferred to virtual, and virtual to social media. Indian students nevertheless exhibit greater acceptance of digital channels throughout team phases, whereas U.S. students show a stronger preference for direct, explicit communication. We interpret these patterns through Lewis's cultural model and Hall's high-/low-context distinction. The study concludes with actionable recommendations for structuring group work and selecting media across team phases, as well as pedagogical implications for a globalized, AI-driven era.

Keywords: National culture (Hofstede) impact on communication channel preferences; US vs. India student communication preferences; Application of Lewis cultural model; Application of Hall's high-context/low-context model

INTRODUCTION

As international trade and cross-border scientific and political collaboration continue to expand, even as global geopolitical tensions rise, academics and multinational organizations increasingly need to communicate and interact effectively. Meeting this need requires not only broader foreign language education but also a deeper awareness of other peoples' customs, societies, and cultures (Hofstede et al., 2010; Lewis, 2006). In today's interconnected yet often fragmented world, sensitivity to cultural dynamics has become an essential complement to technical expertise, shaping how people cooperate and build trust across national boundaries (Delhey, Newton, & Welzel, 2011).

Our interest in this subject was initially sparked at a business conference featuring Chinese leaders, who were keen to decipher the formula behind American business success (Zeff & Higby, 2017). That encounter highlighted how cultural expectations and communication styles shape perceptions of leadership, performance, and collaboration. Since then, we have become increasingly focused on the cultural impact on student interaction and performance in groups and project teams within the classroom. Higher education is itself a small-scale version of globalization: students are often placed in culturally diverse teams where they must collaborate and problem-solve (Jaakkola, Henno, & Mäkelä, 2024). Even when such diversity is not yet present in their immediate environment, the reality of today's global workforce ensures that they will soon need to engage with colleagues from different cultural backgrounds. Examining these settings therefore offers valuable insights and practical hands-on experiences into how cultural dynamics actually operate in practice.

While our primary focus is on multicultural teams, the insights of this study may also benefit teams with more homogeneous cultural backgrounds. Even in such settings, members differ in personality, values, and communication styles; developing cultural sensitivity and intelligence equips individuals to recognize, appreciate, and work effectively with these differences.

Culture influences many everyday phenomena, but it is perhaps most visible in communication (Glinkowska-Krauze, Chebotarov, & Chebotarov, 2020). Misunderstandings often arise due to language barriers, different interpretations of concepts and structures, and hidden meanings embedded in different cultural norms. Trust is equally important regarding how it is built, maintained, and expressed in both internal and external relationships (Jaakkola, 2023). Organizational and educational contexts reflect how trust functions as a foundation for collaboration, and its absence can derail even well-structured projects (Bartosik-Purgat & Rakowska, 2023). In today's globalized environment the profound effect of national culture on communication and trust highlights the necessity of cultural intelligence. The need for such intelligence has become more urgent with the rapid digitalization of communication (Lifintsev & Wellbrock, 2019). The pre-pandemic shift from offline to online modalities—later accelerated by lockdowns

globally—fundamentally reshaped the way individuals and groups interact (Amankwah-Amoah, Khan, Wood, & Knight, 2021; LaBerge, O'Toole, Schneider, & Smaje, 2020). In online settings, where non-verbal cues are limited and cultural differences can be magnified, communication strategies rooted in cultural awareness become especially critical (Jaakkola, 2023).

To investigate these dynamics, we developed a questionnaire designed to identify differences in preferences and usage of communication methods across cultures. Previous studies have emphasized that student participation and performance are strongly influenced by communication and group processes, which are shaped by national culture (Choi & Zeff, 2020; Poort, Jansen, & Hofman, 2022). Building on this line of work, our research compares two contexts of growing geopolitical and economic relevance: the U.S. and India. Many experts anticipate further strengthening of U.S.–India ties due to shared strategic interests across defense, technology, and trade (MacRae, 2025). Understanding how cultural dynamics may shape communication between students from these two nations can therefore shed light not only on educational outcomes but also on broader professional competencies required for effective cross-cultural collaboration in their future. Accordingly, our guiding research question is: To what extent and in what ways does national culture influence how you learn and why?

By examining the cultural dynamics in the U.S. and India and their influence on group communication among university students in each country, we provide theoretical and practical contributions. We improve the literature on cultural intelligence, communication, and education in an increasingly globalized context while equipping students with critical skills needed to thrive in the international job market. Thus, this study fosters academic achievement and personal growth and prepares students to meet the complexities of professional life.

LITERATURE REVIEW

National culture shapes how people live, think, and act, with clear implications for everyday organizational life (Hofstede et al., 2010) and communication is a primary channel through which culture operates (Bartosik-Purgat & Rakowska, 2023). In workplaces, common sources of tension include misinterpretation and language barriers, divergent conceptual frames and organizational structures, high- vs. low-context messaging (Hall, 1976; Kittler et al., 2011), and differing expectations for how trust is built and maintained—internally and externally (Jaakkola, 2023). These dynamics make cultural intelligence—the ability to interpret and adapt to diverse cultural cues (Earley and Ang, 2003)—essential in a globalized environment and it is valuable to study national cultures because it transforms the implicit notion of ‘the way people do things here’ into a construct that can be anticipated, systematically measured, and effectively managed, rather than encountered unexpectedly (Bartosik-Purgat & Rakowska, 2023).

Using factor analyses of a worldwide IBM employee survey, Hofstede developed the cultural-dimensions framework (Hofstede, 1980, 2001). The framework was subsequently broadened—drawing on the Chinese Values Survey and later syntheses—to six national-culture dimensions (Hofstede & Bond, 1988; Hofstede, 2011). Of these, individualism–collectivism is strongly associated with differences in communication style (Kapoor, Hughes, Baldwin, & Blue, 2003; Park et al., 2012). It captures the extent to which people are integrated into groups. In individualist societies, social ties are relatively loose beyond the immediate family and the “I” takes precedence, while in collectivist societies, people belong to tightly knit in-groups—often extended family and close networks—characterized by strong loyalty and mutual obligations (Hofstede, 2011). These tendencies help explain contrasts between more direct, low-context messaging and more indirect, relationship-sensitive, high-context communication, with downstream effects on feedback, disagreement, persuasion, and trust building (Park et al., 2012).

National cultures influence not only how people communicate but also how they build and maintain trust. Communication and trust are deeply intertwined, and culture shapes both through values, norms, and expectations (Outila, Mihailova, Reiche, & Piekkari, 2020). Delhey et al. (2011) show that Hofstede’s individualism–collectivism dimension strongly shapes both the level and radius of trust. In collectivist cultures, generalized trust tends to remain narrowly concentrated within family and close networks, and communication is typically high-context. With outsiders, initial trust is low, leading to guarded interactions. By contrast, individualist cultures exhibit a wider radius of trust, extending even to strangers, which supports more open, direct, and low-context communication. Thus, individualism tends to foster generalized trust and transparent exchanges, while collectivism restricts trust to in-groups and depends on shared context (van Hoorn, 2015). When generalized trust is low, people often rely on multiple communication channels and repeated interactions to verify intentions and build confidence (Choi, Zeff, & Higby, 2019; Shinnishi & Higa, 2018). This is common in collectivist or narrow-radius cultures, where trust is reserved for in-groups while outsiders must earn credibility through richer, redundant exchanges (Huff & Kelley, 2003; Tarakçı, 2018). In contrast, high-trust, individualist societies assume goodwill more broadly, allowing trust to emerge through leaner

communication methods (Huff & Kelley, 2003; Tarakçı, 2018). Hence, fragile trust grows with frequent, rich communication, while strong generalized trust reduces the need for multiple contact points (Lesmeister, Limbach, & Goergen, 2022; van Zoonen, Sivunen, & Blomqvist, 2024).

Since Hofstede's seminal dimensions (1980), numerous cross-national frameworks have emerged (e.g., Trompenaars & Hampden-Turner, 2011; House et al., 2004; Lewis, 2006). One of the widely used approaches is Lewis's cultural model, which distinguishes linear-active, multi-active, and reactive orientations that shape both communication and information practices. These orientations reflect a useful contrast between data-oriented and dialogue-oriented practices that help explain differences often observed between the U.S. (more linear-active, data-oriented) and India (more multi-active, dialogue-oriented). In dialogue-oriented cultures (e.g., India), feelings are expected to shape behavior with visible interpersonal implications, and meaning is built through conversation and broad personal networks. Information from dialogue and unofficial sources may carry more weight than impersonal "facts," while tasks are often executed in reorganized, dynamic chunks rather than in a fixed, pre-specified order (Jaakkola, 2023; Lewis, 2006). By contrast, data-oriented contexts (e.g., the U.S.) prioritize research, documentation, and sequencing, with action typically following from accumulated evidence and predefined plans (Lewis, 2006).

Furthermore, Hall's high-low context distinction helps explain why the contrast between a data-oriented U.S. and a dialogue-oriented India often appears in practice. The U.S. is a prototypical low-context culture, where meaning is conveyed through explicit, self-contained messages. Rules and knowledge are codified and widely accessible, and a single, well-chosen channel is usually sufficient (Hall, 1976; Kapoor, Hughes, Baldwin, & Blue, 2003; Kittler et al., 2011). India, by contrast, is relatively high-context. Messages are often conveyed "between the lines," grounded in long-term relationships. Knowledge tends to be situational and relational, and communication is most effective when layered across multiple, overlapping channels, such as conversations with follow-ups in different media (Hall, 1976; Kapoor et al., 2003; Kittler et al., 2011). This comparison fits well with Lewis's model: the U.S. aligns with linear-active, data-oriented practices that favor documentation and sequencing, whereas India aligns with multi-active, dialogue-oriented practices in which understanding and action emerge through interaction and broad personal networks (Lewis, 2006).

Empirical studies of U.S.–India business communication report the similar patterns (Naghavi & Mubarak, 2019; Thampi et al., 2015). Compared with the U.S., India's business communication is typically more relational, hierarchy-attentive, and time-flexible, particularly in negotiations, where trust-building is expected at the outset and messages are more indirect and context-dependent (Naghavi & Mubarak, 2019). U.S. managers usually prefer direct, explicit communication and faster, contract-centered closure, whereas Indian managers often emphasize relationships before deals and may adapt execution as circumstances change (Naghavi & Mubarak, 2019). Indian culture shows a blend of collectivist and individualist logics and typically lower uncertainty avoidance compared to the U.S. This makes ambiguity more tolerable, though clear next steps and written confirmations can help bridge expectations (Thampi et al., 2015).

METHODOLOGY

Questionnaire Development and Structure

The initial questionnaire was previously developed based on two focus group interviews with students from a private university in the Midwestern United States. All items were pre-tested to ensure they accurately reflected comments from the focus groups. This questionnaire was modified to more directly address our present research question. Loosely aligned with Bruce Tuckman and Mary Ann Jensen's (1977) five stages of group development, items were organized into three broader phases to capture team progress: (1) Initial (Forming–Storming), (2) Doing (Norming–Performing), and (3) Completion/Outcome (Adjourning). First, participants were asked about their overall communication preferences when completing a group project. Second, they were asked about the reasons behind these preferences, focusing on their experiences with essential group processes during the Initial (Forming–Storming) and Doing (Norming–Performing) stages. Finally, participants were asked about how different communication methods impacted group performance and satisfaction during the Completion/Outcome (Adjourning) stage.

Because this study involved respondents from India, the questionnaire language was carefully considered. The full instrument was written in English, and before deploying it for data collection in India, we consulted with a scholar who specializes in Indian culture and students to ensure its appropriateness. The scholar advised that English would be the most suitable language, given its role as the common language of higher education in India and the wide diversity of local languages among Indian students. The questionnaire was then pre-tested by this scholar to ensure it could be used to collect a comparable sample of university students in India.

Participants and Recruitment

Data were collected from two samples using online surveys. The first sample was recruited in India in July 2022 through SurveyMonkey Audience, an online panel service that provides access to a diverse pool of respondents. Participants were adults aged 18 years or older who were currently enrolled as college or graduate students in India. Because the SurveyMonkey platform limits the number of items per survey, the instrument was administered in three parallel forms. All forms were posted simultaneously and distributed to the full panel. Panelists could complete any form(s); completion of all three was neither required nor tracked, and responses could not be linked at the individual level across forms. Given the simultaneous launch to the same sampling frame, some overlap of respondents across forms is likely. Nevertheless, we treat the forms as independent, time-matched cross-sections drawn from the same population. This design is appropriate for our objective of comparing overall response patterns between countries (“horizontal” comparisons across groups and questions), rather than analyzing how individual people’s answers relate to each other (“vertical” comparisons within persons). Participants received standard, small panel incentives administered by SurveyMonkey Audience.

The second sample was recruited in the United States between November and December 2022. Students from a private university in the Midwestern United States were invited to participate. Eligible participants were college or graduate students aged 18 years or older. Those who completed the survey received small extra credit points as compensation.

After data cleaning, which included removing incomplete responses and those failing attention checks (e.g., ‘*Please select Strongly Disagree to show you are paying attention to this question.*’), a total of 1,148 responses from India across the three parts (341 for Part 1, 289 for Part 2, and 518 for Part 3) and 148 complete surveys from U.S. were retained for analysis. All participants provided informed consent, and no personally identifiable information was collected.

The demographic characteristics of the two student samples are presented as follows. For the Indian student sample, 67.4% of respondents were male, and 82.6% were between 18 and 25 years of age. With respect to online course exposure, 68.2% of the respondents indicated that 30% or more of their courses had been conducted entirely online. For the U.S. student sample, 62.2% of respondents were female, and 94.6% were between 18 and 25 years of age. In terms of online course exposure, 73% of the participants indicated that 30% or more of their courses had been delivered entirely online.

Table 1: Demographic Characteristics

Measure	India student (%)	U.S. student (%)
Female	32.6	62.2
Age between 18 and 25	82.6	94.6
≥ 30% of courses fully online	68.2	73

Analytic Approach

To address our research, we conducted two types of statistical analyses. First, we examined whether participants in each group significantly agreed or disagreed with each survey statement using one-sample t-tests, testing whether their mean response differed significantly from the neutral midpoint (3) on the 5-point Likert scale. The resulting t-values and significance levels (p values) are presented in the respective columns for each student sample within the tables. Second, we conducted analyses of variance (ANOVA) to compare mean responses between the U.S. and Indian student samples, assessing whether significant cross-national differences existed for each item. For the India data, we analyze each of the three survey versions as separate snapshots and simply compare group differences (US vs. India) within each question, not person-level links across questions. The p values from these ANOVAs are reported in the last column of the tables. All statistical analyses were performed using SPSS (IBM Corp., 2013).

RESULTS AND DISCUSSION

Overview

The purpose of our study is to examine the impact of national culture on group processes and performance. In a globalized world, effective cross-cultural interaction is a vital skill that enhances communication within multicultural teams and improves project outcomes (Hofstede et al., 2010; Hofstede, 2011; Trompenaars et al., 2011). National culture shapes core values that guide behavior and influences communication, problem-solving, and teamwork (Taras,

Kirkman, & Steel, 2010; Holliday, 2018). We therefore ask the following research question: To what extent and in what ways does national culture influence how you learn and why?

Our findings are presented in alignment with Tuckman and Jensen's stages of group development (1977): ①Initial (Forming-Storming), ②Doing (Norming-Performing), and ③Completion/Outcome stages (Adjourning). We first analyze the communication preferences of U.S. and Indian students in completing a group project (Table 2 – Overall preference). Next, we examine the reasons behind these preferences by assessing their experiences across essential group processes (Tables 3 – Initial and 4 – Doing stages). Finally, we evaluate how communication methods impact group performance and satisfaction (Table 5 – Completion/Outcome stage).

In all three stages, both student groups prefer face-to-face (FTF) communication the most, followed by virtual communication, while social media is least favored. Indian students, however, show greater openness to virtual and social media platforms. These differences can be further illuminated through cultural frameworks such as Lewis' cultural model (2006) and Hall's cultural dimensions approach (1976). Lewis distinguishes between dialogue-oriented and data-oriented cultures. Dialogue-oriented cultures—what Hall (1976) describes as high-context—rely on layered communication channels, including verbal and non-verbal cues and broader social context, to convey implied meanings and foster understanding (Lewis, 2006). In contrast, data-oriented (Lewis, 2006) or low-context cultures (Hall, 1976; Kittler et al., 2011) emphasize clarity and directness, often depending on a single, well-chosen communication channel to ensure effective information delivery. The variation reflects differing definitions of communication effectiveness: in low-context cultures, effectiveness is measured by task clarity, results, and explicit conclusions, whereas in high-context cultures it also encompasses interpersonal dynamics and situational awareness (Hall, 1976; Kittler et al., 2011).

In comparing the U.S. and India, these frameworks reveal contrasting orientations toward trust and communication. Delhey et al. (2011) found that India exhibits lower levels of generalized trust and a narrower radius of trust than the U.S., reflecting its more collectivist orientation. In collectivist contexts, trust is largely confined to family and close networks, which fosters guarded, relationship-centered communication (Delhey et al., 2011). Outsiders must earn credibility through repeated and layered exchanges that combine verbal, relational, and contextual cues (Huff & Kelley, 2003; Tarakçı, 2018). As a result, Indian communication practices align closely with Lewis' dialogue-oriented (2010) and Hall's high-context categorization (1976). Indirect, flexible, and highly attentive to relational considerations, this dialogue-orientation encourages Indian students to draw not only on FTF interactions but also on multiple informal sources of information to reduce uncertainty. Moreover, since Indian culture tends to avoid confrontation and favors indirect problem-solving, flexible and less direct communication channels are especially valued (Metcalf et al., 2006; Naghavi & Mubarak, 2019).

By contrast, the U.S., as a more individualist and high-trust society, displays a wider radius of trust that extends even to strangers (Hofstede, 2011; Delhey et al., 2011). This generalized trust enables communication that is more direct, transparent, and task-focused (Igarashi & Hirashima, 2021; Song, Peng, & Yu, 2020). Confidence can be established through fewer interactions, and leaner communication channels are considered sufficient (Lesmeister, Limbach, & Goergen, 2022; van Zoonen, Sivunen, & Blomqvist, 2024). In this sense, U.S. communication effectiveness is primarily defined by clarity, efficiency, and explicitness, whereas Indian effectiveness depends more on contextual cues, relationship-building, and redundancy across multiple channels (Berger, Barnes, & Konwar, 2020; Würtz, 2005). Taken together, these cultural contrasts explain why Indian communicators often prefer layered, multi-channel exchanges to build trust and understanding, while their U.S. counterparts are more comfortable relying on fewer, leaner channels to achieve clarity and efficiency.

Overall Preferences

Table 2 (see below) reflects a strong overall preference for FTF communication among all students. Both U.S. and Indian respondents favor FTF over virtual or social media for group work (Q1), and virtual communication over social media (Q2). U.S. students show lower preference for virtual communication than Indian students, and an even stronger avoidance to social media (Q3, See column “Diff.”). In fact, U.S. students consistently do not consider social media a relevant tool for class-related activities (Choi et al., 2019). This is consistent with American students being more data-oriented, while Indian students reflect a more dialogue-oriented culture.

Table 2: Overall Preference for Group Interaction Method

Element	#	Question	US (n=148)	India (n=341)	Diff.
Overall Preference	1	I prefer face-to-face meetings over virtual communication or social media communication.	3.78***	3.73***	0.640
	2	I prefer virtual communication over social media communication or face-to-face meetings.	2.54***	2.79**	0.027
	3	I prefer social media communication over virtual communication or face-to-face meetings.	2.19***	2.59***	0.000

*** $p < 0.001$, ** $p < 0.01$

Initial Stage

In the Initial stage (i.e., Forming–Storming), teams are in the process of coming together, establishing roles and goals, while simultaneously navigating early conflicts, divergent ideas, and power struggles (Bonebright, 2010; Tuckman & Jensen, 1977). In this stage (see Table 3, below), both groups view FTF communication as the most effective. U.S. students especially value direct involvement for group formation (Q4-5), trust-building (Q6-9), and managing conflicts (Q21-23). Statistically, they report more positive experiences with FTF communication than Indian students (Table 3, column labeled "Diff"). In contrast, Indian students, while still favoring FTF overall, consider virtual and social media communication comparably effective. Responses from Indian students suggest that virtual and social media communications can be just as effective as FTF interactions (Q25-26 & Q28-29). Once again, U.S. students favor a direct, task-focused, and data-driven style of communication, where effectiveness means clarity, efficiency, and quick progress toward completion. In contrast, Indian students prefer a layered, flexible approach that blends digital and face-to-face channels and gives equal weight to relationship-building and task work, using dialogue to build trust and cohesion. Social media use makes this difference even clearer. U.S. students dismiss it as irrelevant, while Indian students see it as a valid way to strengthen ties—showing that for them, communication is both about completing the task and about nurturing personal connections. In essence, these early-stage differences illustrate that where students learn shapes not only their choice of communication tools but also the very lessons they draw from teamwork—whether about completing tasks efficiently (U.S.) or about building relationships as the foundation for collaboration (India).

Table 3: Nine Elements of Initial Phase of Group Development

Element	#	Question	US (n=148)	India (n=341)	Diff.
1. Forming a group (preference)	4	I prefer to use Face-to-Face communication when forming a group rather than either Social Media or Virtual communication.	4.05***	3.75***	0.003
	5	I prefer to use Virtual communication when forming a group rather than Face-to-Face communication.	2.24***	2.71***	0.000
2. Building Trust	6	When building trust with group members early in the project, Face-to-Face communication is more effective than Social Media or Virtual communication.	4.30***	3.9***	0.000
	7	When building trust with group members, virtual communication is more effective than Face-to-Face communication.	1.97***	2.58***	0.000
	8	When building trust with group members, Social Media communication is more effective than Face-to-Face communication.	2.05***	2.57***	0.000
	9	When building trust with group members, Social Media communication is more effective than Virtual communication.	2.14***	2.74***	0.000
3. Getting to know group members	10	I learn more about my group members using Face-to-Face communication rather than Social Media or Virtual communication.	4.24***	3.82***	0.000

	11	I learn more about my group members using Virtual communication rather than Face-to-Face communication or Social Media communication.	2.22***	2.62***	0.000
	12	I learn more about my group members using Social Media communication rather than Face-to-Face communication or Virtual communication.	2.24***	2.73***	0.000
Element	#	Question	US (n=148)	India (n=289)	Diff.
4. Forming a group (effectiveness)	13	When forming a group, my experience is Face-to-Face communication is more effective than Social Media or Virtual communication.	4.38***	3.80***	0.000
	14	When forming a group, my experience is either Social Media or Virtual communication is more effective than Face-to-Face communication.	2.08***	2.51***	0.000
5. Group leader pick	15	When determining group leader, Face-to-Face communication is better than Social Media or Virtual communication.	4.08***	3.85***	0.030
	16	When determining group leader, Virtual communication is better than Face-to-Face communication.	2.41***	2.51***	0.302
	17	When determining group leader, Social Media communication is better than Face-to-Face communication.	1.86***	2.36***	0.000
6. Group's direction	18	When establishing the group's direction, face-to-Face communication is better than Social Media or Virtual communication.	4.24***	3.70***	0.000
	19	When establishing the group's direction, virtual communication is better than Face-to-Face communication.	2.22***	2.54***	0.001
	20	When establishing the group's direction, Social Media communication is better than Face-to-Face communication.	1.97***	2.47***	0.000
7. Managing cliques	21	When managing cliques (*subgroups), Face-to-Face communication is better than Social Media or Virtual communication.	3.59***	3.56***	0.726
	22	When managing cliques (*subgroups), Virtual communication is better than Social Media or Face-to-Face communication.	2.81*	2.91	0.302
	23	When managing cliques (*subgroups), Social Media communication is better than Face-to-Face or Virtual communication.	2.49***	2.84*	0.000
8. Getting project information (individual level)	24	I usually get more information about the group project by having Face-to-Face meetings than Social Media or Virtual meetings.	3.84***	3.55***	0.005
	25	I usually get more information about the group project by having Virtual meetings than Face-to-Face meetings.	2.46***	2.96	0.000
	26	I usually get more information about the group project by having Social Media meetings than Face-to-Face meetings.	2.19***	2.98	0.000
9. Sharing project information (individual level)	27	New information is more easily presented through Face-to-Face meetings than Social Media or Virtual meetings.	3.65***	3.4***	0.031
	28	New information is more easily presented through Virtual meetings than Face-to-Face meetings.	2.97	3.11	0.185
	29	New information is more easily presented through Social Media meetings than Face-to-Face meetings.	2.57***	3.12	0.000

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Doing Stage

In the Doing stage (i.e., Norming–Performing), teams establish trust and clear roles, enabling smooth collaboration that evolves into high productivity and effective problem-solving toward shared goals (Bonebright, 2010; Tuckman & Jensen, 1977). During this stage (see Table 4, below), similar trends persist. Both groups prefer FTF, although Indian students see virtual and social media as equally effective for information sharing, peer learning, and group cohesion (Q34-35, Q37-38, & Q52-53). Their nuanced acceptance of digital communication contrasts with U.S. students' preference for more direct, explicit methods. Nevertheless, while their rejection of social media remains strong, U.S. students acknowledge that virtual meetings can be efficient for task-related communication (Q54-56) and value virtual meetings during later stages of the project (Q60-62). The post-COVID context likely influenced these preferences. While students previously favored FTF even with travel constraints (Choi, Zeff, & Higby, 2018; Cramton, 2001; Denstadli, Julsrud, & Hjorthol, 2012), remote learning increased awareness of the convenience of digital communication. U.S. students now show more acceptance of virtual tools in the final phase of group projects, particularly for compiling contributions (Q61). In contrast, Indian students consistently value digital communication for enhancing group cohesion and trust (Q51-53 and Q57-59). Rooted in high-context culture, they benefit from multiple contact points and contextual cues, which help maintain alignment within the group. While U.S. students focus on efficiency and clarity, Indian students emphasize relational and contextual understanding in selecting communication tools, reflecting a broader interpretation of effective collaboration.

Table 4: Eleven Elements of Doing Phase of Group Development

Element	#	Question	US (n=148)	India (n=341)	Diff.
1. Getting members engaged	30	Getting team members engaged in project activities is easier through Face-to-Face communication than Social Media or Virtual communication.	3.92***	3.70***	0.033
	31	Getting team members engaged in project activities is easier through Virtual communication than Face-to-Face communication.	1.97***	2.79**	0.000
	32	Getting team members engaged in project activities is easier through Social Media communication than Face-to-Face communication.	2.00***	2.75***	0.000
2. Information sharing (group level)	33	Face-to-Face meetings more easily allow new information about completing the task to be presented than Social Media or Virtual meetings.	3.81***	3.64***	0.112
	34	Virtual meetings more easily allow new information about completing the task to be presented than Face-to-Face meetings.	2.86	2.93	0.539
	35	Social Media meetings more easily allow new information about completing the task to be presented than Face-to-Face meetings.	2.54***	2.96	0.000
Element	#	Question	US (n=148)	India (n=518)	Diff.
3. Peer learning (individual level)	36	I usually learn more from my group members by having Face-to-Face meetings than Social Media or Virtual meetings.	4.19***	3.88***	0.000
	37	I usually learn more from my group members by having Virtual meetings than Face-to-Face meetings.	2.38***	3.08	0.000
	38	I usually learn more from my group members by having Social Media meetings than Face-to-Face meetings.	2.08***	3.00	0.000
Element	#	Question	US (n=148)	India (n=341)	Diff.
4. Task accomplishment (individual level)	39	I accomplish more tasks during Face-to-Face meetings than Social Media or Virtual meetings.	4.05***	3.65***	0.000
	40	I accomplish more tasks during Virtual meetings than Face-to-Face meetings.	2.41***	2.75***	0.000
	41	I accomplish more tasks during Social Media meetings than Face-to-Face meetings.	2.03***	2.66***	0.000

5. Task accomplishment (group level)	42	My experience is that the group accomplishes more tasks during Face-to-Face meetings than Social Media or Virtual meetings.	3.97***	3.72***	0.010
	43	My experience is that the group accomplishes more tasks during Virtual meetings than Face-to-Face meetings.	2.57***	2.77***	0.059
	44	My experience is that the group accomplishes more tasks during Social Media meetings than Face-to-Face meetings.	2.05***	2.65***	0.000
6. Group efficiency	45	*r_ Groups waste more time during Face-to-Face meetings than Social Media or Virtual meetings.	2.89	2.68***	0.074
	46	*r_ Groups waste more time during Virtual meetings than Face-to-Face meetings.	2.73***	3.22***	0.000
	47	*r_ Groups waste more time during Social Media meetings than Face-to-Face meetings.	3.24*	3.35***	0.363
7. Effective interaction	48	More effective interactions occur in Face-to-Face meetings than in Social Media or Virtual meetings.	4.14***	3.81***	0.002
	49	Interaction in Virtual meetings is more effective than in Face-to-Face meetings.	2.43***	2.57***	0.149
	50	Interaction in Social Media meetings is more effective than in Face-to-Face meetings.	2.03***	2.56***	0.000
8. Group cohesion	51	Face-to-Face communication increases group cohesion (oneness) more than Virtual or Social Media communication.	4.03***	3.72***	0.001
	52	Virtual communication increases group cohesion (oneness) more than Face-to-Face communication.	2.57***	3.07	0.000
	53	Social Media communication increases group cohesion (oneness) more than Face-to-Face communication.	2.32***	3.04	0.000
9. Group effectiveness	54	Face-to-Face communication increases group effectiveness more than Virtual or Social Media communication.	3.89***	3.87***	0.819
	55	Virtual communication increases group effectiveness more than Face-to-Face communication.	2.46***	3.09	0.000
	56	Social Media communication increases group effectiveness more than Face-to-Face communication.	2.22***	3.00	0.000
10. Group Trust (during the project)	57	During the project, Face-to-Face communication increases group trust more than Virtual or Social Media communication.	4.14***	3.82***	0.000
	58	During the project, Virtual communication increases group trust more than Face-to-Face communication.	2.27***	3.02	0.000
	59	During the project, Social Media communication increases group trust more than Face-to-Face communication.	2.14***	2.90	0.000
11. Preference (final stage)	60	I prefer to use Face-to-Face communication when completing the task rather than Social Media or Virtual communication.	3.54***	3.73***	0.109
	61	I prefer to use Virtual communication when completing the task rather than Face-to-Face communication.	2.92	2.70***	0.043
	62	I prefer to use Social Media communication when completing the task rather than Face-to-Face communication.	2.24***	2.62***	0.000

Notes: *r_: reverse worded, *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Overall, these Doing-stage patterns show that U.S. and Indian students take different paths to reach the same goal—working together smoothly and finishing the project. U.S. students usually begin with a higher level of assumed trust (Delhey et al., 2011), so they rely on clear, direct, and efficient ways of communicating to get work done. Indian students, on the other hand, see trust as something that must be built and maintained through conversation and repeated interactions. For them, communication tools that allow relationship-building and ongoing contact—such as virtual meetings and social platforms—feel more effective for keeping the group aligned. Once trust is established—whether assumed from the start in the U.S. or developed over time in India—both groups are able to collaborate productively in the Doing stage.

Furthermore, national culture shapes not only how students communicate during teamwork, but also what they take away from the experience. In U.S. student groups, the Doing stage focused on skills like organizing tasks, clarifying roles, documenting work, and quickly pulling everything together—skills that reflect a preference for direct and

efficient coordination. In Indian student groups, the same stage emphasized different abilities, such as seeing things from others' perspectives, managing emotions, and building ongoing trust and cohesion. Both sets of skills are valuable; they simply emerge at different times and with different emphases depending on cultural context. This suggests that culture influences not just the methods of communication, but the outcomes of what students ultimately learn through teamwork.

Completion/Outcome Stage

In the completion phase (i.e., Adjourning), teams disband after completing their objectives, and members experience a mix of accomplishment, relief, and sometimes loss as they transition out of the collaborative process (Bonebright, 2010; Tuckman & Jensen, 1977). In this phase (see Table 5, below), both groups favor FTF for increasing satisfaction with group members and outcomes. However, Indian students show a more differentiated perspective. They agree on the importance of FTF (Q63 & 66) but are more accepting of the positive impact of virtual and social media communication than U.S. students (Q64-65 & 67-68). These findings further underscore the cultural dimensions of communication satisfaction and the varying roles that digital tools play in achieving group harmony and successful outcomes.

Table 5: Two Elements of Completion/Output Phase of Group Development

Element	#	Question	US (n=148)	India (n=518)	Diff.
1. Satisfaction w. members	63	I am more satisfied with my group as a result of using Face-to-Face meetings than Virtual or Social Media communication.	3.89***	3.82***	0.409
	64	I am more satisfied with my group as a result of using Virtual communication than Face-to-Face meetings.	2.62***	3.10	0.000
	65	I am more satisfied with my group as a result of using Social Media communication than Face-to-Face meetings.	2.14***	3.04	0.000
2. Satisfaction w. outcomes	66	I am more satisfied with group outcomes as a result of using Face-to-Face meetings than Social Media or Virtual meetings.	4.05***	3.81***	0.005
	67	I am more satisfied with group outcomes as a result of using Virtual meetings than Face-to-Face meetings.	2.54***	3.05	0.000
	68	I am more satisfied with group outcomes as a result of using Social Media meetings than Face-to-Face meetings.	2.3***	3.01	0.000

*** $p < 0.001$

CONCLUSIONS AND IMPLICATIONS

Our study highlights how national culture shapes communication preferences and practices within group projects. While both U.S. and Indian students prefer FTF interaction, U.S. students strongly favor directness and efficiency, reflecting their low-context, data-oriented culture. Indian students, on the other hand, exhibit openness to virtual and social media communication, aligning with their high-context, dialogue-oriented culture. These insights underscore the importance of cultural sensitivity in academic and professional team settings, particularly as remote collaboration becomes increasingly common. By understanding the cultural foundations of communication preferences, educators and managers can better support multicultural team effectiveness and satisfaction across all stages of group development. Moreover, because individual differences in communication styles exist even within homogeneous groups, cultivating sensitivity to these differences can help any team collaborate more effectively by understanding and accommodating one another's unique approaches. Several implications are particularly relevant for instructors preparing students for today's global environment.

First, instructors might encourage students to consider incorporating diverse communication methods into their group projects both to enhance team performance for the course assignment and to learn how to leverage the strengths of team diversity in future job-related group efforts. As demonstrated in this study, although FTF interaction is universally preferred, integrating multiple communication methods (FTF, virtual, social media) can maximize group satisfaction and effectiveness when accommodating cultural and/or individual differences. For instance, instructors might recommend digital communication channels specifically for relational and trust-building activities, especially benefiting students from dialogue-oriented cultures like India. Additionally, while suggesting communication options to students, instructors might require them to set clear expectations that balance structure with flexibility, addressing

U.S. students' preference for clarity and efficiency, and guiding Indian students on effectively leveraging multiple communication channels. Explicit communication guidelines will facilitate effective collaboration.

Second, instructors can provide cultural sensitivity training before the start of group projects. By offering initial training sessions or briefings on cultural dimensions of communication (e.g., dialogue-orientation vs. data-orientation, high-context vs. low-context, and individualism vs. collectivism), instructors can raise student awareness about diverse communication styles and preferences. Additionally, during the initial stage of group development, instructors could recommend icebreakers (FTF and/or virtual) specifically designed for relational and trust-building activities. These activities are valuable not only for students from dialogue-oriented cultures like India but also for students from data-oriented cultures like the U.S. Virtual icebreakers in particular are short, interactive exercises intended to lighten the mood, typically at the beginning of classes or meetings, while not being intrusive. Especially beneficial in online and hybrid settings, these icebreakers help make virtual meetings more personal, allowing team members to get to know each other better and enjoy some social interaction (Mrvova, 2022).

Lastly, given evolving attitudes post-pandemic, instructors could highlight the efficiency of digital platforms during later project stages and explicitly discuss their limitations early on. Such early discussions can help students establish clear communication expectations, thereby mitigating potential process losses and facilitating the development of a well-chosen communication structure in advance.

However, instructors' efforts alone are insufficient without student participation. Students might proactively learn about and adapt to their peers' culturally-driven communication styles to enhance group effectiveness and satisfaction. For instance, proactive management of expectations is critical during the early stages of group development (DeChurch & Mesmer-Magnus, 2010). Students from different cultural backgrounds may discuss preferences and establish mutual expectations early to reduce misunderstandings and optimize communication effectiveness throughout the project. Furthermore, students could strategically select communication platforms based on specific project stages and goals. For example, prioritizing FTF interactions initially for trust-building and virtual tools later for task efficiency. Finally, regular reflection on how communication choices influence group dynamics and outcomes can help students continuously enhance their cross-cultural collaboration skills. For instance, teams might reserve the last 10 minutes of each weekly meeting to identify one communication breakdown, explore how cultural expectations contributed to it, and agree on an adjustment for the following week.

Importantly, students from both groups can learn a great deal from one another when they recognize and embrace these cultural differences. U.S. students could benefit from appreciating the value of relational dialogue and trust-building as foundations for collaboration, while Indian students might strengthen their efficiency by adopting more explicit, task-focused practices. By understanding and respecting alternative communication styles, both groups can expand their teamwork repertoires and become more adaptable collaborators in increasingly multicultural learning and work environments. Understanding differences between Indian and American students also helps both sets of respondents recognize differences between all team members, whether from different or similar cultures/backgrounds.

Today's world is increasingly mediated by AI, and digital communication platforms are rapidly incorporating AI-driven features such as automated translation, meeting summaries, and content recommendations (Yuxiu, 2024). Although AI has the potential to greatly enhance productivity, it may also accelerate stereotyping and snap judgments, reinforcing existing biases and discrimination (Watson, 2025; Alon-Barkat & Busuioc, 2023). One more implication of our findings concerns the sensitivity of team members to cultural diversity. The results of our study show that using a combination of communication methods (FTF, virtual, and social media) can encourage individuals to move beyond their comfort zones. This process provides a kind of mirror, helping members recognize and reflect on their own culturally centered biases while deepening their understanding of cultural diversity. Such awareness is essential for counteracting AI's tendency to favor commonalities and predictable, routine-based approaches (Doshi & Hauser, 2024). Anything that disrupts these routines and heightens awareness of diverse cultural perspectives can both improve collaboration and enhance cultural intelligence. By consciously suppressing the negative elements of AI—particularly those that may amplify bias or limit perspective—educators, managers, and students can use AI more effectively while being more culturally responsive.

Taken together, our findings contribute to business education innovation by offering an evidence-based, culturally responsive design for teaching and assessing teamwork communication in contemporary business curricula. Rather than treating “good teamwork” as a one-size-fits-all skill, this study translates cultural theory and cross-national evidence into a phase-based instructional framework: instructors can deliberately match communication channels (FTF, virtual meetings, social media) to team objectives (e.g., trust formation, coordination, execution, reflection) and

make those choices explicit learning targets. This approach supports innovative teaching practices such as structured communication charters, staged media requirements, guided reflection on communication breakdowns, and AI-supported collaboration with safeguards against bias and overreliance. In doing so, our study offers actionable guidance for designing inclusive team projects that help students strengthen cross-cultural communication, digital teamwork, and cultural intelligence.

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Inspiration from Desperation: Developing Innovative Solutions for Academic Program and Student Success

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ABSTRACT

Risk Management and Insurance, a unique program in an AACSB-International accredited college of business, faced a major threat when its primary employer in the region moved its operations center. Over the first couple of years, enrollment remained somewhat steady but eventually dropped and the program faced closure as it was designated as a low completer program in the state. The guarantee of good paying jobs at a national firm located in the region had served as a strong recruiting tool, internship provider, and post-graduation employer for the program since its inception. Out of desperation, faculty rebuilt the program using a holistic approach to meeting student and industry needs. This paper focuses on program development and measures of success and offers a model for programs who might find themselves in similar situations.

Keywords: academic program innovation, student success, AACSB, Risk Management and Insurance

INTRODUCTION

University academic program health and success can be defined and determined in multiple ways. Depending on the focus of regional and discipline-based accrediting bodies, state legislatures, state and local governing boards, and individual institutional guidelines, the health, viability and strategic priority of a program can be multifaceted and complicated (see, for example AACSB, 2020; SACSCOC, 2024). The purpose of this manuscript is to provide a discussion of some of these measures of success and apply them to a program that has been designated as one in distress. Details about how inspiration came from desperation to reposition a program by focusing on learner success by deploying innovative solutions for recruitment, retention, graduation, and placement are provided. Evidence of success is provided along with comparisons to other majors.

Environmental and individual program circumstances at a given time often dictate the review process, criteria, metrics for success, and timeline associated with the review. For example, in times where state investment in higher education is being reduced, a higher priority might be given to program enrollment (self-generated income) and in-state market demand for graduates. In this particular case, an undergraduate AACSB-International accredited Risk Management and Insurance (RMIN) academic program in a rural area part of a southern state that was disinvesting in higher education found itself in a low completer review process. Additionally, a major employer, a regional office of a national, well known, mutual insurance company, announced its departure from the region taking with it 1,100 jobs and an annual \$50 million in payroll (Insurance Journal, 2004). The regional office opened in Monroe in 1968 and shortly afterwards in 1972, the Risk Management and Insurance academic program received initial accreditation from AACSB-International. The two were intricately tied together - the organization invested in the program with financial support for scholarships and an endowed professorship to support teaching, research and service, as well as provided internships and full-time employment opportunities. The existence of the company had provided numerous engagement opportunities for students through local chapters of insurance organizations, company tours, and guest lectures in classes.

Shortly prior to the announcement of the closure, the Director of the Risk Management program left the university. A new director was recruited to the program and had to address the fallout of the regional office closure and the impact on the academic program. Primarily due to the negative press related to the closure, enrollment in the program dropped significantly which eventually led to the program being placed on the state's low completer list a few years after the announcement. This low completer designation and the fact there was no longer a major employer in the region for the program led to the significant question as to whether the program should continue, and if it did, what should its purpose be.

The remainder of this manuscript discusses higher education and the field of risk management and insurance to provide background related to opportunities, a brief overview related to defining academic program quality, a description of innovative programs that were implemented, results of those innovations, and summary conclusions.

HIGHER EDUCATION AND THE FIELD OF RISK MANAGEMENT AND INSURANCE

Over the years, public discourse around higher education has focused on many facets, including its primary purpose and whether or not it is a public good. Both issues are complex, and beyond the scope of this paper. However, several basic thoughts are worth mentioning as they offer an evaluative point of reference for academic program success. It is important to point out the differences between the purpose of higher educational institutions and higher education, as provided by the following two researchers.

Benbassat (2024) summarized the multipurpose nature of higher educational institutions as the need to “explore knowledge, foster reflective capacity, train the workforce, prepare for a career, and promote personal and regional development.” Ashwin (2022) argued that it is important to differentiate between the purposes of higher education institutions and the purposes of education. In his pursuit to study the purpose of education, he evaluated 80 volumes of journals published in the peer-reviewed journal *Higher Education* over the time span of 1972-2020. His evaluation determined that the top three purposes were 1) production of a skilled workforce (73%), 2) development of critically reflective individuals (50%), and 3) development of a critically reflective society (41%).

Gallup and the Lumina Foundation conduct a formal research project each year to assess the status of higher education. The most recent report (Gallop, 2025) included responses from 14,000 adults who have not earned a higher education credential. The consensus was that the return of personal higher education investments was still worth the investment, where 80% of the respondents indicated they would likely enroll in a program within the next five years. A majority of the participants (85%) also indicated they were confident that a degree or credential would provide job-related skills leading to a job they love doing or provide enough income to live comfortably.

One of AACSB’s (AACSB, 2020) primary goals is to “encourage business schools to hold themselves accountable for improving business practice through a commitment to strategic management, learner success, and successful thought leadership.” Concurring with Ashwin and considering that students believe higher education is still a worthwhile investment, and while it is important to recognize the significance of strategic management and successful thought leadership, one could easily argue the most important component of this definition is learner success when it comes to the purpose of higher education.

Innovation is also a critical component of AACSB’s standards. In their strategic planning standard 1.3, it clearly states that innovation is a key aspect of continuous improvement. Additionally, in the standards related to learner success, it is stated that “curriculum and program management, including assurance of learning programs, should include innovation, experiential learning, and a lifelong learning mindset.” Furthermore, programs should include meaningful learner-to-learner and learner-to-faculty and academic and professional engagement.

Based on these limited studies and points, one can argue that the primary purpose of higher education is to focus on the learner and prepare them for a successful career. This belief was the impetus for and the ongoing motive for innovative solutions to the impacted Risk Management and Insurance program. Risk Management and Insurance remains a unique and underrepresented major across the United States. AACSB (2025) indicated there were only thirty-eight Risk Management and Insurance undergraduate academic programs in the United States in 2024, representing approximately 8% of the total business academic programs across the country. While the insurance industry is widely known by most individuals due to the requirements to get a mortgage, drive a car, protect their family’s health, and long-term financial future, many are not familiar with career aspects associated within business insurance. Even more so, individuals are not familiar with specialty areas such as reinsurance and surplus lines.

The industry provides a wide variety of career opportunities including insurance sales, brokers, customer service representatives, claims adjusters, underwriters, actuaries, and technology. Combs (2025) points out that the future of the industry will depend on people and technology, as the baby boomers retire out of the industry and Gen Z and Gen Alpha move in. Emerging technologies, such as artificial intelligence, are being deployed across the industry. Fortunately, Gen Z and Gen Alpha members are able and well adapted to deploying these technologies.

Over the past ten years, the industry has faced a talent gap. And, according to Risk and Insurance (2024), hiring in the industry is expected to remain strong over the next year. Positions such as underwriters, claims adjusters, insurance analytics professionals, and actuaries will see the largest increases in hiring, according to this survey. The industry, like many others, is facing the employment challenge created by the retirement of members of the baby boom

generation (Combs, 2025).

DEFINING ACADEMIC PROGRAM SUCCESS

Beyond the low completer assessment, which focuses on an average number of graduates over a given period of years, numerous models have been developed that focus on a holistic approach for program assessment. One of the more prominent models for evaluating academic programs was designed by Dickeson (2010) who argued that academic programs should be aligned with a university's mission such that the university has the most efficient and productive academic program portfolio to serve its purpose. As pointed out by Dickeson, the evaluative process can be daunting and somewhat ambiguous. Academic programs should meet the needs of industry and demands of students, parents, communities, and the political environment. He provides a list of 10 areas that should be considered when evaluating academic programs: 1) history, development, and expectations of the program, 2) external demand for the program, 3) internal demand for the program, 4) quality of program inputs and processes, 5) quality of program outcomes, 6) size, scope, and productivity of the program, 7) revenue and other resources generated by the program, 8) costs and other expenses associated with the program, 9) impact, justification, and essentiality of the program, and 10) opportunity analysis of the program (Dickerson, 2010).

McGowan (2019) evaluated 53 different academic program review processes across the United States to determine best practices and common threads. Her content analysis identified the top components of program review processes to be: 1) outcome assessments, 3) program necessity, 4) student learning outcomes, 5) program vision and mission, and 6) enrollment. Most of the items offered by Dickeson and McGowan are self-explanatory. However, since program outcomes (outcome assessments) may not be clear cut, following are some examples provided by Dickeson (2010): measures of graduate satisfaction, job placement and success, graduate and professional school acceptance, recognition and awards, employer satisfaction surveys, and alumni support. Student learning outcomes were listed by McGowan as a separate item, whereas Dickeson included it as a program outcome.

As can be seen by these two models, measuring program success can be tedious and time consuming. Some authors argue that career readiness and engagement are the important criteria. Myers, et al. (2024) found that career planning, professional social media workshops, and mentorships were found to be most attractive approaches to students in an AACSB-accredited program. The authors argued that career readiness was essential for long term career success as the focus on grades has shifted given the changes in society (for example, graduates changing jobs 14 times during their career) to both academic and non-academic skills.

Porca, et al. (2025) reviewed strategies to enhance student engagement, specifically live based learning (LBL) programs which includes bringing real-world experiences into the classroom. Their results suggested that students who participate in LBL programs demonstrate higher engagement in career-related activities and improved career readiness, which leads to career success.

INNOVATION FROM DESPERATION

Given the program was at risk of closure, a decision was made to revamp the purpose of the program to focus on career readiness and learner success. It was assumed that if these two criteria became the primary emphasis, all of the other measures of program and student success would be satisfactory. If students were able to be career ready and to achieve long-term career success, the program would be successful. To accomplish this, the program needed to recruit, retain, prepare, and graduate students and engage them as alumni after graduation. The following outlines the innovative ways in which these actions were accomplished.

Recruitment

In regard to recruiting students for the program, the current perceptions of business students who were not majoring in risk management insurance were obtained through a survey (Hollman, et al., 2003). The results indicated that most non-majors did not know much about the major or career opportunities in the field. To help address this issue, a video was created and shared via social media, faculty visited and presented information sessions to athletic teams, fraternities, and sororities. As enrollment increased, students were asked to be ambassadors for the program (they wore buttons on their backpacks that said "My Major is RMI. Ask me Why!). Jokingly, the program was often referred to as a "cult" because the students felt so much a part of the program and enjoyed recruiting new "members." Additionally, faculty members began guest lecturing in the required introduction to business class to talk about risk

management. They identified a local high school known for its high ability students and taught the class onsite at the high school. This eventually led to the high school offering a section of the first risk management and insurance class for the program. During one academic year, over half of the class enrolled at the university and 4 became risk management and insurance majors—all four graduated and are experiencing great careers. Finally, the faculty participated in a federal grant application that led to \$1.4 million in funding from the US Department of Labor that retrained high school business faculty in the region to teach business classes, one of which was risk management and insurance.

Results

As shown in Table 1, enrollment in the program has grown to a respectable number and has stabilized. In 2004, enrollment was 24, compared to average enrollment of 159 for the other 6 business programs. (LA Board of Regents, 2025). Enrollment in the program has grown over 300% in the last 20 years while its counterpart business programs have seen declines in enrollment on average. Since 2020, the program has ranked second or third in size when compared to all other business programs. In most of those years, it was ranked 1st for discipline-specific majors, that is if you did not consider general business, which has traditionally been the largest major of all business majors. Additionally, the program received national recognition by *Business Insurance* magazine by being included in national rankings of all RMIN academic programs (top 10 twice). Rankings were based on size and number of graduates.

Table 1: Program Enrollment

Cohort	RMIN	AVG*	Size Rank
Fall 2004	24	159	7
Fall 2020	118	65	2
Fall 2021	98	57	2
Fall 2022	63	53	3
Fall 2023	77	58	3
Fall 2024	83	59	2

*Average enrollment of all other discipline specific business majors.

Retention

As student enrollment began to increase and stabilize, retention tools were put in place. Typical tools such as student organizations, guest speakers, company tours, internships, study sessions, and social outings were deployed. In addition to these efforts, the program began using an online personality assessment tool (16 Personalities) to help students gain a better understanding of themselves. Wang, et al. (2006) and Lent, Brown and Hackett (1994), among others, found that personality plays a role in a student's career choice. Given the diversity of career opportunities in insurance for introverts and extroverts, this assessment proved extremely beneficial. Faculty used this assessment tool to help students further investigate appropriate career pathways in the industry, usually spending more than an hour per student in a one-on-one setting in addition to several classroom settings discussing personality types and associated characteristics.

While internships are often used to help retain students by providing practical exposure to the field, many of the students could not participate in out-of-the-area internship opportunities due to high costs of transportation and housing. To help alleviate this issue, program faculty worked with College administration to develop an Internship Support Fund that provided housing and transportation assistance to students interning in high-cost areas. The first recipient of the funds, an RMIN student, interned in London for a summer and went on to work full-time for the company's US subsidiary after graduation. The fund supported RMIN students interning in places such as California, New York, Boston, Atlanta, Birmingham, and New Orleans. The program later created their own fund that is now endowed to support RMIN students' travel to high-cost areas for internships.

Student conferences are also commonly used to engage and retain students. Additionally, RMIN faculty worked with industry leaders to allow students to attend, free of charge, state-wide insurance association conferences and meetings, with several groups even providing housing. Students were able to engage with professionals in the field and attend the same professional development sessions as insurance professionals.

Finally, given the program's focus on surplus lines insurance, faculty began mentoring and working with students to better equip them to compete for the highly competitive Wholesale and Specialty Insurance Association (<http://wsia.org>) internship. This internship is one of the most selective in the industry and exposes students to multiple aspects of the surplus lines industry. Selectees receive pay, travel to and from the various companies, housing, industry mentors, access to conferences, and a \$5,000 scholarship after successful completion of the internship. For each of the past five years, students from this program have been selected as participants in the program. As shown in Table 2, the programs 2nd fall semester retention rates in the program far exceed those of the university as well as those for the other discipline-specific business majors.

Table 2: Program Retention 1-3

Cohort	Univ	RMIN	Other Bus
Fall 2020	28	43	32
Fall 2021	33	60	23
Fall 2022	35	67	33
Fall 2023	39	67	37

Preparation

To be successful, the program had to be evaluated and revised to ensure that graduates were career ready and employable. The program had been primarily a producer of employees for the regional office of a national mutual fund insurance company. Through analysis with internal and external constituents, a decision was made to focus more efforts on a niche area within the insurance industry, surplus lines and reinsurance. While the program would still provide the skills necessary for graduates to be agents or work in corporate insurance offices, graduates would obtain specialized education that only a few programs in the country provided. The program had already offered a class in surplus lines and reinsurance, but going forward, it would become a high-profile component of the program. The new director of the program was formerly the Vice President of Training for a national surplus lines company and brought significant industry experience with her to the program.

Like most programs, the educational component focused on classroom instruction, engaging activities such as guest lecturers, a mentorship program, a discipline specific speaker series, and field trips. In addition, given the entrepreneurial spirit of Gen Z, a funded business plan competition was launched in the program. Students, as part of a course requirement, work in teams and with a program alumnus, to develop an insurance product that would be part of the surplus lines industry. The groups work with faculty members and their mentors to develop the product and the business plan. The students then "pitch" the plan to a group of industry experts who judge the presentations and award cash prizes to the winners. The fund for prizes has now been endowed to ensure sustainability of the program. This program exposes the students to industry leaders, requires them to complete research to identify future opportunities and gaps in current policies, and improves their communication and presentation skills.

Additionally, as part of their Business Risk Management course, students are required to complete ten field interviews with small business owners to assess their current risk management situation and help identify any needs they might have. Students are required to develop a formal report for one of the businesses making recommendations on how to improve the risk management plan for that business.

Graduation

Low graduation numbers were the impetus for the innovations deployed in the program. As shown in Table 3, completers over the past five years far exceeded the required 8 per year. Also shown is the average for the other business discipline-specific majors, RMIN exceeds the average each of the five years of data provided. Additionally, the program produces a disproportionate percentage of graduates compared to all business majors.

Table 3: Completers by Academic Years

Academic Year	RMIN	Bus Avg*	Total of All Business Degrees
2020-2021	29	14	26%
2021-2022	34	15	25%
2022-2023	20	13	21%
2023-2024	22	14	21%
2024-2025	29	11	30%

*Average number of graduates for 6 other business majors

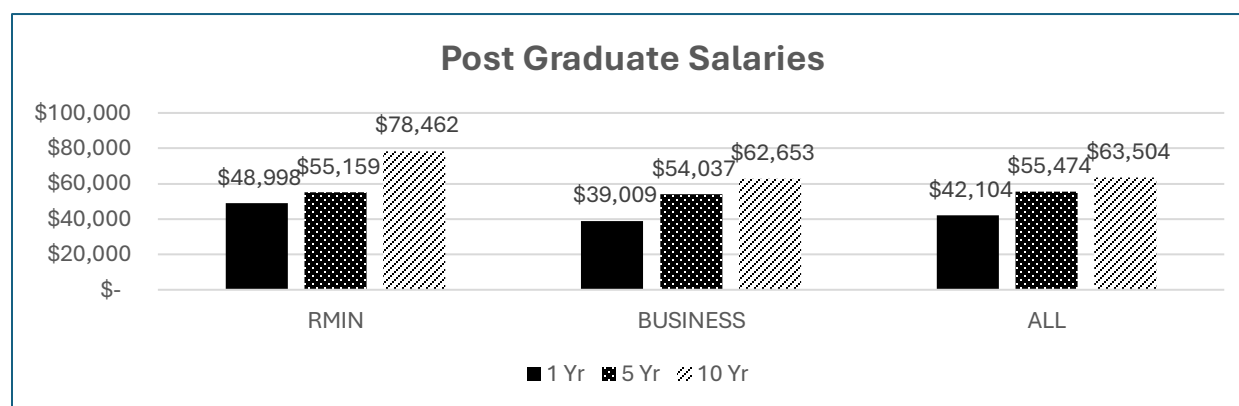
**Percentage of RMIN graduates for all 7 business majors

Placement

The program implemented its own career fair which brings approximately 15 -20 employers on campus each year. Four of the five largest wholesale insurance companies in the United States recruit the students from the program. Students are required to contribute a personal profile which, in addition to normal resume components, includes personal preferences of what part of the industry they prefer to work in as well as geographic location preference. The career profile book is provided to all participants in the career fair and to major recruiters who pursue the program's students.

The program has maintained nearly a 100% satisfactorily occupied percentage (6 months after graduation) for the past five years. Satisfactorily occupied means a graduate has been employed, accepted to a graduate or professional program, or is not looking for employment in the field. Most students have accepted jobs prior to graduation.

According to data (Figure 1) provided by the US Census Bureau and the Post-Secondary Employment Outcomes Explorer (2025), the RMIN program graduates (since 2001) have shown to earn higher salaries at each benchmark criteria, 1 year post-graduation, 5 years post-graduation, and 10 years post-graduation when compared to other university business programs and all university programs.

Figure 1: Post Graduation Salaries

Alumni Engagement

After graduation, the program continues to involve alumni in the program. As commonly found, alumni are engaged by returning to campus for speaking engagements, alumni reunions, and board engagement. In addition, the program has its own alumni group, career fair, advisory board, and social events that allow alumni to engage with fellow alumni and current students. As mentioned previously, alumni are also engaged in mentorship activities, the business plan competition, and class presentations. The RMIN alumni association is one of only 4 special group alumni associations within the university alumni association. The group provides funding for the program, engagement opportunities within the group for members, as well as with engagement with faculty and students.

CONCLUSION

Facing a dire situation of program closure helped create an innovative, forward-thinking, program environment that led to successful learner and program outcomes. By focusing on the strengths and unique attributes of the program, and the needs of an industry, this particular RMIN program was able to move from a dire situation to one of national recognition where four of the five largest wholesale insurance companies seek out their students for internships and full-time post-graduation positions. The industry has supported the program through financial contributions to create innovative programs such as the internship support program, the business plan competition, scholarships, conference participation, endowed professorships, and an endowed Chair for faculty. Additionally, alumni support the program by serving as mentors, competition judges, and recruiters for the program. And most importantly, students of the program graduate into jobs that are great fits for their personality, life preferences, and career goals.

This paper adds to the literature by providing contextual examples of innovative solutions to challenges that might be facing traditional business programs, especially dealing with recruitment, retention, placement, and alumni engagement. Additionally, given collegiate enrollment challenges across the country related to what some refer to as the “enrollment cliff,” this paper shares examples of how undergraduate academic programs can engage with feeder schools to market their programs. It further examines commonly followed program evaluation frameworks and offers additional measures of success, for example internship support funds, industry engagement, and career placement, to name a few. Finally, the paper uses tools, such as the federal census bureau’s post-secondary program outcomes explorer, which might not be known to many researchers or academic program reviewers.

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Essential Soft, Technical, and Digital Skills for Undergraduate Business Students in the Digital Age: A Multidisciplinary Review

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ABSTRACT

In the age of AI, the business landscape is evolving, requiring future business majors to adapt to the 21st-century workforce. Research shows that success in accounting, finance, and management relies on a blend of technical, digital, and soft skills. This multidisciplinary literature review identifies essential skills for undergraduate business students in each discipline while also noting recent research on the economic returns realized by students who develop complementary soft and technical skills. Furthermore, key common soft skills among these disciplines identified include adaptability, leadership, problem-solving, teamwork, communication, and ethics, while common critical digital skills encompass artificial intelligence literacy and data analysis. To thrive, future business graduates in these disciplines need to develop proficiency in these areas as well as know how to integrate technical knowledge with soft and digital skills to foster innovation and efficiency. Mastery of these skills will be crucial for maintaining competitiveness in the ever-evolving business world.

Keywords: Digital skills, soft skills, accounting, finance, economics, management, interdisciplinary, business

INTRODUCTION

Over a century ago, Charles Mann (1918) conducted pivotal research on the significance of integrating soft skills education within both educational institutions and workplaces. He underscored the value of personal qualities such as common sense, integrity, resourcefulness, initiative, tact, thoroughness, accuracy, efficiency, and interpersonal understanding. Mann asserted that these attributes are as crucial as technical skills and expertise.

Subsequent research by renowned institutions such as Harvard University, the Carnegie Foundation, and the Stanford Research Center revisited Mann's findings, concluding that 85 percent of job success is attributable to well-developed soft skills. In comparison, only 15 percent is linked to technical knowledge (Carey, 2016).

Soft Skills Categories

Soft skills are categorized into two main types: interpersonal skills and intrapersonal skills. Interpersonal skills, which involve interactions with others, include active listening, effective questioning, teamwork, conflict resolution, and empathy (Colburn, 2018). Intrapersonal skills focus on self-awareness and self-management, encompassing abilities such as self-awareness, proactiveness, goal setting, time management, and perseverance (Colburn). Both categories are transferable across various jobs.

Increasing Demand for Soft Skills

Marin-Zapata et al. (2022) highlight the growing importance of soft skills in navigating complex, team-oriented environments, alongside traditional technical skills. Li (2024) discusses the evolving workforce demands in Industry 4.0, where automation and digital transformation are reshaping roles. Soft skills like adaptability, communication, and problem-solving are becoming essential. Li calls for educational institutions and employers to update training strategies and adopt integrated learning models that enhance both digital literacy and interpersonal skills, preparing a workforce for rapidly changing professional landscapes. According to Karimi and Pina (2021) businesses are realizing the significance of soft skills for their growth and survival.

Additionally, a recent LinkedIn report titled "Skills on the Rise 2025" emphasizes the growing importance of interpersonal skills. Andrew McCaskill, a career expert at LinkedIn, suggests that the term *soft skills* may soon become outdated given their increasing relevance in today's job market (LinkedIn, 2025).

Soft Skills Gap

As the demand for soft skills rises, there is a notable shortage of adequately skilled graduates in the workforce. The 2024 survey conducted by the National Association of Colleges and Employers (NACE) reveals significant gaps between the soft skills of new graduates and the expectations of employers (Gray, 2025). Specifically, employers rate graduates' proficiency in communication, critical thinking, leadership, and professionalism lower than the graduates rate themselves. These differences emphasize the need for educational institutions to align their curricula with employer expectations, particularly in the areas of leadership and professionalism, to ensure that graduates are well-prepared for the workforce.

In a time marked by the rapid advancement of automation and artificial intelligence (AI), the significance of soft skills has become more critical than ever (Absari, 2020; Oluwalola, 2011; Orih et al., 2024; Sharma & Mehta, 2017). Soft skills are essential for achieving personal, professional, and organizational success (Deming, 2017; Deming & Khan, 2018). Both employers and educators are increasingly recognizing the vital role that soft skills play, especially as we navigate the challenges of the modern workforce. Organizations are beginning to appreciate the substantial benefits of developing soft skills within their employees (Karimi, 2020).

The Rapid Impact of Digital Transformation

Lamaree et al. (2023) highlight the significance of digital and AI transformations for organizations. While 89% of large companies are pursuing these changes, they have only realized 31% of the expected revenue increases and 25% of the anticipated cost savings. Business leaders see the potential benefits and aim to leverage these transformations effectively. Using McKinsey's Finalta benchmark, which assessed 80 global banks from 2018 to 2022 across 50 metrics, Lamaree et al. found that digital leaders significantly outperform their less advanced counterparts in shareholder value by creating unique, hard-to-replicate advantages.

Given the rapid pace of technological advancements, it is essential to identify the key skills that today's undergraduate business students need to succeed in the evolving workplace. Research by Sigelman et al. (2022) indicates that an average of 37% of the skills required for specific jobs will change within five years. This makes it crucial for educators to prepare students for lifelong learning by regularly updating the curriculum to adapt to these changes. Since 2016, over one-third of the top 20 skills required for the average U.S. job have shifted, with one in five skills being entirely new. The report highlights significant trends in essential skills, pointing out that digital and soft skills are highly sought after in the current workforce. Providing clear guidance on how to align soft, technical, and digital skills with career pathways is vital for both employers and educators.

According to Coelho and Martins (2022) and Sigelman et al. (2022), digital skills are set to be in high demand in the future workforce. A well-rounded workforce that effectively combines technical, soft, and digital skills is vital for both business success and national prosperity. Companies that cultivate a skilled workforce with this balanced skill set tend to exhibit greater levels of innovation and productivity. Yet do we fully comprehend the skills required for success in today's workforce? Research consistently indicates a strong correlation between human capital and economic growth, particularly when human capital encompasses robust competencies in soft skills (Deming, 2017; Heckman & Kautz, 2012; Robles, 2012).

Dawning of the Fifth Industrial Revolution

The Industrial Revolution profoundly transformed the conduct of commerce and the utilization of capital. The emphasis shifted from specific acquired skills to maximizing profits through a variety of resources, predominantly technical ones such as machinery. In the initial phase of the Industrial Revolution (IR 1.0), the growth cycle evolved from reliance on skilled craftspeople to the incorporation of modern machinery. The economic growth that followed this revolution underscores the necessity of developing and measuring human skills for commercial purposes.

IR 2.0 introduced electric energy and mass production, while IR 3.0 brought forth technological advancements such as automation, electronics, information technology, and IT systems (Saxena et al., 2020). The fourth phase, Industrial Revolution 4.0 (IR 4.0), originated from a government-led initiative in Germany in 2011, emphasizing technological innovation (Tavares et al., 2023). IR 4.0 is centered on the expansion of digital technologies, collectively referred to as the "Internet of Things" (IoT), which encompasses automation, machine learning, connectivity, and real-time data (p. 05). The rapid progress of the Fourth Industrial Revolution (Schwab, 2017) has redefined the landscape of professional skills development, especially in areas like accounting and finance, while shaping the next generation of managers. As automation, artificial intelligence (AI), and big data analytics continue to transform industries, educators

face ongoing challenges stemming from technological advancements and the evolving skill sets required for a digital workforce.

IR 4.0 has prompted significant questions about the role of humans in the workforce (Darmaji et al., 2019, as cited in Tavares et al., 2023). In response to these concerns, the Japanese government has initiated IR 5.0, known as the "human touch revolution" (Fukuyama, 2018). The focus of IR 5.0 lies in fostering collaboration between humans and machines. As noted by Tavares et al. (2023), this shift will demand competencies that extend "beyond specific curriculum subjects" (p. 07). This paper demonstrates that the future of education, particularly in preparing students for the workforce, hinges on adopting a connected approach.

Connectivism Theory

The connectivism theory informed this study. Connectivism is a learning theory for the digital age proposed by George Siemens (2005) and further explored by Stephen Downes (2019). It offers a framework that can tie together the diverse skill sets required in business education by fostering an integrated approach to learning soft, technical, and digital skills. Connectivism posits that learning occurs through the connections within networks, where knowledge is distributed across a network of connections, and learning consists of the ability to construct and traverse those networks (Downes, 2007, as cited in Duke et al., 2013). It emphasizes the importance of social and technological networks as conduits for learning and acknowledges the role of digital technologies in facilitating the creation and sharing of knowledge.

Connectivism emphasizes collaboration and network learning for the development of soft skills such as communication, teamwork, and critical thinking. Online forums and collaborative group projects create learning environments that mirror the complex, interconnected professional world. Utecht and Keller (2019) highlight how connectivism can be applied in educational settings to develop skills essential for the digital age, including critical thinking and decision-making. Utilizing digital tools and collaborative work projects in the classroom enhances technical proficiency, cultivates the soft skills necessary for effective collaboration and communication, and helps introduce students to digital tools.

Technical skills in business education are foundational to the profession. Connectivism's principle of leveraging digital tools and resources can be directly applied to the technical training of students. Platforms like online simulations, virtual labs, and digital repositories offer access to vast resources, enabling students to engage with real-world settings to address problems and solutions. As Kop and Hill (2008) discuss, connectivism acknowledges the role of technology in reshaping the learning landscape, suggesting that integrating digital tools in education reflects the changing technological landscape and the needs of learners. This pedagogical approach encourages students to actively seek out and apply technical knowledge, utilizing digital resources to enhance their skills.

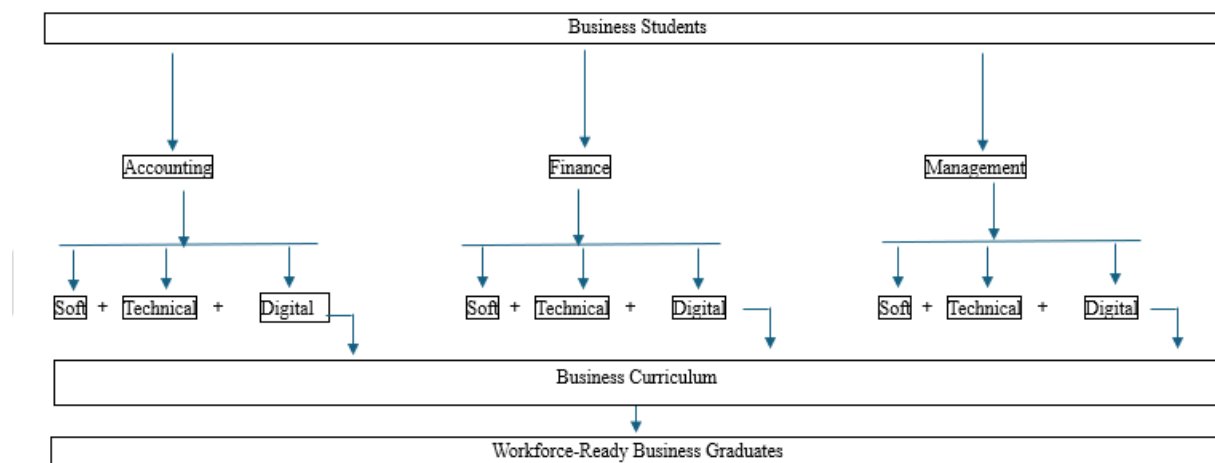
Digital skills, encompassing the ability to navigate, evaluate, and create information using digital technologies, are integral to finance, management, and accounting in the digital era. Connectivism inherently addresses acquiring digital skills by focusing on digital networks and technologies as essential learning elements. The theory's emphasis on the critical evaluation of information, pattern recognition, and the ability to transfer knowledge across contexts aligns with the requirements for digital literacy. By incorporating digital tools and platforms into the learning process, connectivism facilitates the development of digital competencies, preparing students to operate effectively in a digitalized environment. This research was informed by connectivism theory to answer the following two research questions:

RQ1: How do soft skills competencies impact business disciplines?

RQ2: What skills are essential for business graduates in the digital age, particularly in the era of AI?

The purpose of this paper is twofold. First, existing literature was reviewed to identify where and how soft skill competencies impact accounting, finance, and management. Then, the paper reveals the soft, technical, and digital skills that are essential for business school graduates in the digital age, especially as AI integrates itself into everyday business life. Compiling a list of skills by business disciplines will enable a new business curriculum to be developed. Figure 1 depicts the foundation for a modern business curriculum incorporating and assessing these various skills, providing additional credibility for business schools and, more importantly, creating workforce-ready graduates.

Figure 1: Skills for Workforce-Ready Business Graduates



ECONOMIC MOTIVATION

Defining and Measuring Soft Skills

Natural resources, labor, physical capital, and human capital are the main drivers of innovation and economic growth. Although the importance of technical skills is well understood as a component of human capital, the importance of soft skills has yet to be thoroughly vetted. In an effort to frame our understanding of how higher-order skills impact economic growth, Deming (2022) highlights four facts from previous literature in economics. The last of these specifically addresses soft skills. First, Deming illustrates that human capital explains much of the wage variation across countries. Second, investment in human capital creates high returns, especially early in life. Third, technological constraints are the main obstacle to increasing numeracy and literacy skills. And last, soft skills such as problem-solving, teamwork, patience, self-control, conscientiousness, and critical thinking have become more valuable over time. However, the means for developing such skills are still not completely understood. Difficulties arise when measuring these skills. Researchers rely on self-reported scores on a Likert scale more often than not.

In a study involving youth workers and their supervisors, Heller and Kessler (2022) compare supervisors' perceptions of young workers' soft skills to the supervisors' evaluation of young workers' job performance. The authors asked employers to rate their employees according to ten soft skill categories, including whether they were on time, completed work promptly, communicated effectively, and followed instructions. The authors also considered initiative, teamwork, trustworthiness, respect, personal responsibility, and the ability to absorb criticism. All were found to be significantly correlated with job performance ratings.

Finnie et al. (2018) reflect upon the challenges of post-secondary education as a means of helping workers develop workforce-ready information communication technology (ICT) skills. As ICT jobs evolve, the authors contend that soft skills like teamwork and communication will become increasingly complementary. Likewise, Mansoori and Lackéus (2020) find teamwork to be one of six methods or skills necessary for successful entrepreneurship. Although each of these studies and the others we discuss categorize soft skills a bit differently, there is significant commonality. This allows for systematic data collection as researchers continue studying soft skills' importance for future employment and economic development.

Finally, as researchers work to characterize the precise nature of soft skills, data on soft skills and their impact must become readily accessible. According to Lauder et al. (2018), although challenging, more data has been collected on soft skills in recent years. With the development of databases such as O*NET in the United States and the OECD's Program for the Assessment of Adult Competencies, we can better measure the impact of soft skills on productivity and wages.

Demand for Complementary Soft skills

Nordhaus (2021) cites Bostrom's (2006) coining of the term superintelligence to reflect the combination of skills people will need in the age of artificial intelligence. In addition to more sophisticated technical skills, workers will also need an evolving set of soft skills to be successful. Within the context of new product development, Trott et al. (2022) assert the importance of soft management tools such as coordination and communication, especially with large complex projects.

Deming and Kahn (2018) study variation in skill demands for professionals across firms and labor markets. The authors focus on keywords found in job advertisements. Using these keywords, they define ten specific skill categories; most of the categories describe soft skills. The categories include character (time management, organization, energy), cognitive skills (problem-solving, research ability), social skills (communication, teamwork), customer service (customer focus, patience), people management (leadership, mentoring), and project management. The authors then test the significance of each skill in determining advertised wages. They find that jobs requiring cognitive (technical) and noncognitive (soft) skills offer relatively higher wages. This further supports previous research illustrating that these skill sets are complementary.

Colombo et al. (2019) apply machine learning techniques to online job postings in Italy to determine the variety of skills in demand according to education, region, and experience level. Specifically, the authors wish to determine the relative importance of digital and soft skills in the labor market. Their approach starts with the ESCO classification system for European skills, competencies, qualifications, and occupations developed by the European Commission. They further divide digital skills into four subgroups: information brokerage skills, essential information and communication technology skills (ICT), applied management ICT skills, and ICT technical skills. The authors also specify four categories of soft skills: thinking skills, social interaction, application of knowledge, and attitudes and values. The authors conclude that soft skills are referred to more frequently in postings than digital skills across all occupations. However, demand for soft skills appears negatively related to the degree of automation within a particular occupation. The authors also find that digital and soft skills typically complement each other in professions that are not heavily dependent upon hard skills. In those occupations, digital skills are in higher demand.

Walker et al. (2018) state that attributes such as the ability to cooperate across teams, think strategically, regulate emotions, and navigate ambiguity are highly valued by employers. They also cite a report by the Business Council of Canada (2016) that found certain regions in Canada have a shortage of workers possessing technical expertise and soft skills. According to Anani (2018), about 75% of the highest-paying jobs in Canada are in information communication technology (ICT), business, and marketing. Demand is highest for workers with digital, business, and soft skills. Despite this, 55% of Canadian workers have no training or experience in ICT. These studies suggest that the development of soft skills is a primary concern.

Developing Soft Skills

Researchers have become more adept at characterizing and exploring the demand for soft skills in recent years. It follows that, as a society, we must become more deliberate about developing these skills in a manner that is both intentional and broad in scope. Several researchers are investigating how these skills are being developed today. Attanasio et al. (2020) find growing inequality in socio-emotional skills across two British cohorts born 30 years apart, using survey tools filled out by mothers (or, in some cases, teachers) about their children's behaviors. Each of these studies measures noncognitive skills using whatever measures are at hand rather than relating them conceptually to particular higher-order skills. The authors find that socioeconomic factors and marital status stunt noncognitive skills early on. These differences account for health and socioeconomic achievement differences later in life.

Marcenaro-Gutierrez et al. (2021) extensively reviews the literature concerning how soft skills development is influenced by gender and socioeconomic factors. Specifically, the authors evaluate the trade-offs between seven factors they believe are pathways for the development of noncognitive (soft) skills among students in Spain: sports, music, and art in general, relationships, street knowledge, manual skills, being sensitive, and being brave. These factors are compared with each student's evaluation of their own soft skills. Although some students emerge with a desirable mix of soft skills, in some cases, gender and other factors may enhance the development of some soft skills at the expense of others. For example, gender may influence one's chosen pathways and, thus, the specific soft skills that develop as a result.

Levin (2024) suggests that although training in ICT skills will continue to evolve with the demands of the economy, such training in the workplace may also help enhance soft skills through teamwork and collaboration on technical endeavors and challenges.

ROI for Soft Skill Development

As demand for workers with soft skills rises, it follows that workers who can productively apply these skills will enjoy a wage premium. Heckman and Kautz (2012) criticize reliance on achievement tests that do not adequately capture personality traits, goals, motivations, and preferences highly valued in school and most higher-paying occupations. The authors find that students who earn a graduate equivalency diploma (GED) after dropping out of high school earn no more than those who never completed high school or the GED. Also, after adjusting for cognitive ability, the authors find that traditional high school graduates earn significantly more than either dropouts or GED recipients over their lifetimes. The authors posit that poorly developed noncognitive (soft) skills appear to hinder high school performance and limit lifetime earnings. Equivalently, high school performance and lifetime earnings appear higher for those with more highly developed soft skills.

Carranza and McKenzie (2024) highlight that unemployment rates are relatively higher in developing nations despite relatively strong labor demand in agriculture. They suggest this is because, comparatively, more workers lack digital and business skills and soft skills such as critical thinking, creativity, reliance, and resilience. In Africa, specific soft skills training programs reduced turnover and increased pay for those who were already employed.

After reviewing postings for information technology jobs in Russia, Ternikov (2022) demonstrates that there is an evident salary premium for noncognitive (soft) skills. Although the results are mixed for those with limited work experience and uncertain technical expertise, inexperienced workers, senior specialists, and team leaders are expected to demonstrate significant soft skills.

The economic return to social skills in the United States more than doubled for a cohort of youth entering the labor market in the 2000s compared to the 1980s. In that study, Deming's (2017) social skills are measured by creating an index based on self-reported sociability, self-reported sociability at age six (as perceived by the adult researcher), and participation in high school clubs or sports. Although technology and trade have dampened the demand for labor in occupations that more intensively require cognitive (hard) skills, positions that require greater interpersonal skills have proved to be more resilient. Deming's findings suggest that an appropriate preschool curriculum focused on developing cooperative skills may generate long-term economic benefits.

Using administrative data from the compulsory military draft in Sweden, Edin et al. (2022) find similar returns to social skills as Deming (2017). The authors determine that for those with similar levels of education, the return to noncognitive (soft) skills was higher than the return to cognitive skills. Moreover, during that timeframe, the return to noncognitive (soft) skills approximately doubled, while the return to cognitive skills fell slightly. The authors also found that people with comparatively greater noncognitive (soft) skills tended to migrate toward better-paying jobs that rewarded those with a comparative advantage in noncognitive skills.

Osman and Speer (2025) demonstrate that soft skills and technical skills are complementary, and that training in both significantly raises income when compared to training in just one skill set or the other. Participants received 120 hours of training in either soft skills or technical skills; some received training in both areas. The soft skill modules included training in time management, interpersonal skills, customer service, email etiquette, and body language. In contrast, the technical skill modules provided information required to complete specific tasks. Training in technical skills, or in both soft and technical skills, had the most dramatic impact for entry level workers, increasing average income by 15% compared to those who only received soft-skill training. In subsequent years, however, workers who had training in both technical and soft skills increased income by over 20% compared to workers who received training in just one area or the other.

Evolving Job Requirements

Tyson and Zysman (2022) argue that artificial intelligence will replace many routine cognitive tasks over time. However, they also posit that AI will complement jobs that require higher-order cognitive skills, such as doctors and nurses. In these cases, AI will likely allow people in these positions to be more effective by freeing them from some of their more routine tasks. Similarly, Argrawal et al. (2019) state that a key determinant of whether a job is at risk of being replaced by artificial intelligence is whether the job necessitates the ability to make inferences or predict outcomes based on the information at hand.

Orrell and Veldran (2024) reflect on the potential impact of artificial intelligence on labor. They refer to a study by Frey and Osborne (2017) stating that approximately 47% of U.S. jobs were in danger of automation through the use of computers and artificial intelligence (p.265). Petropoulos (2018) and Bowles (2014) predict a similar fate for jobs in the EU. The authors describe a double helix of skill sets. One side consists of technical skills, while the other represents noncognitive or interpersonal skills essential for learning, performance, and realizing more advanced noncognitive skills.

According to Deming (2021), machines and automation eliminate jobs that require routine tasks and introduce labor uncertainty. He suggests that skills such as problem-solving, critical thinking, and adaptability enhance one's ability to make sound decisions on the job. Moreover, the author shows that wage growth in decision-intensive occupations is significantly higher after the age of thirty-five.

METHODOLOGY

The research design for this paper is a multidisciplinary literature review comprised of the following parameters. Data was gathered by researchers from Accounting, Finance, and Management and analyzed to address two research questions: (1) impact of soft skills competencies on each business discipline and (2) essential skills for undergraduate business majors in the digital age, particularly in the era of AI. The literature review spans the period 2014-2025 and involved searches using Google Scholar, ProQuest, EBSCOHOST, and JSTOR.

The keywords for the accounting discipline were “Accounting,” and “Soft Skills,” and “Digital Age” in the Google Scholar database. For the ProQuest, EBSCOhost, and JSTOR database searches, “Age” was removed from “Digital Age,” and “Soft Skills” was broken into separate words. Initially, the search produced 3,374 articles. The selection was refined by removing articles for the following reasons: accounting and soft skills were not in the title or abstract, no link to the full text, not accounting specific, inaccessible in English, and too narrow (focused on internships or just one skill). The final result was 64 articles. The accounting literature review also incorporates accounting competencies from professional bodies, specifically, the Institute of Management Accountants (IMA) and the American Institute of Certified Public Accountants (AICPA).

The keywords for the finance discipline were “Finance *,” and “Soft Skills,” and “Technical Skills,” and “Digital Skills” and produced less than 200 articles, of which very few were applicable. A more skill-specific search with “Finance **” produced 6,790 articles. Articles were evaluated for relevance by reviewing their abstracts. The selection was further refined to specifically address research questions focusing on “Finance Undergraduate Education,” “Soft Skills,” “Technical Skills,” “Digital Skills,” and “Finance Industry Needs.” Forty-one articles were selected. The article selection provided insight into the essential soft, technical, and digital skills required by undergraduate finance students entering the workforce in the 21st century. The seminal article mentioning soft skills in the finance industry was included. If an article contained any pertinent references, expanding beyond the timeframe would have been warranted.

The keywords for the management discipline were “Management,” “Soft Skills,” “Digital Skills,” and “Technical Skills.” Initially, the search produced 5,300 articles. The selection was refined by adding “Undergraduate Education” to “Management.” The final result was 95 articles.

As digital transformation swiftly alters the future workforce, it is essential to understand the technologies that drive this change. The next section sets the stage followed by the literature review consisting of two parts: Detailed Explanations of Digital Tools, Soft Skills Competencies Impact Business Disciplines, and Essential Soft, Technical, and Digital Skills for Accounting, Finance, and Management Disciplines.

SETTING THE STAGE

Detailed Explanations of Digital Tools

Digital Transformation Tools comprise a range of technologies and platforms designed to enhance and streamline business processes, improve efficiency, and promote innovation. Key components of these tools include cloud computing, data analytics, artificial intelligence (AI), and the Internet of Things (IoT). Cloud computing platforms, such as Amazon Web Services (AWS) and Microsoft Azure, provide a scalable and flexible infrastructure that allows businesses to efficiently store, manage, and process data. Data analytics tools like Microsoft Power BI and Tableau

enable organizations to analyze large datasets, extract insights, and make data-driven decisions that enhance business outcomes (Coelho & Martins, 2022). Artificial intelligence and machine learning tools, including IBM Watson and Google AI, assist companies in automating processes, improving customer experiences, and anticipating future business trends. The Internet of Things (IoT) connects devices and systems, allowing for real-time monitoring and control of operations. These digital transformation tools are vital for modern businesses to remain competitive and adapt to the rapidly evolving technological landscape. By harnessing these tools, organizations can enhance operational efficiency, elevate customer satisfaction, and drive innovation (Sigelman et al., 2022).

Digital Tools For Soft-Skill Development include various technologies and platforms to enhance interpersonal and emotional abilities. Examples are e-learning platforms, digital collaboration software, virtual simulations, and online training modules (Coelho & Martins, 2022). These resources provide realistic conversation simulations that help learners practice active listening, empathy, and emotional intelligence. Virtual reality (VR) applications allow users to develop public speaking skills by mimicking live audience interactions, while other apps support interview preparation by assisting with employer research, resume updates, and interview practice. This training is essential for building problem-solving and adaptability skills (Coelho & Martins, 2022; Haley-Robbins et al., 2019; Rajhans, 2012).

Digital Literacy Tools enhance individuals' proficiency in using digital devices and accessing information. These include e-learning platforms like Moodle and Coursera, which provide flexible access to course materials, and digital collaboration tools such as Microsoft Teams and Slack that facilitate teamwork and communication (Coelho & Martins, 2022; Khan et al., 2022).

Virtual Simulations and Online Training Modules offer immersive learning experiences replicating real-world scenarios, allowing users to practice skills in a controlled environment. These tools are crucial in contemporary education and professional development, making learning more engaging and accessible (Sigelman et al., 2022; Smith & Brown, 2023).

Online Learning Platforms deliver educational content, enabling learners to access courses remotely and acquire new skills or deepen knowledge. Examples include Coursera, LinkedIn Learning, and Udemy, which offer various subjects (Coelho & Martins, 2022). These platforms allow learners to study independently, balancing education with work and personal commitments. Many also feature interactive elements like quizzes and discussion forums that enhance engagement and often provide certificates, improving employability (Sigelman et al., 2022).

Digital-Age Tools significantly enhance the effectiveness of using digital devices and improve overall efficiency. These tools include various technologies and platforms to boost skill development and productivity. Examples of digital-age tools are e-learning platforms, digital collaboration tools, and virtual simulations (Smith & Brown, 2023). These resources provide flexible learning options and increase productivity within virtual environments. They also create safe spaces for skill development and task completion, ensuring users feel secure and protected (Coelho & Martins, 2022; Sigelman et al., 2022).

Digital Assessment Tools like quizzes and surveys monitor progress and offer feedback. These technologies are essential for fostering effective learning in contemporary education and professional development (Coelho & Martins, 2022; Sigelman et al., 2022). Online communication/collaboration platforms facilitate interaction and collaboration among individuals and teams, regardless of location (Rajhans, 2012). According to Coelho and Martins (2022), these platforms include instant messaging, video conferencing, file sharing, and real-time document collaboration, with options like Microsoft Teams, Slack, Zoom, and Google Meet. They enhance employee engagement by allowing team members to share thoughts and insights while promoting a culture of collaboration across time zones. Acting as centralized hubs for document sharing and task management, online communication platforms streamline workflows and boost productivity.

In summary, digital literacy tools are essential technologies that improve individuals' ability to use digital devices effectively to access, process, and protect information. Providing flexible access to digital tools and facilitating real-time communication make education and professional development more engaging and efficient for all key stakeholders (Coelho & Martins, 2022; Khan et al., 2022; Sigelman et al., 2022).

LITERATURE REVIEW

The first part of this literature review investigates the influence of essential soft skills on students' academic performance and professional development in accounting, finance, and management. The second part delineates the crucial competencies required in these three disciplines, explicitly highlighting the importance of soft, technical, and digital skills.

RQ1: Soft Skills Competencies Impact Business Disciplines

Research has consistently underscored the significance of soft skills for undergraduate business students, particularly as they navigate the complexities of an era characterized by rapid advancements in artificial intelligence (AI). Key competencies include critical thinking, emotional intelligence, adaptability, conflict management, communication, teamwork, problem-solving, leadership, negotiation, curiosity, and innovation. The scholarly exploration of these competencies reveals their vital roles in preparing students for the challenges of contemporary business environments.

Critical Thinking: Business students are empowered to engage deeply with complex information by developing critical thinking skills. This ability allows them to analyze and evaluate data systematically. Importantly, it helps them make well-informed and rational decisions while also enabling them to recognize cognitive biases, critically assess evidence, and identify logical inconsistencies. As students enhance their critical thinking capabilities, they become better equipped to navigate and tackle the intricate challenges of today's rapidly evolving business landscape (Sharma & Mehta, 2017).

Emotional Intelligence (EI): This skill helps students recognize and manage their emotions while empathizing with others. This skill promotes healthier relationships and effective teamwork. Students with high EI often become strong leaders, fostering trust and improving group cohesion and performance (Rivera Jr. & Lee, 2016).

Adaptability: Students with this skill are more flexible and open-minded in the face of change, especially during rapid technological advancements and changing consumer expectations. This ability allows them to pivot and innovate, ensuring their long-term career success and relevance in their fields (Weber et al., 2020).

Conflict Management: Effective workplace conflict management has become increasingly important due to factors like evolving return-to-office policies and the challenge of leading intergenerational teams. Solving these conflicts is essential for promoting collaboration and guiding agile teams (LinkedIn, 2025).

Communication Skills: Effective communication is vital for success in organizations. Students with strong verbal and written skills, along with active listening, are more likely to achieve their goals. Open dialogue and constructive feedback help build trust and understanding within teams, promoting inclusivity and participation. Being able to convey complex ideas is especially useful in collaborative settings (Absari, 2020).

Teamwork And Problem-Solving Skills: As workplaces become more interconnected, teamwork is essential for tackling complex issues. Students who develop these skills promote cooperation and accountability, making them more effective team members. By leveraging diverse perspectives, they enhance problem-solving and foster an environment that encourages innovation and growth (Ellikkal & Rajamohan, 2024).

Leadership Skills: Effective leadership begins with self-leadership, which entails inspiring and mobilizing individuals toward shared goals. By honing these vital soft skills, students can communicate with a clear vision that aligns their team's efforts with organizational objectives. In a global context, adapting leadership styles to diverse cultures is crucial for fostering inclusivity and maximizing team effectiveness (Issa & Hall, 2024).

Negotiation Skills: Proficient negotiation skills are indispensable for achieving mutually beneficial agreements. Students with this soft skill will be better prepared for adeptness in persuasion and acute listening skills to comprehend the needs and interests of opposing parties. Mastering negotiation tactics may enhance business relationships and significantly influence successful project outcomes (Jang et al., 2021; Richards et al., 2020).

Curiosity: Drives intellectual exploration and continuous learning, especially amid rapid technological change. By fostering a culture of curiosity, students enhance their creativity and adaptability, making this trait vital for future leaders and entrepreneurs (Orih et al., 2024).

Innovation: This skill is essential for generating new ideas and solutions in a changing business environment. Organizations that foster a culture of innovation encourage risk-taking and experimentation, enhancing creativity and creating an agile workforce that responds effectively to market changes, thus gaining a competitive edge (Karakose & Tülübaş, 2024).

RQ2: Essential Soft, Technical, and Digital Skills or Accounting, Finance, and Management Disciplines

Soft Skills for Accounting Students in the Era of AI

Accounting education has traditionally emphasized technical skills, with a strong focus on financial reporting, cost accounting, tax, auditing, and business law. (Peng et al., 2023). These technical skills have long been regarded as the core of accounting education, essential for anyone entering the field (Tsiligiris et al., 2021). The landscape of accounting is, however, undergoing change, particularly in the digital era marked by the Fourth Industrial Revolution (Schwab, 2017) and the start of the human-centric approach of the Fifth Industrial Revolution (Adel, 2022). Advisory and business services provided by accountants are growing at a much faster rate than traditional accounting services (Ma et al., 2021, as cited in Creel, et al., 2023).

Pernsteiner (2015), Robles (2012), and Weaver and Kulesza (2014) were among the voices more than a decade ago to underscore the importance of equipping new accounting graduates with strong analytical abilities, including expertise in data analysis and financial modeling. In response to the shifts in the role of accountants, there is a reinvigorated emphasis on the need to integrate soft skills in accounting education. As Saad (2025) notes, accounting graduates navigating in this AI-driven environment will require critical thinking and analysis skills, communication, creativity, innovation, agility, and adaptability. This pivot reflects a broader recognition by accounting professionals and professional organizations of the role soft skills play.

While soft skills are becoming increasingly vital in the digital workplace, research indicates that these skills are often undervalued and underdeveloped in accounting curricula. Asonitou (2022) highlights the challenges universities face in integrating soft skills into accounting programs, often due to the, traditionally, technical focus. Gunarathne et al. (2021) discuss the growing expectation-performance gap in soft skills among accounting graduates. They argue that while students are generally well-versed in technical competencies, they often lack the soft skills required by employers highlighting specifically communication skills (visual, oral and aural skills and the ability to communicate with different groups of people), problem solving and analytical skills, adaptability and flexibility, leadership and teamwork including the ability to work with people from different backgrounds.

This argument was supported in a study completed by Dolce et al. (2020) on accounting graduates and joint stock companies in Italy, finding a disconnect between graduates' self-assessments of their skills and employer expectations, particularly regarding teamwork, public speaking, and the ability to work in safety and security. For employers, the top ten soft skills in rank were (1) teamwork, (2) ability to work in safety and security, (3) public speaking, (4) objective guidance, (5) written and oral communication, (6) problem solving and decision-making, (7) adaptability, (8) time management, (9) resilience, and (10) proactivity. (Dolce et al., 2020, p. 68).

Creel et al. (2023) emphasized the importance of leadership, interview skills, teamwork skills, written and verbal communication skills, critical thinking skills, innovation, ethics, and ESG (Environmental, Social and Governance) in the context of accounting's transition from traditional to advisory services. Peng et al. (2023) further reinforce this by emphasizing the need for accounting graduates to possess both technology agility and soft skills, such as communication, teamwork, and leadership, to meet the demands of the modern accounting profession. Their study underscores that as accounting evolves toward more advisory and strategic roles, the combination of technological proficiency and soft skills will become critical for professional success.

Ghani et al. (2018) emphasize the expectations employers have for communication, teamwork, and leadership capabilities among new graduates. Deloitte Australia's 2019 report, as cited in O'Shea et al., (2022) underscored the human-centric future of work, and Tsiligiris et al. (2021) stress the rising importance of interpersonal skills, teamwork skills, communication skills, problem-solving skills and professionalism that includes the ability to adapt to a "firm's organizational culture." (Tsiligiris et al., 2021, p. 625). Similarly, Bryant (2019) emphasizes the necessity for accounting students to quickly learn and adapt to new technologies, highlighting the demand for problem-solving skills in unstructured environments.

Industry 4.0 has further necessitated the need for adaptability and interpersonal skills. Lansdell et al. (2020), identified “Industry 4.0 soft skills” essential for the modern accountant: complex problem-solving, critical thinking, creativity, people management, coordinating others, emotional intelligence, judgement and decision-making, service orientation, negotiation, and cognitive flexibility (p. 07).

As a way of adapting to the evolving demands of the accounting profession, professional organizations have identified essential skills in areas such as strategy, planning, leadership, and communication. These organizations recognize the importance of analytical and strategic thinking, leadership, and professional ethics and values alongside the traditional technical skills. The Institute of Management Accountants (IMA) created a competency framework for skills needed of today’s accountants (Bryant, 2019). At the center of the framework is professional ethics and values. Also included as a stand-alone component is leadership. The American Institute of Certified Public Accountants (AICPA) has developed a skills-based competencies framework for students entering the profession with three distinct components: accounting competencies, business competencies and professional competencies (AICPA, 2018, as cited in Aldamen et al., 2021). The AICPA defines professional competencies as skills, attitudes, and behaviors, and specifically identifies ethical conduct, decision-making, collaboration, leadership, communication, project management, and overall professional behavior. Soft skills for the accounting discipline are as follows:

- Communication (written, verbal/public speaking, and aural)
- Teamwork/Collaboration (including the ability to coordinate others)
- Leadership
- Adaptability
- Problem-Solving
- Analytical skills
- Strategic Thinking
- Critical Thinking
- Time Management
- Creativity
- Innovation
- Ethics
- Professionalism/Professional Behavior

Technical Skills for Accounting Students in the Era of AI

The need for technical foundations in accounting is well-documented. Accounting education has traditionally emphasized technical skills, with a strong focus on financial reporting, managerial accounting, auditing, and reg (taxation and business law) (Tiron-Tudor, 2023). In addition to the core four, Tiron-Tudor also notes corporate governance, risk assessment, internal controls, process improvement and performance management as key technical skills required for 4IR graduates. According to Tsiligiris et al., (2021), the shift in the accounting industry has expanded the need for technical skills to include consulting and business advisory, strategy, and technical ethical skills.

Rebele et al. (2019) explore the balance necessary between technical expertise and interpersonal skills in accounting education, questioning whether accounting faculty are in the best position to teach soft skills. Gunarathne et al. (2021), however, propose strategies in accounting education to close the gap between educational outcomes and industry needs by integrating both technical and non-technical skills.

The key competencies from the IMA continue to include traditional managerial skills such as risk management, decision-making, budgeting and performance, corporate finance, and strategic planning as part of the overarching strategy, planning, and performance competency. In addition, managerial accountants must have traditional business skills such as project and performance management.

The AICPA list of accounting technical competencies includes risk assessment analysis and management, measurement analysis and interpretation, reporting, research, system and process management and technology and tools. These competencies are tied to the traditional functions in accounting. In auditing, the framework supports professional skepticism, risk evaluation, and system controls; in financial accounting, it strengthens accurate measurement, interpretation, and clear reporting; and in tax, it emphasizes research, application of standards, and the use of technology to ensure compliance and effective decision-making.

In addition to the technical accounting competencies, the AICPA also notes business competencies needed for accounting professionals given the shifting industry. The business skills noted by the AICPA include strategic planning, implementation and management, business planning, and understanding of the legal and regulatory environment.

It is also important to note the CPA Exam requirements (Becker, 2025). Although the exam has changed with the CPA Evolution, the core functions remain. The CPA Exam covers three core sections: auditing and attestation, financial accounting and reporting, and taxation and regulation. Students are permitted to choose from business analysis & reporting, information systems and controls, and tax compliance and planning for the fourth section of the exam.

While technical competencies remain critical, particularly for those seeking CPA certification, they are increasingly being augmented by soft skills and digital tools that enhance efficiency and accuracy, highlighting the need for professionals to embrace the digital workforce. Alhawsawi (2019) examines the shift in required competencies due to the digital transformation and remote work environment. Duong et al. (2023) further highlight how traditional accounting skill sets must evolve to include analytical and strategic capabilities in the digital age. Technical Skills for the accounting discipline are as follows:

- Financial Accounting and Reporting
- Taxation and Regulation
- Auditing and Attestation
- Managerial Accounting
- Corporate Governance
- Risk assessment
- Internal Controls
- Process Improvement and Performance Management
- Accounting Software/Technology Tools
- Consulting
- Business Advisory
- Strategic Management
- Ethical Skills

Digital Skills for Accounting Students in the Era of AI

Digital skills are becoming indispensable as technology reshapes accounting functions. Schwab (2015) as cited in Muliati et al. (2024) emphasized that accountants must develop digital literacy to stay relevant in the industry. Digital skills include technological fluency and the ability to utilize emerging tools. Tiron-Tudor (2023) identifies some key digital competencies for accountants entering the digital workforce – IT skills and programming, analytical skills, basic digital skills, advanced data analysis, general computer skills, accounting information systems, artificial intelligence, robotic process automation, cloud-based computing, blockchain, database software, and technology design and programming.

Tsiligiris et al. (2021) break down digital skills into three sets (p. 633). Basic digital skills include core technologies already adopted, such as cloud, PowerBI, and the digitization of tax returns. Advanced skills include newer and more advanced technologies, such as AI and Blockchain. Programming also falls under the more advanced technologies, but with an important note that programming does not encompass advanced programming skills, but rather an understanding of the process. Finally, data skills include data management and data analysis.

Although focused on soft skills, Creel et al. (2023) recognize the need to incorporate data analytics and AI tools into the accounting classroom. Peng et al. (2023) further emphasize that artificial intelligence, robotic processing automation, blockchain, and machine learning are transforming how accountants work. A study by Bastos et al. (2024) underscores the increasing demand for digital skills in accounting education, emphasizing their crucial role in adapting to the 5th Industrial Revolution. Digitalization and AI require professionals to develop knowledge in Enterprise Resource Planning (ERP) systems, digital communication, data management, and cybersecurity.

The IMA and AICPA each have set forth components of their competency models that focus on technology and analytics. The IMA notes competencies in information systems, data governance and security, data analytics, and data visualization. The AICPA includes technology and tools as an accounting competency. The competency requires that accounting professionals be able to identify and use the technological tools necessary to analyze data, perform tasks

as assigned, and support the other competencies required for new professionals. Digital skills for the accounting discipline are as follows:

- Accounting Information Systems
- Cloud-Based Accounting Systems
- Power BI
- Artificial Intelligence & Machine Learning
- Design and Programming
- Blockchain
- Robotic Process Automation
- Big Data and Business Intelligence
- ERP Systems
- Cybersecurity

To conclude, as the accounting profession continues to evolve, accounting education must be forward-looking. The historical focus on CPA Exam content will no longer serve future accounting professionals. That does not mean those technical skills are unimportant; those skills remain key to producing future CPAs. Rather, a wholistic approach integrating soft skills, technical skills and digital skills is required. The digital age requires an accounting student profile that balances technical knowledge, digital fluency, and strong soft skills (Tiron-Tudor, 2023). The Muliati et al. (2024) study found that technical competency, soft skills, and digital literacy positively influence work readiness, emphasizing the need for accounting education to enhance these skills to prepare students for the workforce.

Soft Skills for Finance Students in the Era of AI

The first reference to soft skills in the finance industry appeared in the mid to late 90's. The words soft skills were in quotes and listed as communication and professionalism along with traits such as work ethic and ambition (Roshto, 1997). Academics began to study the topic at about the same time. A survey of finance professionals (CFOs and professors) uncovered various business topics as well as the following set of soft skills: communication skills, both written and oral, and working in teams (Hoover, 1996). Included in oral communication was the ability to explain financial data, likely produced by using computer skills, e.g., spreadsheets. However, there was no mention of any traits or competencies. By the turn of the century, an article appeared in the Careers section of Strategic Finance titled, "Skills for a New Millennium" (Messmer, 1999). Messmer stated that information technology (IT) would become the leading technical proficiency. He went on to share that due to the increase and speed of information creation, the delivery would need to be improved. Thus, he offered "people" skills, teamwork, negotiation, persuasiveness, and active listening as soft skills to hone. Soft skills also include knowledge sharing and emotional intelligence.

A decade later, Dixon (2010) shared that finance professionals have been lacking soft skills for many years. Soft skills added to the now burgeoning list are the ability to coordinate, work under pressure, and solve problems as well as decision-making capabilities, adaptability, continuous learning, emotional security, creativity, and service-minded. The list of specific soft skills competencies was growing.

In another study, Madden (2015) aptly surmised the necessary competencies for healthcare finance executives. Like many industries, the healthcare industry is ever-changing and expanding. While technical skills are assumed to be foundational, Madden suggested adding what he termed "soft-leadership skills." He expounded the following ten competencies: strategic orientation – having vision to navigate obstacles; agility – the ability to be flexible; courage and passion – disciplined risk taking, encourage innovation; ability to inspire – to motivate team members; ability to be influential – provide insightful recommendations in support of the organization's vision; ability to communicate – listen as well as speak, present information with patience; dependability – given today's digital age, use analytical tools and data, to ensure the accuracy of decision making and drive improvement; drive – resilience, determination, initiative; an integrative disposition – critical bridge builder; and engagement – connect with internal and external stakeholders.

Westfall (2023) asks what soft skills are. He goes on further to ask why they matter, especially given the advancement in artificial intelligence. As an example, Westfall reiterates one of the most common soft skills – communication – more specifically, learning to listen. The other skills he listed are presentation skills, resilience and adaptability, emotional intelligence (EQ), non-verbal communication/body language, observing role models/learning, and access accountability. He differentiates soft skills from hard skills; the latter being job-related technical knowledge and abilities. Westfall emphasizes that soft skills might be important for your job but, more importantly, they are mission-critical for your career. Furthermore, these skills cannot be outsourced to artificial intelligence. Westfall makes clear

that there is no generative AI that will have the responsibility of creating your potential. His final recommendation was to access soft skills that define your talents, your contributions to the world, and your humanity.

More recently, Fontinelle (2023) shared seven non-financial skills (i.e., soft skills) needed in finance. Many of these skills overlap with other disciplines, from communication skills to problem-solving, indicating their importance. The following is a list of essential soft skills needed for finance students before entering the dynamic 21st-century workforce.

- Communication Skills (written, oral, verbal, and non-verbal)
- Teamwork
- Negotiation
- Active Listening
- Creativity
- Critical Thinking
- Leadership
- Ethics
- Emotional Intelligence
- Problem-Solving
- Decision-Making
- Adaptability
- Continuous Learning
- Emotional Security
- Creativity
- Service-Minded
- Agility
- Courage
- Passion
- Resilience
- Intuition

Finally, soft skills, a combination of interpersonal and social skills, are needed to perform hard skills (also known as technical skills), such as technical or administrative procedures. Nielsen (2017) thought along both veins -- hard and soft skills. He acknowledged that there is a need to increase IT, mathematical, and statistical skills, but also specific soft skills such as intuition, creativity, and communication-specific information that originated from the analytics idea.

Technical Skills for Finance Students in the Era of AI

According to the research done by Nielson (2017), general technical skills include information technology (IT) as well as both general and advanced quantitative skills within statistics and economics. IT skills include business intelligence (BI), data mining, and basic programming, e.g., Python, R, or SAS. Quantitative skills include simple regression analysis to more advanced techniques such as discriminant analysis and structural equation modeling.

Bhimani and Willcocks (2014) discuss the dilemmas and possibilities of [digitization], software and processing power, and the accompanying data explosion for enterprises and their finance function. The authors develop a model for understanding data as well as information and knowledge relationships for companies. They point to both the potential of the complexities of Big Data, in relation to the finance function generally, and to the management accounting information provision specifically. Warren et al., (2015) also point out the importance of Big Data (the 4V's of Big Data—volume, velocity, variety, veracity) on management and financial accounting delivered by way of video, audio, and textual information made available via Big Data. The 4V's of Big Data are now being manifested in the digital world.

In addition to the aforementioned technical skills, Shoztic et al. (2016) indicated that professionals in Finance and Banking (F&B) will need the following technical and soft skills: data risk assessment, including data security and integrity; being able to work with relational and non-relational databases; applying and interpreting statistical methods and advanced analytics, turning raw data into usable information; and using visualization to present complex data analysis in a written narrative. These technical and soft skills will also be vital as the transformation of online banking platforms for personal financial management has risen considerably in the digital age (Wang, 2024). As noted by Anyfantaki (2024), the rise of internet banking in the digital economy has increased the availability to small

businesses, reducing their cost to do business and increasing convenience for their customers. The following list summarizes an array of technical skills needed for future finance professionals.

- Computer skills
- Excel
- Data Mining
- Basic Programming (Python, R, SAS)
- Regression Analysis
- Discriminant Analysis
- Structural Equation Modeling

Digital Skills for Finance Students in the Era of AI

Artificial intelligence (AI) functions similarly to the human brain, thinking and deciding more accurately by processing relevant data (Kaushik & Sharma, 2023; Xu et al., 2021). Marr (2020) notes that technical skills and data literacy are obviously important in this age of AI, big data, and automation. He also points out nine soft skills employees will need in the age of AI: creativity, analytical (critical) thinking [interacting in the workplace], emotional intelligence (machines cannot connect with humans), Interpersonal communication skills (using the right tone of voice and body language to interact with other people), active learning with a growth mindset (speed of skills ... will become outdated more quickly), judgment and decision making (information processing: computers vs. humans making the final, critical decisions), leadership skills (leading people to help them be their best self), diversity and cultural intelligence (diverse workforce needs to understand each other's perception of the world), and embracing change (agility, opportunity to grow). These are soft skills in areas that robots cannot do so well. Thus, as machines take on more of the easily automated aspects of work, the work of humans is going to become altogether more human.

As reported in the Financial Internet Quarterly, digital literacy showed up as a required skill in every financial specialization, sans venture capital and private equity (Costantino & Rodzinka, 2022). Artificial intelligence (AI) has functionality like the human brain, processing data to enhance the accuracy of the decision-making process. The use of artificial intelligence has contributed to less repetitive functions being handled by finance professionals, leaving room for analytical skills and problem-solving, enabling better communication. Having a team with people who can ask the right business questions, interrogate and model data to answer them, and then present the insights in a compelling way will pave the way to a digital transformation in finance.

It will become an increasing responsibility of management to support, encourage, develop, and incentivize their employees to adapt to AI. This includes training to develop employees' confidence in making the appropriate queries. Usable AI results will depend on the human skill sets such as soft skills (critical thinking and decision-making techniques) and technical skills (programming and statistical prowess). Correctly interpreting AI results will give employees the social intelligence needed to avoid mistakes while providing an additional layer of protection toward corporate governance. Additionally, Lawson (2019) suggests that using AI will enhance business performance and increase enterprise value.

As an example, dos Santos (2022) writes about the impact of digitization on business practices, noting that financial accounting processes are continuously improving with new technology. Reference is made to the Second Machine Age, noting the speed of data processing leading to reduced costs as well as improvements in accuracy, traceability, and decision-making. To that end, financial information needs to be accessible, with key metrics on dashboards, including some visual representation for quick reference. Soft and technical skills are needed to make progress using these newer information technologies, e.g., artificial intelligence and machine learning.

Wang (2023) examined job postings for the specific role of supervisory financial regulators. Management and teamwork skills are obvious skills for a supervisory position. Knowledge of both economics and finance, as well as up-to-date regulatory compliance, are also necessary. Soft skills include communication, judgment, decision-making ability, and analytical skills. Wang noted that there is a growing demand for data-related expertise in emerging technologies such as analytics, digital and technological proficiency, crypto assets, cybersecurity, and fintech. In addition, agility, innovation/creativity, and global perspective are included as new soft skills that are needed. While AI models are replacing entry-level work (data entry and report generation), higher-value strategic decision-making activities still need to be performed by humans. Wang concluded that additional research is needed regarding the impact of emerging technologies on the financial sector.

The use of distributed ledger technology (DLT), a particular type of blockchain technology, is increasing in the finance industry with the growing implementation of AI (Portovaras et al., 2024; Sokoli, 2023). Notable advantages to improving the overall financial system are increased speed, efficiency, and security as well as transparency in digital transactions, leading to enhanced trust (Chmeruk, 2020; Norsk et al., 2024; Portovaras et al., 2024). In addition, the authors noted that the use of blockchain tools may lead to a more sustainable and equitable global economy. Furthermore, incorporating AI into DLT will assist both regulators (in detecting fraudulent and illegal activity) and financial institutions (by improving the quality of data entry).

At the time of Sokoli's (2023) writing, it was determined that there was a significant research gap regarding the skills needed for successful finance professionals, given the impact of AI in the workplace. Included in the paper were statistics pertaining to automation in the finance industry. Hester (2023) of Nividous reported that 26% of an organization's automation, on average, falls under the finance umbrella and 80% of finance leaders have implemented or are planning to implement Robotic Process Automation. Furthermore, the potential benefits reported include: 20% of CEOs' time regained if financial tasks are automated and 10% of accounts payable processing time. Continued research will support improvements in the important financial functions such as customer service, asset management, sentiment analysis, and algorithmic trading (Saral et al., 2024).

Additionally, previous research supports that the finance sector is among the first and most extensive users of artificial intelligence (Patil et al., 2024). Furthermore, Glover et al. (2024) shared a report titled, *Generative AI: Prompting 101 for Finance*, along with their perspective that generative AI has the capability to transform functions of finance. Finance professionals analyze massive amounts of data to use in the decision-making process. Using artificial intelligence will improve the process immensely, both in efficiency and effectiveness. Mastering the art of prompt engineering (i.e., asking the right questions) is emerging as the newest skill set for these professionals. The combination of new and advancing digital skills with soft and technical skills will enable professionals to contribute to the sophistication needed in the finance industry. The following list delineates the key digital skills essential for the finance discipline.

- Artificial Intelligence
- Information Technology Skills
- Data Literacy
- Query-Capability
- Prompt Engineering
- Data Analysis
- Digital Literacy
- Crypto Assets
- Cybersecurity
- Fintech
- Blockchain

To conclude, it has become clear that there will be a need for a mixture of technical and soft skills in the finance industry. In their report on *Creating a Finance Leadership Pipeline for the Millennial Generation*, the Financial Executives Research Foundation (Seaver, 2016) espouses both technical and soft skills, including interpersonal skills as well as business literacy. The Foundation declared that there will also be a need for teams who have visionary skill sets combining technical and soft skills. More recently, Forbes Finance Council also shared 20 skills to cultivate if finance professionals want to stay relevant and be successful in serving their clients (Chitrathorn, 2023).

In addition, Cardon (2024) notes how managers are excited about AI, yet concerned that AI will replace people, dampen creativity and ingenuity, make their skills obsolete, and create a workplace that feels more machine-centric and less human. He predicts that AI integration will demand that workplaces become even more human-centered. His research suggests that in the AI age, employers expect to increasingly value "soft skills" that enhance human interactions and foster rich, people-centered company cultures. He states that as AI automates more tasks, workers will need to be able to communicate effectively with each other and with machines, i.e., ask the right questions. Cardon suggests that incorporating AI into the workplace will require careful oversight grounded in high moral values and interpersonal trust.

Deming's work (2017, 2021) mentioned above, was paralleled by Huitt's review of the Department of Labor Secretary's Commission on Achieving Necessary Skills (SCANS Report, Huitt, 1999). The report indicated the need

for additional competencies for 21st century American workers. He used words like cognitive, volitional, attitudinal, and behavioral. It was coined futuristic at the time and over the last quarter of a century, we have been harnessing massive amounts of data, processing the data at record speeds, and using creative software programs to present the data. We have begun to use artificial intelligence to improve most, if not all, of our basic work functions, including some soft skills. However, this new technology has yet to outdo human connectedness.

Soft Skills for Management Students in the Era of AI

In the age of artificial intelligence, soft skills have become increasingly important for undergraduate management students (Haidar, 2024; Rehan et al., 2025; Velásquez, 2024). Critical thinking, for example, is essential as it enables students to analyze and evaluate information, which helps them make informed decisions (Weber et al., 2013). This skill enhances problem-solving abilities and equips students to navigate complex business environments effectively.

Emotional intelligence is another vital skill. According to Rivera and Lee (2016), it allows students to recognize, manage, and express their emotions while interacting with others empathetically and judiciously. Research indicates that individuals with high emotional intelligence tend to excel in leadership roles, as they can forge deeper connections with their teams, fostering motivation and collaboration (Goleman, 1998). Adaptability is another essential soft skill for management students. Weber et al. (2020) highlight that adaptability is crucial, as it empowers students to adjust to new circumstances and effectively manage change. In an ever-evolving business landscape, pivoting and embracing novel ideas are essential for long-term success. A De Meuse et al. (2011) study emphasizes that adaptable leaders are often perceived as more effective in managing uncertainty.

Communication skills are crucial for conveying information clearly and efficiently (Ong, 2021). Effective communication involves articulating thoughts clearly and practicing active listening, which helps build trust and understanding within teams. According to Hackman and Johnson (2009), strong communicators enhance teamwork and collaboration among diverse groups. Additionally, teamwork and problem-solving skills are vital for effective collaboration and addressing complex issues (John, 2009; Weber et al., 2020). A study by Vyas (2019) emphasizes that business management students must possess strong communication skills to improve their employability. Similarly, research by Asefer and Abidin (2021) indicates that dynamic communication skills significantly contribute to graduate employability.

Leadership is a crucial skill for business management students to enhance their employability (Asefer & Abidin, 2021). By developing this skill, students can inspire and influence others toward common goals. Sousa and Rocha (2017) note that essential soft skills for workplace success include leadership, team management, and time management. Effective leadership involves clearly articulating goals and motivating others to achieve results. As Karimi and Pina (2021) emphasize, strong leadership starts with self-leadership. By honing this foundational skill, students prepare themselves for career advancement and team leadership in the job market.

Rao (2014) emphasizes the strong link between employability and soft skill development among management students. Soft skills are crucial in interviews, as they assess candidates' personalities and interpersonal effectiveness, often prioritized over academic qualifications. Developing these skills helps students adapt to workplace culture and contribute to organizational success (Asefer & Abidin, 2021). Recognizing the importance of interpersonal skills and teamwork, educational institutions are increasingly implementing programs to enhance soft skill development, preparing students for the evolving workforce demands. These factors underscore the essential role of soft skills in enhancing the employability of management students (Nusrat and Naz, 2018; Osmani et al., 2015; Pandey et al., 2022; Tripathy, 2020).

Negotiation has been and will be a required skill for future management graduates (McGinn & Salacuse, 2021; Richards et al., 2020). Choi and Yang (2024) suggest that negotiation skills are crucial for reaching mutually beneficial agreements through dialogue and compromise, ultimately driving organizational success. Mastering these techniques enhances relationships and leads to more favorable outcomes, fostering a harmonious environment within the organization. Fisher and Ury (2011) highlight the importance of focusing on interests and incentives rather than simply negotiating positions, as this approach can significantly improve organizational success and performance.

Innovation is crucial for business growth, with curiosity serving as a key soft skill. This trait encourages management students to continuously learn and fosters a lifelong growth mindset (Asefer & Abidin, 2021). Research highlights the strong link between curiosity, adaptability, innovation, leadership, and creativity, benefiting aspiring leaders and entrepreneurs (Orih et al., 2024; Sharma and Mehta, 2017; Weber et al., 2020). Organizations that cultivate a culture

of innovation empower employees to take risks, enhancing their competitive edge (Fuad et al., 2022; Martín-de Castro, 2013). Based on this review, several soft skills are deemed essential for management students as they prepare to enter the dynamic 21st-century workforce. These skills include:

- Critical Thinking
- Emotional Intelligence
- Adaptability
- Communication
- Problem-Solving
- Leadership
- Negotiation
- Collaboration
- Innovation
- Teamwork

Technical (Management) Skills for Management Students in the Era of AI

Management and leadership skills, including strategic planning, conflict management, ethical management, and organizational management, are crucial for undergraduate management students as they establish a foundation for effective team coordination and overall organizational success (Issa & Hall, 2024; Karakose, T., & Tülübas, 2024; Kouzes & Posner, 2024; Velásquez et al., 2024; Zhang et al., 2024). A solid understanding of human resource management equips students with the skills to navigate recruitment, training, and employee relations, all of which are essential for maintaining a productive workforce (Bratton, 2021). As we enter the digital age, Mazurchenko and Maršíková (2019) suggest students be proficient in digitally powered human resource management tools. Leadership is another essential skill for management students to master. Those who are proficient in leadership are able to effectively guide teams, motivate employees, and resolve conflicts, qualities that are vital for achieving organizational objectives (Robinson, 2022; Sharma & Mehta, 2017). By acquiring these skills, students not only enhance their ability to manage personnel but also prepare themselves to tackle complex challenges within organizations with confidence. Strategic skills are essential for modern business practices (Martinez & Thompson, 2019; White, 2023). According to Leyva et al. (2018), the significance of strategy in a competitive environment lies in developing management skills that allow individuals to navigate complex systems with limited information. These skills facilitate effective strategic planning in small and medium-sized enterprises (SMEs) by helping managers identify key actions needed to achieve organizational goals and improve competitiveness.

Moreover, strategic planning is more effective when individuals possess strong collaboration and negotiation skills (McGinn & Salacuse, 2021). These leadership, collaboration, and negotiation skills enhance one's ability to manage ethically. Additionally, ethical management skills enable students to understand and apply ethical principles in business contexts, fostering a culture of integrity and trust within their organizations (Sigurjonsson, 2015).

Haider et al. (2024) highlight that project management is a vital competency significantly bolstered by the soft skills previously discussed. This skill set is especially important for aspiring managers who seek to navigate the complexities of their roles effectively. As technology continues to evolve at a rapid pace, the ability to manage projects with confidence and precision will be increasingly indispensable for ensuring the successful execution of initiatives. Building robust project management skills not only enhances individual capabilities but also drives team and organizational success in an ever-changing landscape.

Additionally, Birou et al. (2022) and Pekkanen et al. (2020) emphasize that proficiency in supply chain and operations management will become increasingly necessary for future business graduates, particularly as organizations grow more global and engage with diverse stakeholders across various regions. Feola et al. (2024) suggest that developing entrepreneurial skills is becoming increasingly essential for the establishment of high-potential startups. At the same time, there is a growing need for educators to cultivate innovative and culturally competent public and private sector workers and managers who can effectively operate in a multicultural environment. Sharma and Mehta (2017) mention the importance of innovation education as part of the management discipline. By developing essential management (technical) skills, undergraduate students can greatly improve their employability and make valuable contributions to their careers and future organizations. Research suggests that future management students will need to acquire a diverse range of management (technical) skills, which include:

- Project Management
- Operations Management

- Strategic Planning
- Human Resource Management
- Supply Chain Management
- Organizational Management
- Conflict Management
- Ethical Management
- Innovation and Entrepreneurship

Digital Skills for Management Students in the Era of AI

According to Sousa and Rocha (2019), certain skills are required to create and manage emerging digital businesses that are considered ‘disruptive’ due to integrating the newest information technology. Future managers need specific digital skills to manage disruptions as they evolve and advance into a business. Digital literacy is an important skill for managers in disruptive digital business environments (Khan et al., 2022; Leonardi & Neeley, 2022; Mazurchenko & Maršíková, 2019; Sousa & Rocha, 2019). It is essential for managers to understand digital tools to be proficient in using digital technologies and platforms (Cantoni & Mangia, 2018; Manuti & de Palma, 2018). Digital literacy will be a necessity and not a luxury for future graduates to drive innovation and growth.

The technologies that are often highlighted include the Internet of Things, cloud technology, big data, mobile technologies, data analysis, artificial intelligence, and robotics. Artificial intelligence is increasingly recognized as a powerful tool for enhancing leadership capabilities and improving business outcomes (Haefner et al., 2021; Kolbjørnsrud et al., 2016).

Big Data, AI, and data analysis are important in data driven decision making (George, 2014; Sohu et al., 2024; Sousa & Rocha, 2019). Ultimately, the ability to harness big data for predictive, prescriptive, or descriptive analysis is essential for informed decision-making in management. By employing data analytics to anticipate trends, evaluate performance metrics, and optimize resource allocation, managers are empowered to make strategic decisions that foster business success in today’s data-driven environment. Cloud technology provides scalable and flexible solutions enabling resource management and organizational growth and operational efficiency (Khanagha et al., 2013; Srivastava et al., 2024).

Proficiency in digital tools allows individuals to navigate digital environments and effectively manage digital transformation (Cantoni & Mangia, 2018; Leonardi & Neeley, 2022; Manuti & de Palma, 2018; Mazurchenko & Maršíková, 2019; Sousa & Rocha, 2019). It is essential for them to adopt a continuous learning approach to stay current with the latest technological advancements and digital practices, as suggested by Sousa and Rocha (2019). Digital skills are crucial for managers to utilize technology effectively and drive business success in a rapidly evolving digital landscape. By embracing these digital skills, management students can thrive in an ever-changing technological environment. As we move further into the digital era of AI, the following key digital skills necessary for the management discipline:

- Digital Literacy
- Cloud Technology
- Data Analytics
- Artificial Intelligence
- Big Data

To summarize, developing essential soft, technical, and digital skills is increasingly crucial for management students as they prepare to navigate the complexities of an evolving labor market (Khan et al., 2022; Varenky & Piskova, 2024). By enhancing these vital competencies, students not only improve their employability (Sharma & Mehta, 2018) but also increase their productivity (Kouzes & Posner, 2024; Leonardi & Neeley, 2022; Robinson, 2022). A strategic emphasis on soft skills helps students become adaptable and resilient professionals, enabling them to excel in the dynamic landscape of modern business (Rehan, 2025; Velásquez, 2024; Weber & Gentry, 2011).

DISCUSSION

Accounting

The reviewed articles underscore the need to evaluate the content and design of current accounting curricula to prepare students for the digital workforce, the human-machine centric IR 5.0. (Fukuyama, 2018). Connectivism Theory offers a modern lens through which to view learning in the context of the internet and technology (Siemens, 2005).

Connectivism posits that learning occurs across a network of connections, and this theory is particularly applicable to the development of soft and technical skills in the digital age.

The assimilation of projects, work-integrated learning (WIL), into the classroom, as discussed by Freudenberg et al. (2011), exemplifies the application of connectivism principles, connecting classroom and career readiness. Larson et al. (2021) argue for the inclusion of information systems (IS) and analytics courses to supplement accounting education. This aligns with the approach posited by Connectivism by fostering networks of learning beyond the traditional core four of technical accounting. Educators can mimic real-world learning environments by developing technical and soft skills, by leveraging technology. For example, simulation software and virtual reality can be used to allow students to practice problem-solving and decision-making (Smith & Brown, 2023). AI can be incorporated into assignments requiring students to engage in prompt engineering.

Imagine an assignment where accounting students are placed in groups, asked to work with AI for a tax research project, verify the AI's responses with tax research software, and then present the findings to the class. In one project, students learn about teamwork, engage in prompt engineering, work with tax research software, and work on their verbal communication skills. IR 5.0 demands an accounting education that embraces the relationship between technical, soft, and digital skills, and the incorporation of techniques that align with Connectivism Theory's emphasis on collaborative and networked learning.

Finance

A skills gap exists between undergraduate finance students and employers who need new graduates to function effectively in the ever-evolving financial sector of the economy (Dixon, 2010; Gupta et al., 2024; Sokoli, 2023). A review of finance literature revealed the soft, technical, and digital skills finance undergraduate students need to be successful as they transition into their professional careers, particularly in a digital age characterized by rapid advances in AI.

Moreover, research suggests that positions in the finance industry are changing more rapidly than other positions (Patil et al., 2024). This is due to the increased use of technology, mainly artificial intelligence, and to consumer demand for more equitable, secure, and efficient online services (Anyfantaki, 2024; Biriuk, 2024). Compiling a list of contemporary and essential soft, technical, and digital skills for finance students and young professionals, within the context of a multi-disciplinary review of the literature, reveals the gaps that currently exist in the development of these skills.

In addition, providing a detailed list of soft, technical, and digital skills needed for finance students, as well as for students in accounting and management, will enable educators to create a more effective and comprehensive curriculum as the development of these skills becomes embedded into coursework.

Businesses need their new hires to hit the ground running as training is expensive in both dollars and time. A comprehensive curriculum that emphasizes contemporary skills-based coursework will help to close the skills gap by providing businesses with strong, workforce-ready finance graduates who help make businesses more efficient.

Management

The contemporary labor market is characterized by unprecedented levels of disruption occurring at an accelerated pace, as highlighted in the Boston Consulting Group report titled "Shifting Skills, Moving Targets, and Remaking the Workforce" (Sigelman et al., 2022). Notably, over one-third of the top 20 skills sought in job postings for average positions in the United States have changed since 2016, with job postings for these roles now requiring approximately one new skill for every four previously required.

In light of recent job disruptions, it is crucial for future management graduates to develop technical skills alongside strong digital competencies and soft skills. The key is to integrate all these skills together to build competencies. With the rapid emergence of new technologies, graduates must possess digital fluency and specific technical abilities. This combination will empower them to effectively leverage their skills.

Aspiring managers, entrepreneurs, and leaders should also cultivate a diverse skill set for success in their organizations. Proficiency in digital skills, particularly data analysis, is essential for translating raw data into actionable intelligence. Competence in data visualization and business intelligence tools, such as Microsoft Power BI

or Tableau, is increasingly important. Additionally, familiarity with artificial intelligence (AI) technologies, including generative AI tools, is necessary to enhance ideation and operational efficiency.

Fundamentally, soft skills such as critical thinking, problem-solving, innovation, ethics, and communication play a pivotal role in enabling graduates to critically assess generative AI and data visualization tools. These help managers to derive accurate conclusions from analytical data. Access to reliable and actionable information is crucial for informed decision-making in business, as the absence of accurate data can adversely affect organizational outcomes (Issa & Hall, 2024; Kouzes & Posner, 2024; Leonardi & Neeley, 2022; Tyson & Zysman, 2022; Williams & Garcia, 2021).

Consequently, it is essential that management undergraduate programs integrate the development of technical, digital, and soft skills throughout the educational experience. To accomplish this, educators must adopt a holistic approach to skill development in order to produce graduates who are adequately prepared for the demands of the evolving business landscape.

Mutual Soft Skills Among All Disciplines (Accounting, Finance, Management)

All of the skills from the three disciplines were entered into an Excel file and sorted first by specific skill and then by skill type (soft, technical, and digital). The data was further organized in Excel to find the commonalities between disciplines and specific skills. The findings from this data are depicted in Table 1.

Table 1: Common Skills by Discipline (Accounting, Finance, Management)

Soft Skills	Technical Skills	Digital Skills
<i>All three disciplines (Accounting, Finance, and Management)</i>		
Adaptability	Strategy	Artificial Intelligence
Problem-Solving		Data Analysis
Critical Thinking		
Leadership		
Teamwork		
Communication		
Ethics		
<i>Accounting and Finance</i>		
	Programming	Blockchain
		Cybersecurity
<i>Accounting and Management</i>		
		Cloud Computing
<i>Finance and Management</i>		
Negotiation		Digital Literacy
Emotional Intelligence		

The notable key takeaway from the above table highlights the commonality of soft, digital, and hard skills across three distinct business disciplines: accounting, finance, and management. In today's dynamic work environment, certain soft skills have become universally essential. These include adaptability, which enables professionals to navigate change effectively; problem-solving, which involves analyzing complex issues and developing innovative solutions; and critical thinking, which fosters informed decision-making. Additionally, leadership traits are crucial, as they inspire and guide teams towards common goals. Teamwork is indispensable in collaborative settings, where diverse perspectives drive creativity and improve outcomes. Strong communication skills are vital for conveying ideas clearly and fostering collaboration, while a solid understanding of ethics ensures that professionals act with integrity and social responsibility in their decision-making processes. Overall, these skills are not only valuable in their respective fields but also reinforce a well-rounded and versatile approach to professional success across various sectors.

LIMITATION AND FUTURE STUDY

Our study successfully identified the essential skills needed in the fields of management, accounting, and finance. The multidisciplinary literature review presented in this study has a limitation, however, as it does not include other business majors, such as Marketing and Management Information Systems. While this exclusion may narrow the research scope, it does not diminish the validity or significance of the findings. Instead, it presents an opportunity for future researchers in business to explore these areas and identify the essential soft, digital, and technical skills relevant to their specific disciplines. By incorporating these additional fields into the research, a more comprehensive understanding of the skills required across various business domains can be achieved.

This foundational work lays the groundwork for further exploration and comparison with other business majors. Future research can build on these findings, providing valuable insights that help bridge the skills gap in the broader business landscape. This ongoing inquiry will not only enhance academic knowledge but also inform educational programs and industry practices, ensuring that graduates are well-equipped to meet the evolving demands of the business world.

CONCLUSION

Sigelman et al. (2022) highlight significant trends in the demand for both digital and soft skills. Hernandez et al. (2024) discuss how rapid technological advancements, digitization, and automation are reshaping job requirements, revealing skills gaps. They recommend implementing targeted strategies and innovative learning models to address workforce skills deficiencies and ensure economic sustainability.

As the business landscape rapidly evolves, the need for business curricula to adapt is important as well. While technical expertise remains essential, it is increasingly important to recognize the other vital skills required in today's complex workplace. This multidisciplinary research aims to review the literature in accounting, finance, and management to identify the key competencies necessary for prospective business graduates entering the workforce in the 21st century. These key skills include technical, digital, and soft skills. According to Coelho and Martins (2022) and Sigelman et al. (2022), digital skills are expected to be in high demand in the future job market. Motivated by existing research in economics underscoring the positive impact soft skills can have on productivity and ROI, this study explores which soft skills contribute most significantly to business success.

The discrepancy between the abilities of employees and the expectations of employers constitutes a formidable challenge in the recruitment process, incurring costs exceeding \$150 billion annually for U.S. companies due to unfilled positions (Bell, 2022). Additionally, this skills gap often necessitates retraining initiatives that impose additional financial burdens on U.S. businesses, estimated to be over \$2 trillion (Singh, 2018). To address these inefficiencies, it is imperative that employees, employers, and academic institutions collaborate to close the skills gap. A synergistic pathway occurs when all stakeholders become adept in emerging technologies and commit to improving the transition from student to workforce-ready professionals.

As the accounting profession continues to evolve, it is critical that accounting education adopts a proactive paradigm. The traditional focus on CPA Exam content has proven insufficient for adequately preparing future accounting professionals. Although technical skills are indispensable for cultivating proficient CPAs, a holistic educational approach that amalgamates soft skills, technical skills, and digital competencies is vital. In today's digital milieu, accounting students must cultivate a profile that harmonizes technical knowledge, digital literacy, and robust interpersonal skills (Tiron-Tudor, 2023). A study by Muliati et al. (2024) highlighted the significant correlation between technical competency, soft skills, and digital literacy with regard to enhanced work readiness. This finding accentuates the pressing need for accounting education to fortify these competencies to effectively equip students for the workforce.

In the past decade, new terminology in the finance sector has garnered significant attention in popular discourse, encompassing concepts such as information technology infrastructure, software systems knowledge, data mining, and expertise in SEC reporting (Kermis & Kermis, 2020). This has been particularly evident in the development of digital payment systems during this time. Research conducted by Gupta et al. (2024) reveals a notable skills gap within what is projected to be the largest cohort of fintech talent. An analysis by da Costa (2021) indicates that new roles and competencies have emerged, largely driven by digitalization. Professionals are now mandated to possess not only competencies in accounting and finance but also expertise in information technology in order to maintain a competitive

edge. Portovaras et al. (2024) reinforce the notion that the burgeoning integration of technology across all business sectors necessitates continuous skill and knowledge updates to effectively harness new tools.

Varenky and Piskova (2024) recommend for future management students to master soft, digital, and technical skills. The findings of this literature review demonstrate that in the field of management, it is essential for future management graduates to cultivate both digital literacy and soft skill competency to enhance their employability. Management educators need to create opportunities for students to develop essential soft skills identified: leadership, adaptability, collaboration, empathy, effective communication, problem-solving, and along with digital competencies, particularly in areas such as AI literacy and data analysis.

As soft skills are increasingly valued in the job market and cannot be easily automated or replaced by AI, they play a pivotal role in a graduate's success. The ability to combine these competencies enables management graduates to work efficiently in teams, resolve conflicts constructively, accurately interpret reports, link data to informed decision-making, and understand and apply performance metrics—all of which are vital for navigating complex business environments. Aspiring management graduates should strive to leverage their soft, technical, and digital skills to differentiate themselves in a competitive job market, especially for entry-level positions. Demonstrating the capacity to create skills and value within organizations is paramount for achieving sustained career success. These skills (soft, digital, and technical) not only set individuals apart but are also essential for professional growth.

In conclusion, this multidisciplinary research delineates key essential skills comprising soft, technical, and digital competencies that will soon be required for the disciplines of accounting, finance, and management. Additionally, the study proposes a model that illustrates the processes necessary for future graduates to attain workforce readiness. While technical skills will remain a fundamental requirement, graduates must also develop digital literacy encompassing data analytics and AI literacy, as well as effective soft skill competencies to thrive in the evolving 21st-century workforce.

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Reframing Risk: Gender and Entrepreneurial Success in Business Education

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ABSTRACT

Entrepreneurship education frequently portrays women as more risk-averse than men, reinforcing stereotypes that shape course content, investment decisions, and student perceptions of entrepreneurial success. This study challenges those assumptions by examining the relationships among risk aversion, loss aversion, risk propensity, and venture performance across 157 entrepreneurs (93 female, 64 male). Using validated measures—including the DOSPERT scale for risk aversion ($\alpha = .943$) and the Risk Propensity Scale ($\alpha = .760$)—the findings revealed no significant gender differences in risk aversion, loss aversion, or overall risk propensity. Importantly, venture performance outcomes also did not differ by gender, but higher risk propensity was positively associated with growth intentions and perceived business success across all entrepreneurs. These results suggest that men and women approach risk more similarly than traditionally believed, reframing how business schools can design entrepreneurship education. The study's implications include developing curricula that move beyond gendered assumptions of risk-taking, emphasizing evidence-based decision-making, and equipping students with tools to assess risk strategically rather than stereotypically. By incorporating these insights into pedagogy, business educators can foster more inclusive and accurate representations of entrepreneurship, preparing students to navigate risk with confidence regardless of gender.

Keywords: Entrepreneurship Education, Gender and Risk, Risk Propensity, Business School Curriculum, Venture Performance

INTRODUCTION

Entrepreneurship is a cornerstone of business education, yet persistent gender disparities in entrepreneurial outcomes continue to shape how students, faculty, and practitioners understand success. For decades, research and classroom narratives have portrayed women entrepreneurs as inherently more risk-averse than their male counterparts, often suggesting that this trait explains differences in venture performance (Byrnes, Miller, & Schafer, 1999; Croson & Gneezy, 2009). These assumptions frequently make their way into textbooks, cases, and lectures, influencing how students think about entrepreneurial decision-making.

However, emerging evidence challenges these long-standing stereotypes. Studies indicate that gender differences in risk-taking are smaller than once believed and may even result from biased measurement tools that privilege “masculine” forms of risk (Eckel & Grossman, 2008; Nelson, 2015). When risk is reframed more broadly—including constructs such as loss aversion and risk propensity—patterns of similarity between male and female entrepreneurs become more visible (Dawson, 2023; Scarlata et al., 2024).

This study contributes to entrepreneurship education by providing empirical evidence that challenges gendered assumptions about risk orientation. Specifically, the article presents findings from a sample of 157 U.S. entrepreneurs examining the relationships among risk aversion, loss aversion, risk propensity, and venture performance across gender. Results showed no significant gender differences in risk aversion, loss aversion, or risk propensity, and venture performance outcomes were also comparable between male- and female-led ventures. Importantly, risk propensity—not gender—emerged as a key predictor of growth intentions and perceived success.

These findings carry direct implications for business schools. Entrepreneurship education should move beyond binary assumptions about gender and risk-taking and instead equip students with evidence-based frameworks for evaluating risk in diverse contexts. By doing so, educators can design more inclusive curricula, challenge stereotypes that undermine female entrepreneurs, and prepare all students to navigate entrepreneurial uncertainty with confidence and resilience.

LITERATURE REVIEW

Gender and Risk-Taking in Entrepreneurship

Research on gender and risk-taking has a long tradition, with early studies consistently suggesting that women are more risk-averse than men (Byrnes, Miller, & Schafer, 1999; Croson & Gneezy, 2009). This perspective has often been used to explain gender gaps in entrepreneurial entry, funding, and performance. Yet, more recent scholarship questions the robustness of these findings, arguing that differences may be overstated or context-dependent (Nelson,

2015). Eckel and Grossman (2008) emphasize that while men may take more risks in financial domains, women often display equal or greater tolerance in social or ethical risk contexts, underscoring the importance of measurement.

Prospect Theory and Loss Aversion

Prospect Theory (Kahneman & Tversky, 1979) provides a foundational lens for understanding entrepreneurial decision-making under uncertainty. Central to this theory is the concept of **loss aversion**, or the tendency to weigh losses more heavily than equivalent gains. Empirical studies reveal that entrepreneurs must regularly confront loss-framed scenarios, from opportunity costs to sunk investments. While loss aversion is often assumed to vary by gender, research findings are mixed. Some studies suggest women may display higher sensitivity to losses (Eckel & Grossman, 2008), while others find negligible differences (Dawson, 2023).

Risk Propensity and Venture Performance

Risk propensity, defined as a general willingness to engage in risky behavior, has emerged as a more consistent predictor of entrepreneurial outcomes than either risk aversion or loss aversion (Sitkin & Pablo, 1992). Entrepreneurs with higher risk propensity tend to pursue growth-oriented strategies, embrace innovation, and adapt to changing environments. McCarthy et al. (2017) found that risk propensity positively influences both opportunity recognition and venture growth. Importantly, studies increasingly show that risk propensity functions similarly across gender, suggesting that entrepreneurial performance outcomes are shaped more by individual orientation than by demographic categories (Scarлата et al., 2024).

Gender, Risk, and Stereotype Effects in Education

The persistence of gender-risk stereotypes has direct consequences for business education. Classroom narratives and case studies often present male entrepreneurs as bold risk-takers and women as cautious managers, subtly reinforcing stereotype threat (Steele, 1997). Research shows that exposure to these narratives can shape student attitudes toward their own entrepreneurial potential (Gupta, Turban, & Bhawe, 2008). As business schools seek to foster innovation and inclusivity, it becomes critical to challenge such assumptions with evidence that demonstrates the similarities—rather than differences—between male and female entrepreneurs.

Gaps in the Literature

While the literature establishes risk as central to entrepreneurship, significant gaps remain. First, much of the early research relied on laboratory tasks that may not accurately capture entrepreneurial decision-making (Croson & Gneezy, 2009). Second, gender differences have often been reported without considering constructs such as loss aversion or risk propensity that provide more nuanced insights. Finally, the educational implications of these findings—particularly how gendered narratives of risk-taking shape entrepreneurship pedagogy—remain underexplored.

METHODS

This study investigated the relationships among risk aversion, loss aversion, risk propensity, and venture performance with a focus on gender comparisons. The sample included 157 entrepreneurs, of whom 93 were female and 64 were male, representing a wide range of industries such as services, retail, technology, and manufacturing. Participants were recruited through entrepreneurial networks, professional organizations, and small business associations to provide a diverse cross-section of entrepreneurial experiences.

A quantitative survey design was employed to test whether common assumptions about gender differences in risk-taking behaviors hold true among practicing entrepreneurs, and to evaluate the extent to which risk orientations influence business outcomes. The survey incorporated several validated instruments to ensure measurement reliability. Risk aversion was assessed using the Domain-Specific Risk-Taking Scale (DOSPERT), which captures attitudes toward risk across multiple domains and demonstrated strong internal consistency ($\alpha = .943$). Risk propensity was measured with the Risk Propensity Scale (RPS), a five-item instrument widely used in management and entrepreneurship research ($\alpha = .760$). Loss aversion was evaluated using an adapted Loss Aversion Measurement (LAM) scale that presented respondents with a series of paired gain–loss choices in which the potential loss increased across items while the gain remained fixed; the point at which a respondent switched from accepting to rejecting the gamble provided an estimate of individual loss aversion. Finally, venture performance was assessed using self-reported indicators, including growth intentions, revenue stability, and perceived business success.

Data were analyzed using independent-sample t-tests to compare male and female entrepreneurs on measures of risk aversion, loss aversion, and risk propensity. Multiple regression analysis was then conducted to test the predictive power of these risk constructs on venture performance outcomes. Reliability analyses confirmed strong internal

consistency for each of the scales used in the study.

All participants were informed of the study's purpose, and participation was voluntary. Data were collected anonymously to ensure confidentiality. The research was conducted in compliance with institutional ethical standards for human subjects research.

RESULTS

The analysis revealed several important findings that challenge conventional assumptions about gender and entrepreneurial risk-taking. First, no statistically significant differences were observed between male and female entrepreneurs in levels of risk aversion, loss aversion, or risk propensity. These results suggest that the long-standing narrative portraying women as more risk-averse than men does not hold true within this sample of practicing entrepreneurs. Both men and women demonstrated similar approaches to evaluating risk and responding to potential losses.

Second, venture performance outcomes did not differ significantly by gender. Female and male entrepreneurs reported comparable levels of revenue stability, perceived success, and growth intentions. This finding is particularly notable given the persistent stereotype that women's ventures underperform relative to those led by men. The absence of gender-based performance differences reinforces the need to reexamine the ways in which entrepreneurial outcomes are taught and discussed in the classroom.

Finally, risk propensity emerged as the most consistent predictor of venture success. Entrepreneurs with higher levels of risk propensity were more likely to report intentions to expand their ventures and to evaluate their businesses as successful. This relationship held true across gender, highlighting that willingness to engage with uncertainty plays a central role in entrepreneurial growth and perception of achievement. In contrast, neither risk aversion nor loss aversion demonstrated a significant predictive relationship with performance outcomes.

Together, these results emphasize that entrepreneurial success cannot be explained by gender differences in risk orientation. Instead, they underscore the importance of understanding risk propensity as a key factor in venture development and challenge educators to reconsider the narratives presented in business school curricula.

DISCUSSION

The findings of this study challenge some of the most persistent assumptions about gender and entrepreneurship. For decades, the dominant narrative in both scholarly research and classroom teaching has been that women are inherently more risk-averse than men, which has been used to explain disparities in business entry, funding, and performance (Byrnes, Miller, & Schafer, 1999; Croson & Gneezy, 2009). Yet, the results presented here provide strong evidence that male and female entrepreneurs approach risk in remarkably similar ways. No significant differences were observed in risk aversion, loss aversion, or risk propensity, and venture performance outcomes were also equivalent across gender.

These findings are consistent with more recent studies suggesting that gender differences in risk-taking may be overstated or influenced by the way risk is measured (Eckel & Grossman, 2008; Nelson, 2015). By using validated scales such as DOSPERT and the Risk Propensity Scale, this study provides further evidence that the supposed gap between men and women in entrepreneurial risk-taking may be more perception than reality.

The results also highlight the importance of risk propensity as a predictor of entrepreneurial outcomes. Entrepreneurs who exhibited higher levels of risk propensity—regardless of gender—were more likely to report growth intentions and perceive their ventures as successful. This aligns with research demonstrating that risk propensity plays a central role in entrepreneurial decision-making and opportunity pursuit (Sitkin & Pablo, 1992; McCarthy et al., 2017). In contrast, risk aversion and loss aversion did not significantly predict performance, suggesting that generalized fears of loss may be less influential than an individual's orientation toward opportunity and action.

Taken together, these findings suggest a need to reconsider the role of gender in discussions of entrepreneurial success. While structural barriers such as access to capital and networks remain important, gendered assumptions about risk may serve to reinforce stereotypes that are not supported by empirical evidence. If business schools continue to perpetuate narratives that women are less willing to take risks, they may inadvertently limit students' confidence and entrepreneurial aspirations. Conversely, when curricula reflect the reality that men and women demonstrate similar approaches to risk, students are better equipped to view entrepreneurship as an inclusive domain defined by strategy, resilience, and informed decision-making rather than by gendered traits.

IMPLICATIONS FOR TEACHING AND LEARNING

The results of this study hold several important implications for entrepreneurship education and, more broadly, for business school curricula.

First, instructors should reconsider the way gender and risk are framed in the classroom. Textbooks and case studies frequently portray male entrepreneurs as bold and risk-seeking while depicting women as cautious or reluctant to take chances. These narratives reinforce stereotype threat (Steele, 1997) and may discourage students—especially women—from fully identifying with the entrepreneurial role. Integrating empirical evidence that men and women demonstrate similar levels of risk aversion and loss aversion can help dismantle these stereotypes. By presenting risk-taking as a human characteristic rather than a gendered trait, faculty create a more inclusive learning environment.

Second, curriculum design should place greater emphasis on risk propensity as a driver of entrepreneurial outcomes. The findings of this study suggest that a willingness to engage with uncertainty, rather than avoidance of risk, is most closely tied to growth intentions and perceptions of success. Classroom activities that encourage students to reflect on their own orientations toward uncertainty—such as scenario-based decision-making exercises, role-playing entrepreneurial choices, or simulations of gain-loss tradeoffs—can help them develop a more nuanced understanding of risk.

Third, teaching strategies should highlight the strategic management of risk rather than equating risk with recklessness. Instructors might incorporate decision-making frameworks rooted in Prospect Theory (Kahneman & Tversky, 1979) or risk management tools used in practice. By emphasizing evidence-based approaches to evaluating and mitigating risk, business schools can equip students with the skills to act decisively without reinforcing outdated gender norms.

Finally, educators have an opportunity to foster critical thinking about how cultural narratives influence perceptions of entrepreneurship. Encouraging students to question why women are often described as “risk-averse” and to examine empirical findings that contradict this assumption can deepen their understanding of bias in business contexts. This reflection not only improves classroom inclusivity but also prepares students to challenge bias in professional environments, whether as entrepreneurs, investors, or leaders.

CONCLUSION

Entrepreneurship education is most effective when it reflects the realities of entrepreneurial practice rather than the persistence of stereotypes. This study demonstrates that male and female entrepreneurs are far more similar than different in their levels of risk aversion, loss aversion, and risk propensity, and that venture performance outcomes do not differ by gender. What does matter is risk propensity, which consistently predicts growth intentions and perceived success regardless of gender.

For business schools, these findings represent an opportunity to reshape how risk and gender are presented in entrepreneurship curricula. Moving away from outdated narratives and toward evidence-based instruction allows educators to foster inclusive classrooms, challenge stereotypes, and empower all students to see themselves as potential entrepreneurs. By teaching risk as a strategic and learnable competency rather than as a gendered trait, business schools can better prepare graduates to navigate uncertainty, pursue opportunities, and lead ventures with confidence.

Ultimately, reframing risk in entrepreneurship education is not only about correcting misconceptions—it is about expanding access to entrepreneurial identity and success for all students. In doing so, business schools advance their mission to innovate teaching and learning while preparing the next generation of entrepreneurs to thrive in a diverse and uncertain business environment.

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Project How to Be Awesome: Building Goal Setting Skills and Motivation in Undergraduate Business Students

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ABSTRACT

Developing students' goal setting skills is essential, yet often difficult to emphasize in a typical undergraduate business curriculum. The following classroom experience documents our college's attempt to prioritize goal setting and individual motivation in an introductory business course through a semester-long assignment titled "Project How to Be Awesome." The experience provides students with opportunities to practice goal setting, integrate feedback, and establish a plan for directing future effort and investment. Initiatives such as this have strong potential to improve student retention, persistence, and overall outcomes.

Keywords: Goal setting, Motivation, Class Material

INTRODUCTION

Higher education is facing unprecedented headwinds. Attitudes toward US higher education have declined, especially in the last five years (Pew Research Center, 2024), punctuated by a stark decrease in trust (Brady & Kent, 2022; Taylor et al., 2020; Johnson & Peifer, 2017). Student loan debt has exploded, more than tripling between 2006 and 2023 (CFR.org Editors, 2024). Over half of those finishing college graduate with debt, and the average debt level is nearly \$30,000 (Hahn, 2024). Though the returns to college education remain substantial and growing, their rate of growth has slowed significantly (James, 2012). Taken together, the emergent view is that a college degree is no longer a riskless investment. Although there are many ways business education can improve (Emiliani, 2004), professors can help students reduce the riskiness of their college investment by cultivating identity-based motivation (Oyserman, 2007) and utilizing assignments that connect learning experiences to career outcomes (Wickam, 2023). Furthermore, recent research has demonstrated the efficacy of self-management skills for developing college students' motivation (Gerhardt, 2007).

During a recent strategic planning process, our institution engaged with alumni, employers, and community leaders to understand where our students were meeting employers' expectations and where they were not. A consistent theme emerged – though our graduates demonstrated strong technical skills, their motivation and initiative were underdeveloped. Further, our students were not goal-oriented and lacked motivation. Through this discovery process, we also learned that our introductory business course was not engaging, nor did it offer students guidance on how to approach the college experience. These two realizations presented an opportunity to reimagine our Introduction to Business course.

Central to this effort was a commitment to help students develop and document goals and then formulate a plan for using their college experience to help them achieve those goals. Employers rightly believe that goal setting has value (Locke et al., 1981; Locke & Latham, 2006; Latham et al., 2011). Goal setting exercises have been shown to increase academic performance in college students (Morisano et al., 2010) and can have a positive effect on motivation (Travers et al., 2015). Setting goals is even likely to increase well-being and happiness (Sheldon & Elliot, 1999). With these potential benefits in mind, we follow a methodology similar to that used by Crews & Stitt-Gohdes (2013) to develop a four-part class project called "Project How to Be Awesome" to serve as a central theme of our Introduction to Business course. This project leads students through a process of self-assessment, goal setting, and action planning. The Introduction to Business course is required for all undergraduate business majors. The course is also designated as part of the university's general education program and counts toward the required credits in social sciences. As a result, the course fields a wide variety of students, primarily first-year students, mostly business majors.

In this paper, we introduce "Project How to be Awesome" as our response to the need for goal setting training early in business education. The project helps students normalize the goal setting process and practice self-improvement via goal setting training. This result is a direct continuation of the goal setting literature. Our findings present another

example of how goal setting can be taught in a formal environment with undergraduate students, contributing to positive student outcomes. We discuss best practices for implementing the project related to grading, timing, and lessons learned. We provide templates and grading rubrics. Our study contributes to general pedagogy literature by providing another example of soft skills education for business students.

THEORETICAL FOUNDATION

Students who master technical knowledge still require soft skills to be successful (Baldwin et al., 2011). Two such soft skills, goal setting and self-motivation, are key to success in managing professional relationships (Robles, 2012). Setting goals is strongly associated with self-efficacy and motivation, persistence, and a sense of responsibility (Locke & Latham, 2002). It is well documented that motivation and goal setting interact to impact individuals' efforts and outcomes (Bryan & Locke, 1967; Zimmerman, 1989; Cheng et al., 2020). This relationship extends to students' efforts to self-regulate their own learning and improve their own outcomes (Zimmerman, 2008). Furthermore, motivation can increase performance (Garg & Rastogi, 2006; Ganta, 2014), satisfaction (Tietjen & Myers, 1998; Bassam Mahmoud & Reisel, 2014), and even team coordination (Gagné et al., 2015). What motivates individuals in the workplace, however, can vary by age (Rožman et al., 2017) or generation (Kultalahti & Viitala, 2014; Mahmoud et al., 2021), highlighting the importance of connecting motivation to academic and career outcomes during the collegiate experience.

Goals are effective in building motivation because they help direct attention and actions, resulting in improved performance and outcomes (Rothkopf & Billington, 1979). Foundational research from cognitive psychology emphasizes that goals help teach “how to think” rather than “what to think” (Meichenbaum, 1977). We see the importance of this internalization clearly in goal setting as individuals need to have a minimum level of commitment to the goal before it begins to affect performance (Erez and Zidon, 1984; Hollenbeck et al., 1989).

The benefits of setting goals are well documented and based on several factors, including goal specificity, goal purpose, competition, participation in decision-making, and incentives (Locke et al., 1981; Locke, 1982; Locke & Latham, 2002; Latham et al., 2011; Lunenburg, 2011). There are many ways in which people learn how to set goals. Prominent approaches involve the use of “if-then” statements (Gollwitzer, 1999), visualization exercises such as Oettingen's (2014) WOOP (i.e., Wish, Outcome, Obstacle, Plan) method, and structured processes of self-reflection on personal goals (Morisano et al., 2010). More recently, gamification of goal setting exercises has been shown to improve motivation and performance (Buckley & Doyle, 2014; Growning & Binnewies, 2019).

Different goal orientations can motivate different actions. Notably, performance orientation (i.e., focus on demonstrating competence relative to others and on outcomes rather than the learning process) might only motivate ‘working hard’ while mastery orientation (i.e., focus on developing personal competence by learning and mastering new skills and prioritizing improvement) can motivate both ‘working smart’ and ‘working hard’ (Sujan et al., 1994). Goal orientation and motivation are also critical for other behaviors that benefit students, like seeking feedback (Bok et al., 2013; Bing-You et al., 2018). Supervisory feedback can also influence and improve individual goal orientation (Sujan et al., 1994). While motivation is a complex topic with many determinants (Bandhu, 2024), by fostering some aspects of motivation faculty can help students develop the capacity to seek constructive feedback (Bok et al., 2013; Bing-You et al., 2018; Leenknecht & Carless, 2023), as well as motivate “working smart” and “working hard” (Sujan et al., 1994). With “Project How to Be Awesome,” we offer students an opportunity to practice goal setting and develop motivation early in their education.

LEARNING OBJECTIVES

Project How to Be Awesome is the central assignment of the course and has three primary learning objectives. Specifically, after completing the project students will be able to:

- Take responsibility for and motivate their own learning and development,
- Develop goal setting skills to enhance this responsibility,
- Direct attention and action toward specific goals.

Although the concept of goals is not new to most students, in our experience, prior to encountering this assignment few students had training in how to design specific, individual goals that can inform their approach to education and personal development. Simply learning the mechanics of goal setting might not be an innovation in the classroom. However, we posit that Project How to be Awesome offers an innovative frame by creating the opportunity for students

to self-assess, develop personal goals, and marshal their effort and resources thoughtfully to achieve those goals.

PROJECT INSTRUCTIONS

The project consists of four deliverables (see Appendix A) due in succession throughout the semester. Deliverable 1 is a self-oriented SWOT analysis. Students document their strengths, weaknesses, opportunities, and threats in bullet form. They are instructed to think of strengths and weaknesses as factors internal to themselves and opportunities and threats as external factors. Students are encouraged to take time to introspect and ask people who know them well to contribute insights.

Deliverable 2 is a formal goal setting exercise. Students formulate at least three goals for each of five different time horizons. These time horizons include short-term (i.e., end of the week), end-of-semester, year-end, long-term academic, and lifetime. They are instructed to make their goals as specific and time bound as possible. The SMART goal framework is discussed during this instruction session, and examples are given (see Appendix B for examples).

Deliverable 3 is a gap analysis. Using an Excel template, students identify their highest priority goal for each of the time horizons. The students next identify skills and capabilities needed to achieve each goal. For example, a student with a post-graduation goal of gaining acceptance to a prestigious law school might identify writing skills as required. Next, students rate the importance of each skill or capability in achieving the goal on a 1 to 10 scale (1 being unimportant and 10 being very important). They then rate their current level of proficiency based on their skill or capability. Continuing with our law school example, a student would likely realize the importance of writing skills to gain admission to law school and rate the importance of writing skills at 10. Their self-score on writing skills would presumably be lower, perhaps a 6. This example analysis thus yields a gap of -4 in writing skills, indicating an area to work on. Students go through this process for each required skill or capability for each of their top priority goals.

Finally, in Deliverable 4, students construct a plan to close gaps identified in Deliverable 3. They are instructed to research the resources and methods to address each gap. By laying out a plan of action, they are finding ways in which directed effort will improve performance, which is a pathway to increased motivation. Students are given a general template and encouraged to offer introductory and conclusive comments.

LOGISTICS AND STEP-BY-STEP INSTRUCTIONS

We provide the students with the templates for each deliverable (see Appendix A) on our learning management system (LMS). Over years of assigning this project, we suggest dates for publishing the templates and making the deliverables due in Table 1.

Table 1: Recommended Deliverable Due Dates (based on a 16-week semester)

Deliverable	Publish on the LMS	Due Date
1: SWOT analysis	Beginning of Week 4	End of Week 5
2: Setting goals with time horizons	Beginning of Week 6	End of Week 8
3: Gap analysis	Beginning of Week 9	End of Week 11
4: Action plan	Beginning of Week 12	End of Week 15

The primary challenge in implementing the project is driving student engagement. Given the nature of the exercise, there are pathways for students to receive good grades with little effort. In order to accomplish the learning objectives, students must engage in significant introspection, self-assessment, and future-oriented thinking. Freeing up class time to work on the project and engaging with students directly on their work has been helpful.

Over the past few years of the project, we learned that outlining each deliverable roughly ten days before it is due leads to better outcomes. Student engagement is higher when the instructor clearly communicates the importance and expectations. Outlining each deliverable, its expectations, and importance early, encourages students to prioritize the project and allows the instructor to offer frequent reminders and answer questions up to the due date.

Additionally, we found that quick grading turnaround is critical to successful implementation. Since students use the provided template, grading is efficient and can be done relatively quickly. This project can be graded by teaching assistants using standardized rubrics (see Appendix C). The instructor trains the teaching assistant by grading a random sample of ten submissions together during a brief meeting. Once trained, a teaching assistant can grade an average submission in five to ten minutes.

ASSESSMENT OF PROJECT EFFECTIVENESS

At the conclusion of the project, we asked students to summarize what they had learned through the process. Each student was asked to submit an informal assessment comprising four discussion questions. Students were asked to self-reflect on the following four items: 1) what they learned through the process; 2) whether the project changed their approach to their studies; 3) whether the project changed their view of themselves and/or their future; and 4) if the project confirmed things the students already knew. The sample consisted of students in the Fall semester in the Introduction to Business class. The average age of the student is 19.6, with 50.9% of the respondents identifying as male, 44.5% as female, and 4.6% as non-binary, n/a, or trans. Freshmen comprised most of the sample at 74.5%, 14.5% were sophomores, and the remaining percentages were juniors and seniors.

Student feedback was overwhelmingly positive. Of the 89 responses there were no responses having any negative connotation, one response was neutral (e.g., “I wouldn’t say that it really changes anything for me except it kind of scares me”), and 88 responses showed positive connotations to the project’s effectiveness.

The learning objectives of the project are to 1) enhance students’ sense of responsibility for their own learning and development, 2) develop goal setting skills to enhance this responsibility, and 3) learn to direct attention and action toward specific goals. Student comments can be tied directly to these learning objectives, including “[The project] has also confirmed the things that I need to work on and has given me a more responsible mindset when it comes to bettering myself”, and “This process has confirmed that I want to do a lot in life and if I hold myself accountable, I can achieve and complete my goals.” Other quotes that meet learning objectives include, “Identifying the gaps within my skills has given me insight into where I need to focus more to reach my goals,” and “There are parts of this journey that I do not yet have the skills for, it is now clear how I will reach those skills.” Additional representative comments are shown in Table 2.

Table 2: Student Responses to Project Effectiveness

• I think this process has been really insightful so far, and it has made me think more about my future and what I actually want my life to look like. • It has definitely changed my studies for the better as I have already found better ways to be a better worker and better student. • I think this will change my approach to my studies by making me think more critically about my qualities and what I put into my work. • I’ve learned that I need to focus on improving my mindset before I take bigger steps forward. • I’ve learned that there is a lot more that goes into meeting my goals • I have found goals for myself that I never thought I would have, and it has shown me that they are not as hard to achieve as I thought they would be. • Overall, it’s been a useful and motivating experience. Thank you lots! • In conclusion, I have gained a better understanding of my strengths and weaknesses and potential obstacles through this process.
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CHALLENGES AND LESSONS LEARNED

The primary challenge in implementing Project How to Be Awesome is driving student engagement. Given the nature of the exercise, there are pathways for students to receive good grades with little effort. In order to accomplish the project’s learning objectives, students must engage in significant introspection, self-assessment, and future-oriented thinking. Freeing up class time to work on the project and engaging with students directly on their work has been helpful.

Another helpful way to build engagement and improve quality has been breaking the project into four pieces, each building upon the previous. This forces students to go through a steady progression of thought, broken up into

manageable chunks over the course of a semester. From a grading standpoint, Project How to Be Awesome is somewhat intensive. The instructor must assess the responsiveness and whether or not the student followed the instructions but also must make determinations about the level of thought and introspection. These are more difficult to measure and assess, requiring time, care, and precise feedback. It also requires the instructor to be open to direct conversations with students about their efforts.

Over several years of assigning this project, we learned that outlining each deliverable ten days before it is due leads to better outcomes. Student engagement in assignments is higher when the instructor clearly communicates the importance and expectations. Outlining each deliverable, its expectations, and importance early, encourages students to prioritize the project and allows the instructor to offer frequent reminders and answer questions up to the due date.

Another lesson learned is expedient grading and feedback. We found that quick grading turnaround is critical to successfully implementing Project How to Be Awesome. Since students use the provided template, grading is efficient and can be done relatively quickly. In most cases, grades and feedback can be returned to students within five days of submission. This project can be graded by teaching assistants using standardized rubrics (see Supplemental Web Materials). Students are graded on their responsiveness to the prompts and their depth of analysis. The provided templates allow for a relatively quick and consistent assessment of these primary factors. The instructor trains the teaching assistant by grading a random sample of ten submissions together during a brief meeting. Once trained, a teaching assistant can grade an average submission in five to ten minutes.

Explicitly modeling engagement and the expected commitment level to the project will likely improve outcomes. The first author is currently developing a version of Project How to Be Awesome, applied to himself and his current station in life as a model for students. This aims to not only model the mechanics of a successful project but also build trust and engagement through open and honest personal communication with students.

CONCLUSION

Through implementation of Project How to Be Awesome, we have arrived at several useful conclusions. First, giving goal setting and motivation space in a required course is a direct signal that these are important skills for students to develop. Making self-assessment and goal setting salient for students early in their education appears to create a greater sense of agency. Second, repetition is a key to success. Successful implementation requires instructor vigilance. With four deliverables spaced out across a full semester, each requiring substantial grading, the logistical and energetic demands on the instructor are high. In our experience, however, the investment in this effort is worth it. Over the years, student buy-in to the process has increased. Finally, developing and implementing this project taught us that soft skills are a two-way street. In order to develop students' motivation, instructors must cultivate their own and put them to work. Though Project How to Be Awesome has landed on an efficient structure, it is a high involvement assignment that requires authentic and frequent communication.

Overall, this paper presents a project appropriate for undergraduate students in the Introduction to Business course. The project helps students with goal setting and motivation, two important soft skills that we found to be lacking in our recent graduates. We believe this project also helps students understand core business competencies, such as strategic thinking (e.g., problem framing and root-cause analysis, risk assessment, and trade-off evaluation) and organizational behavior (e.g., motivation, decision-making under uncertainty, and change management). We hope other professors can utilize all or parts of this project to help their undergraduate students understand the process of setting personal goals and the work that goes into achieving those goals.

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APPENDIX – A

Student Deliverable 1 Template: Student fills in template to perform self-SWOT analysis.

Strengths	Weaknesses
Opportunities	Threats

Student Deliverable 2 Template: Student sets goals across five different time horizons.

Short-term goals: I will accomplish the following three things in the next week, listed by priority.

1. Goal 1
2. Goal 2
3. Goal 3

End-of-semester goals: I will accomplish the following three things by the end of the semester, listed by priority.

1. Goal 1
2. Goal 2
3. Goal 3

Year-end goals: I will accomplish the following three things by the end of the year, listed by priority.

1. Goal 1
2. Goal 2
3. Goal 3

Long-term academic goals: I will accomplish the following three things by the time I finish college, listed by priority.

1. Goal 1
2. Goal 2
3. Goal 3

Life goals: I will accomplish the following three things in my life, listed by priority.

1. Goal 1
2. Goal 2
3. Goal 3

Student Deliverable 3 Template: Student analyzes gaps in skills needed for future goals.

Goal Category	Required Skills	What level of competence is required to achieve this goal? (1 - none; 10 - total competence)	What level of competence do I have now? (1 - none; 10 - total competence)	Gap
Short term goal	Skill 1			0
	Skill 2			0
	Skill 3			0
End-of-semester goal	Skill 1			0
	Skill 2			0
	Skill 3			0
Year end goal	Skill 1			0
	Skill 2			0
	Skill 3			0
Long-term academic goal	Skill 1			0
	Skill 2			0
	Skill 3			0
Life goal	Skill 1			0
	Skill 2			0
	Skill 3			0

Student Deliverable 4 Example: Student creates a plan to close skill gap.

Mitch Flapjack
BGEN 105s
Project: How to be Awesome, Deliverable 4

Introduction:

Please include a brief paragraph summarizing your goals and the skill gaps you identified through the first three phases of the project. Two to four sentences should be adequate.

Action Plan and Timeline:

****Order skill gaps by descending order or importance, with the most important gap to fill as #1, and the least important gap at the end.****

Skill Gap	Action or Resource Required to Close Gap	Timeline
Skill Gap #1 ¹	The thing I need to do and resource I need to access to close this gap ²	I will do this by [date]
Skill Gap #2	The thing I need to do and resource I need to access to close this gap	[date]
Skill Gap #3	The thing I need to do and resource I need to access to close this gap	[date]
Skill Gap #4	The thing I need to do and resource I need to access to close this gap	[date]
Keep going with as many Skill Gaps as you identified in Deliverable 3		

Conclusion:

In this closing paragraph please summarize what you learned going through this process. Has it changed your approach to your studies? Has it changed your view of yourself and your future in any way? Has it confirmed things you already know? Three to four sentences should be enough.

¹ Remember to keep goals and skills separate, and to be as specific as possible with your skills. "Communication" is a skill, for instance, but think even more specifically — verbal, written, and non-verbal communication are all distinct skills that might apply more or less to your goal.

² Success in this deliverable requires you to RESEARCH the on or off campus resources required to close these skills gaps. Be SPECIFIC — what will you do to close these gaps? What resources do you need to close these gaps?

APPENDIX – B

SMART Goal Framework with Examples

SMART Goal Framework	Exemplars from Students
S - Specific	<i>I want to schedule a time to meet with my academic advisor to discuss classes for next semester.</i>
M – Measurable	<i>Finish the semester with a 3.7 or higher GPA.</i>
A – Achievable	<i>Find a career that gives me financial freedom and independence while still being able to create media.</i>
R – Relevant	<i>I want to gain practical experience in the business world through internships in the summer that will assist me in getting a job after college.</i>
T – Time Bound	<i>Complete all of my Gen Ed requirements at the end of the academic year so that I can focus on major specific classes.</i>

Groping Toward a “Neoclassical Synthesis” Consensus in Teaching Intermediate Macroeconomics: The Target Audience Determines Content

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ABSTRACT

Many universities offer a junior-level course in Intermediate Macroeconomics. These courses typically emphasize theory and policy rather than statistical analysis. This paper analyzes the order and depth of presentation of individual topics in Intermediate Macroeconomics from a historical perspective, with particular reference to the Neoclassical Synthesis. The chronological development of the field of macro is used to motivate how topics are covered with the goal of enhancing student understanding of economic policies and their implications. The course design and implications for business education follow with specific examples of the course content. This approach is particularly useful in preparing undergraduate business students for careers in industry. The goal is that future managers and MBA students will develop more practical understanding of economic reasoning in general and macroeconomic policy in particular than they would by taking economics courses designed by economists for economists. The course may be developed with a minimum of higher mathematics. This requires an iterative, back-and-forth, graphical pedagogical style that somewhat resembles the *tâtonnement* (‘groping’, or ‘hill-climbing’) process to describe how markets obtain equilibrium. Further suggestions for extending and tailoring applications of the material follow.

Keywords: economic history, history of economic thought, Keynes, macroeconomics, neoclassical, Patinkin

INTRODUCTION

A pre-eminent economic historian, Rondo Cameron, wrote “how easy it is, without historical perspective, to mistake the symptoms of a problem for its causes” (Cameron, 1993, p. 4). Jacob Oser, in the first edition of his popular textbook, *The Evolution of Economic Thought*, wrote that

Economic thought is woven into the complex fabric of society. We should not wrench it loose and display it isolated from its social context. It must be analyzed and judged from the standards of the society out of which it grew. But this does not preclude our using the wisdom of hindsight to judge it in relation to its time (Oser, 1963, pp. 3-4).

These leading scholars and teachers in two separate academic subdivisions of economics, economic history and history of economic thought, advocated for teaching historical context in all branches of the discipline. This paper applies such historical context to present a true synthesis of Classical and Keynesian approaches using elements of simpler macroeconomic theories as building blocks for Intermediate Macroeconomics. The intended audience for the course is undergraduate business students who have completed a sophomore-level Principles of Microeconomics course.

A fundamental premise of the paper is that the continuing influence of the celebrated IS/LM model is strong (see Colander, 2004). A casual, small, sampling of some Intermediate Macroeconomics course descriptions from university websites indicates consistency with IS/LM as developed in the next section of the paper. Most of the websites do not mention supply behavior in the catalog descriptions (see Table 1 below).

For all of those descriptions in this small, informal, sample:

1. The emphasis tends to be on theory rather than empirical measures.
2. Monetary and Fiscal Policy are key topics.
3. “Supply-side” economics is rarely considered to be a key component of the course. Microeconomic foundations of individual markets and their interactions are seldom used to develop macroeconomic relationships between key variables (so far as macroeconomics can have micro foundations, see Romer (2018)). Most of the course descriptions reflect this absence.

Table 1: Some Differentiating Characteristics of an Informal Sample of Intermediate Macroeconomics Courses

	Differentiating Characteristics
Florida Atlantic U.	“Develops models of economic growth and macroeconomic fluctuation”
Iowa State U.	“Theory of income, employment, interest rates, and the price level”
North Carolina State U.	“Applied, analytical ... business cycles, stabilization policy ... output ...”
SUNY - Oneonta	“analytical tools and formal models ... assess impact of policy choices”
U. of Arkansas - Fayetteville	“Theoretical determinations of national aggregate employment” etc.
U. of California - Santa Barbara	“static, general equilibrium framework ... applications of theory...”
U. of New Mexico	“Theories ... explaining business cycles, aggregate supply, ...”
U. of Oregon	“evaluation of macroeconomic policies”
Vanderbilt U.	“Classical, Keynesian, and contemporary models ...”
West Texas A&M U.	“causes of fluctuations in production, income, ... economic stabilization”

Another property of the sample is that both research institutions and comprehensive institutions offer what is billed as the same course and would be accepted for transfer credit for most of them. However, there may be conflicting academic goals within the institutions’ missions. Some of them are geared toward preparation for doctoral studies in economics. Others may be more oriented toward professional credentials such as the M.B.A. A question pursued further below is “Can the same course serve both types of programs?” In other words, do two starkly contrasting audiences affect the appropriateness of the course content? If so, then how?

PREVIOUS RESEARCH – HISTORICAL DEVELOPMENT OF MACROECONOMICS

To determine how Intermediate Macroeconomics evolved in different directions, it may be helpful to consider how the subject developed over the past eighty years. A brief history of this development reveals the extent to which the intellectual battle between Keynesian and traditional economic traditions shaped how macro has been taught. As shown below, the first decade or so of macroeconomic study was dominated by Keynesian demand-side policy. Then, the emphasis on supply-side policies began to emerge with the work of Patinkin in the 1950s.

The “IS/LM” Model and its Successors

The macroeconomics literature generally goes back to the popular IS/LM model. To consider both Keynesian consumption models and Classical loanable funds models, Hicks introduced the merging of the simple Keynesian national income determination model and a money market in his seminal 1937 paper (Hicks, 1937). Modigliani (Modigliani, 1944) seems to have been first in applying the labels “IS” to the investment equals spending condition (p. 59) and “LL” to the money supply equals liquidity preference condition (p. 61) in solving for equilibrium rate of interest and level of national income. But Modigliani went one step further than did Hicks: he added a dynamic specification of wages as a function of the marginal product of labor as well as a static production function to capture a “supply side” that took into account firms’ behavior (p. 68).

By 1949, Hansen had fully developed what is known today as the IS/LM model in an influential effort to explain both Keynesian (demand) and Classical (supply) policy positions (Hansen, 1949). But neither Hicks nor Hansen incorporated a Neoclassical theory of the consumer or a static theory of the firm into macroeconomics. Hansen considered the behavior of firms in his treatment of investment spending (Samuelson, 1976) but had no viable multi-market framework to account for firms’ actions in supplying finished goods to consumers [see further (Breit and

Ransom, 1998) p. 93, including footnote 38]. To their credit, neither Hicks nor Hansen claimed to be presenting a general equilibrium approach.

Building on his doctoral dissertation (see Mehrling, 2001), Patinkin (Patinkin, 1949) did something remarkable. He pioneered the development of micro-foundations of the planned consumption spending function of simple Keynesian models using the following *ceteris paribus* thought experiment:

Every individual in the economy is approached, told that he must stay within his income and asked how much of each particular good he will buy at different sets of prices and personal income. This gives us the usual individual demand curves of Walrasian general-equilibrium economics. If we sum up these demand curves for all individuals and for all goods, we obtain the aggregate “desired” - consumption function. (p. 362)

But he went further in describing how the aggregate investment function *should* be developed:

We ask each firm how much it will invest at different sets of prices and national income, subject to the restriction that the firm’s inputs and outputs are related in a specified way (i.e., subject to the firm’s transformation function). The results of these experiments will, after aggregation, give us the desired-investment function. (p. 363)

In other words, the correct investment function depends on the firm’s production (transformation) function. This typifies Patinkin’s approach: he frequently went back to the dawn of modern economics to cite Ricardo, Malthus, Mill, and many others in modifying how commonly-used theories could be adapted for current applications.

He then critiqued the Keynes-Hansen dynamic multiplier-accelerator approach by noting that the behavior of firms was reduced to merely counting inventory in “behavior from the supply side of the market that is never explicitly introduced into the analysis” (p. 364). In other words, Keynesian models were biased toward considering demand and assuming that the supply side of the economy was inert and did not interact significantly with the demand-side. Put more plainly, Keynesians have tended to assume that the aggregate supply behavior never changes in response to changes in real variables.

While Samuelson repeatedly referred to the works of Hicks and Hansen and the subsequent Keynesian literature as “The Neoclassical Synthesis,” none of these developed a theory of aggregate supply in a general equilibrium setting [(Patinkin, 1949, p. 361, *passim*) (Skousen, 1997, p. 139, *passim*) (Evans, 1982)]. Samuelson appears to have never attempted a model that might *reasonably* be called a neoclassical synthesis that could put everything together. Regarding Samuelson’s concentration on Hansen’s “secular stagnation” accelerator principle (Samuelson, 1988), “the rate of interest is hardly mentioned” (Assous, Boianovsky, and Dávila-Fernández, 2024, p. 423). The secular stagnation doctrine dominated macroeconomic thought until about 1950, after which it virtually disappeared in the literature for another sixty years (Backhouse and Boianovsky, 2016).

Evidently, the Keynesians ignored the production half of the economy, relying instead on the conviction that Keynesian demand-side models can explain the short-run but not the long-run (Assous, Boianovsky, and Dávila-Fernández, 2022). The long-run, in Samuelson’s world, was addressed by the multiplier/accelerator principle of Hansen and the shared Keynesian conviction that market economies are unstable. Combined with Samuelson’s own “turnpike theorems,” anything short of flawless central planning and execution is likely to end up at Keynes’s famous remark that “we are all dead.”

Patinkin’s Approach

It was Patinkin, not Samuelson, who developed a model with an integrated supply side. He considered “three markets: finished goods, labor and money” as well as an unobserved bond market that acted as the residual of the other three through application of Walras Law (Patinkin, 1949, fn 1, p. 379). He then went on (Patinkin, 1956, 1965) to attempt a rigorous but reasonably complete general equilibrium macroeconomics model, building on the seminal paper of Hicks and using much of the demand methodology of Hansen. While general equilibrium analysis has proven to be a disappointment to modern economists (Ackerman, 2002), Patinkin (1965, pp. 44-45 and 182) used the iterative *tâtonnement* (‘groping’, or ‘hill-climbing’) process to describe how all markets obtain equilibrium. Ironically, a similar iterative, back-and-forth, process seems to be a good descriptor of the way in which macroeconomic study was developed after Keynes.

In addition to expanding the micro foundations of the Aggregate Demand curve (AD), Patinkin also borrowed a simple version of the Neoclassical Theory of the Firm to provide the basis for a model of the Aggregate Supply curve (AS). He developed “a closed and elegant monetary model” as well as a “formal analysis of the Keynesian model” (Liviatan, 2006, p. 1). This work was influential in formulating macroeconomic policy for many countries, including the U.S. and Israel (Krampf, 2010). It is for these reasons that the Patinkin model better deserves the descriptor “Neoclassical Synthesis” than anything that went before it. It also can provide an excellent way to introduce business and economics students to more advanced model-building after they have been introduced to economic terminology and marginal analysis in a standard Principles of Microeconomics course as a prerequisite.

Froyen, the author of a popular intermediate macroeconomics textbook, noted that Patinkin at first “had little direct effect on the teaching of intermediate macroeconomics” but a huge effect on graduate courses (Froyen, 1996, p. 109). Since *Money, Interest, and Prices: An Integration of Monetary and Value Theory* was virtually the only applied general equilibrium model, it gradually became the foundation for many intermediate macro textbooks of the 1960s through 1980s (Crouch, 1972) (Wykoff, 1981) (Mankiw, 1992). It also figured as well in Lucas and Rapping’s path-breaking analysis of expectations and Phillips Curves (Lucas and Rapping, 1969 p. 724, fn.3, and 729). Expanding analysis well beyond the earlier, demand-centered, approaches of the 1930s and 40s, Patinkin’s version of the neoclassical synthesis provided policy advisors with a tool for analyzing the effects of economic stimuli on several variables, including short-term, real, rates of interest, employment, prices, and wages. Using comparative static equilibrium analysis, students were required to develop a basic understanding of how exogenous variables affected key endogenous variables. Dynamics were then treated as the behavior of the entire static model over time rather than as *ad hoc* bits and pieces that characterized the new, Keynesian, partial equilibrium models (alluded to by Froyen, 1996, p. 111).

Unfortunately, such anomalous theories as the secular stagnation doctrine dominated much of the macroeconomic discussion among those who taught in doctoral economics programs. In the meantime, Patinkin’s book finally went out-of-print for the final time and his approach retreated into undocumented “oral traditions” at various universities in a hit-or-miss fashion.¹ The prime exception seems to have been Barro’s influential textbook (Barro, 1984), which went through several editions and aimed for a general equilibrium synthesis.

Today, the IS/LM approach seems hale and hearty, despite repeated predictions of its imminent demise. But it has emerged largely as a purely *ad hoc* shadow of its former self. Krugman, not normally known as a macroeconomist, characterized it as a simple, but useful, reconciliation of a loanable funds market with the tradeoff between bonds and real balances that still accounts for important concepts such as GDP and short-term interest rates. Krugman scrupulously avoided Samuelson’s “neoclassical synthesis” label (Krugman, 2011). Yet the IS/LM approach without Patinkin’s contributions remains decidedly skewed in favor of demand.

COURSE DESIGN

Since most of the author’s experience has been in teaching in business schools, a suggestion for business-bound students is to use a modified Patinkin approach with all parts, including “the supply side,” defined heuristically, or practically (Polya, 1945), as follows later in this section. In this way, students are required to consider how and why to construct models from first principles, a skill that may be of value in other branches of economics as well. In addition, it follows the recommendations of both Cameron and Oser as quoted earlier in this paper.

Table 2 below shows the first stage of building such a model with students (Patinkin, 1965 and Crouch, 1972). At this stage, elemental devices such as the Circular Flow of Income, Classical Labor Market, Loanable Funds Model, and Equation of Exchange are very useful in deriving the theoretical underpinnings of the larger model. Stage I is where these are explored through the *mutatis mutandis* and *ceteris paribus* thought experiments found throughout Patinkin’s textbook (Patinkin, 1965, p. 33). The results of these thought experiments are gathered in curves, or schedules, that are plotted in a deliberate succession of Cartesian coordinate system planes with pairs of endogenous variables plotted on the axes. The student must realize that it is up to that student to manipulate specifications according to the framework that she is trying to use. The hypothetical relationships between both endogenous and exogenous variables are to be derived using history, casual observation, and/or very limited, simple, regression models. This allows

conservation of observations in order to use remaining available data for more extensive empirical testing later in Stage III.

Table 2: Stage I of III in heuristic model-building

Step 1	Consider hypothetical changes in endogenous variables in pairs, <i>ceteris paribus</i> , with one of the variables as cause and the other variable as effect
Step 2	Draw curves (pair-wise graphical relationship between endogenous variables) with the cause variable on one axis and the effect variable on the other axis
Step 3	Solve for (partial) equilibrium values of endogenous variables (intersections of curves at initial static equilibrium)

It is important to note that students need not master calculus in order to understand how to develop and put together the building blocks of an economic model. Instead, they must be able to put their equations into graphical form and keep track of their overall analytical framework as they build it piece-by-piece. This stage must be repeated with each specification that builds on previous theories. As an example of Stage I in developing the LM, or money market equilibrium, curve, note that the LM equation is commonly written as

$M/P = m^d(y, r)$, where $\partial m^d/\partial y > 0$, $\partial m^d/\partial r < 0$ and
 where M = nominal money supply,
 P = price level,
 m^d = real money demand,
 y = real national income, and
 r = real short-term interest rate.

The partial derivative symbol, ∂ , need not be employed in an undergraduate course for business majors since the mere mention of calculus may be sufficient to prematurely blow students' minds. Instead, demonstrating to the students that real money demand depends positively on the value of real national income and negatively on the value of real interest rate can suffice. In this way, all of the various curves, including IS (Keynesian loanable funds market), AD (aggregate demand), AS (aggregate supply), L^S (labor supply), L^D (labor demand), and the neoclassical production function can be drawn and/or shifted in the larger framework by repeating Stage I experiments like the example that follows.

Step one is drawing the LM curve. The LM curve is plotted in r/y space. The vertical axis measures real interest rate, r , and the other axis measures real national income, y . The student has to choose a starting point for comparison purposes. This starting point is labeled "A." Letting only two variables change at a time, the student changes one of the two endogenous variables, either y or r , and then uses the information from the equation in step two to find the change in the effect variable (either r or y). Since only two variables are allowed to change for each *ceteris paribus* experiment, the remaining, third, endogenous variable, P , is assumed constant *for the time being*. In Figure 1 below, the student has elected to let r rise as the first step of the experiment.

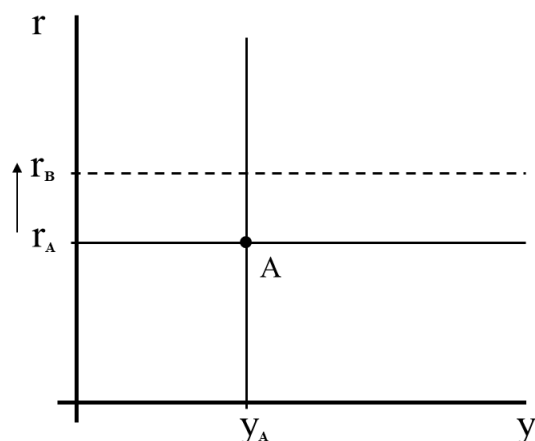
In the second step, shown in Figure 2, the student uses the information from the LM equation to discern which direction y must change in order to preserve the LM equation. Since the student has assumed that r has risen, the LM equation is not an equation anymore so long as y is stuck at y_A . Instead, the LM relationship acts as an inequality: $M/P > m^d(y, r)$ since the right-hand-side of the equation (RHS) has fallen because of the rise in r . The only way in which the effect variable, y , can change that will restore the LM relationship to an equality is for y to increase, therefore bringing the RHS back up to equal the LHS again, thus restoring the equality between the two sides. This is an example of "backing into" the relationship between two endogenous variables that is implied by the information within the equation vis-à-vis the famous quote by the fictional detective, Sherlock Holmes, that "when you have eliminated the impossible, whatever remains, *however improbable*, must be the truth." (Doyle, 1890, p. 93). The combination of the higher value of the causal variable, r_B , and the higher value of the effect variable, y_B , gives a second point on the LM curve (since the LM relationship is restored to an equation), point B.

Note that the same effect could have been obtained instead by letting r fall as the causal variable, which would have resulted in the RHS of the LM relationship being greater than the LHS [$M/P < m^d(y, r)$] which would mean that y

would have to fall in order to restore the LM to equality. Either way, point B is in the same position relative to point A: it must lie upward and the right of point A, as illustrated in Figure 2 below. Of course, these steps must be repeated for each of the components of the overall model, such as the IS relationship, labor market, and production function.

Figure 1: First step of drawing LM curve using information from LM equation

Drawing the LM Curve – Step 1

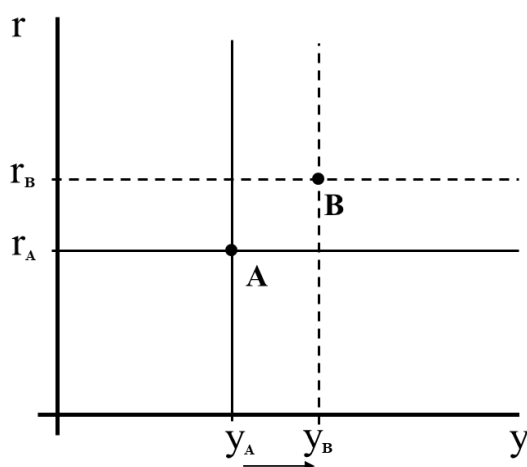


Students should be reminded at each iteration of the process that the process is always the same and that only the endogenous variables on the axes of the graphs that they are drawing will change for each equation that they are exploring. In this way, students may come to see that they are in control of the process and that where they start in their analysis and which curves they shift or when is far from magic or the result of chance. In addition, they do not have to memorize how or why the curves shift or what the implications are for equilibrium values of endogenous variables. Instead, they have to practice plotting the equation purposely with particular steps in mind.

In addition to framing macroeconomic policy rigorously, students develop skills in manipulating mathematical models graphically, and staying within the boundaries of comparative static equilibrium analysis to “turn the model on its head” (the reversal of causal variable roles between steps one and three) to extract and use the most information possible out of the individual sub-theories (money market equilibrium in the case of the LM).

Figure 2: Second step of drawing LM curve using information from LM equation

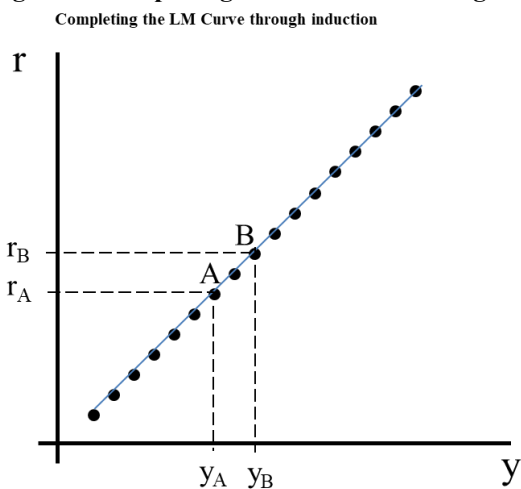
Drawing the LM Curve – Step 2



Yet another way in which the experiment could have been conducted toward the same end would have been for the student to choose y as the causal variable and r as the effect variable. Had the student elected for y to rise in the initial step, then the effect variable, r , would have to needed to rise to restore the equality in the LM relationship (not shown).

Either way, repeating the experiment for all values of the cause variable will trace out an upward-sloping curve that must pass through both points A and B. Since it is beyond the capability of most students (and professors) to repeat an experiment for an infinite number of trials, by math induction the student is able to appeal to the emergent pattern and draw the upward-sloping LM curve that passes through A and B as shown in Figure 3 below.

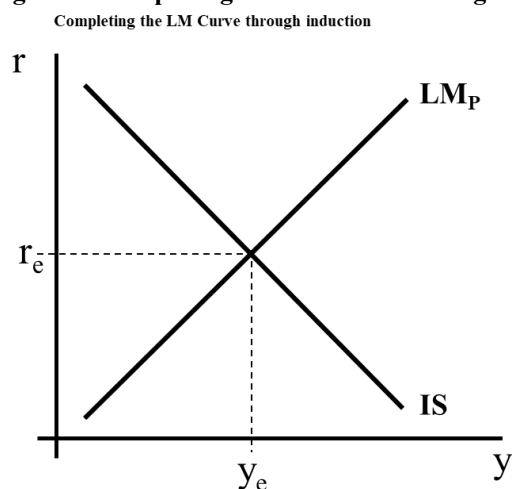
Figure 3: Completing the LM Curve through Induction



steps 3 - N

The completed version of the LM curve without the intermediate points A, B, and others, is shown below in Figure 4. The finished LM curve has a subscript, **P**, to demonstrate that **P** is a shift variable for the LM curve. In other words, when **P** changes, *ceteris paribus*, the LM curve will shift according to the information contained within the LM equation. This is because a new thought experiment, in which **P** is the causal variable, will cause the LM to be in inequality and either **r** or **y** must adjust in order for the equation to hold. Since only two variables may change at a time for a curve shift, either **y** will be held fixed and **r** will vary, or **r** will be held fixed and **y** will vary. Again, like the original experiment in drawing an LM curve, using either of these arrangements results in the same relative position of the curve as the other. The student merely has to use the framework as a mechanism to keep up with the variables the student wishes to analyze.

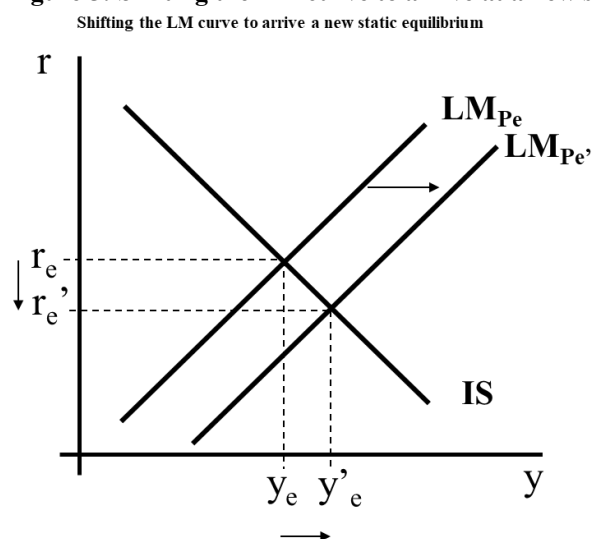
Figure 4: Completing the LM Curve through Induction



Step three is also shown in Figure 4. Where the LM curve intersects the IS curve (determined independently by graphing the IS equation), specific equilibrium values of the two endogenous variables, y_e and r_e , are obtained. The linear independence of the LM equation from the IS equation provides sufficient information that the two equations are sufficient to solve for the two unknowns.

Stage II, comparing static equilibria, is depicted in Figure 5. A change in any of the exogenous variables which was previously assumed to have been fixed will then shift the LM curve. For example, a decrease in P , increase in M , or decrease in m^d will all have the same effect of shifting the LM curve to the right (if r adjusts while y is assumed fixed) or downward (if y adjusts while r is assumed fixed) as shown in Figure 5 below. As before, this result comes entirely from the experiment the student chooses to conduct using the LM equation. For example, using the LM equation, if P is the causal variable and decreases, then the LHS of the LM equation rises (since the denominator is rising). In order to be a point on an LM curve, the LM relationship must hold as an equality, which means that the RHS must also rise, which can only come from an increase in y or a decrease in r , *ceteris paribus*. It is straightforward to infer that an increase in M or decrease in m^d would have the same effect of shifting the LM curve to the right (if y is allowed to change as the effect variable) or downward (if r is allowed to change as the effect variable instead). In either case, the new LM curve and old IS curve now intersect at a lower equilibrium r and higher equilibrium y , regardless of what had temporarily happened to either r or y while they served as the effect variable for purposes of determining the direction of the curve shift.

Figure 5: Shifting the LM curve to arrive at a new static equilibrium



In Stage II of III, portrayed in Table 3 below, students are shown the comparative statics process in which each problem starts with a change in a single, particular, exogenous variable and traces the effects by shifting the appropriate curves to indicate the direction of change of each endogenous variable. At this point, the first two stages may be repeated with some more realistic assumptions consistent with real balance effects, sticky wages, and other changes in static specifications to indicate how the analysis would be affected in these situations. Both Stages I and II force students to be thoroughly grounded in deductive (inferential) logic, a.k.a. the Holmes quote mentioned earlier. Stage I requires students to formulate the theoretical graphs of the model by establishing hypothetical relationships between pairings of possible values of endogenous variables (drawing movements along the curves). Stage II requires them to work the processes in reverse by shifting curves in order to find new static equilibrium values of the endogenous variables and compare them with their initial equilibrium values. As mentioned earlier, inductive logic is demonstrated in the “if this experiment is repeated for every possible value” assumption regarding each the causal variable in each graph.

In Stage III of III (shown in Table 4 below), dynamics may be considered *if time permits*. While Stage II may seem somewhat mechanical, in Stage III phenomena such as the accelerator principle and rational expectations may be more fully considered with minor modifications to the static model. As mentioned earlier, dynamic results from Stage III may help to “nail down” more precise static parameters, particularly from stability requirements that close or complete the model with information not contained directly in the static relationships.

Table 3: Stage II of III in heuristic model-building

Step 1	Changes in exogenous variables in pairs, <i>ceteris paribus</i> , with one of the variables as cause and the other variable as effect
Step 2	Draw shifts in curves (considering the previous cause variable as fixed as part of the <i>ceteris paribus</i> list of variables)
Step 3	Solve for new equilibrium values of endogenous variables by finding the intersections of the curves at a new static equilibrium)

Table 4: Stage III of III in heuristic model-building

Step 1	Develop phase diagrams of static model graphs based on disequilibrium (inequalities instead of equations)
Step 2	Accumulate experimental or secondary data to test both static and dynamic results of model using statistical hypothesis testing
Step 3	Evaluate initial model assumptions in deriving more accurate equations by revisiting Stage I and iterating through Stages II and III again

Implications for Business Education

A course that is intended for business students probably *should* be much different from a course that is intended for professional economists and economics professors. As one author of a popular intermediate macroeconomics text has implied, there seem to be two different worlds in play: “The real world of macroeconomic policymaking can be disheartening for those of us who have spent most of our years in academia” (Mankiw, 2006, p. 42). Nevertheless, the textbooks cited, including Mankiw’s, are all excellent works, *when used for their intended purposes and audiences*.

There are several ways to tailor the IS/LM framework to the audience. As Araujo, et. al., have said:

instructors are faced with three main decisions: (1) the usual decision about how the course will address different schools of macroeconomic thought, a decision crucial to how stabilization policy issues are addressed; (2) the decision as to where the course should fall on the traditional-modern spectrum; and (3) the decision on how much to focus on one particular framework versus competing frameworks (Araujo, O’Sullivan, and Simpson, 2013, p. 75).

For economists, ideology is an obvious differentiator in Intermediate Macroeconomics. Less traditional schools, such as Keynesians, Institutionlists, Marxists, Socialists, etc. tend to view the macroeconomy as always moving in transition between static equilibria (if static equilibria even exist). For such market segments of macroeconomics students, the dynamic processes of disequilibrium are more important than steady-states. The IS/LM framework tends to yield discouraging results in such cases since that model was constructed for and lends itself to market forces that result in equilibrium. For the central planning academic heirs of Keynes, the dynamic aspects of a model tend to be the most interesting since it provides so many opportunities to manipulate the demand-side. Little wonder, then, that Hansen, Samuelson, Solow and other Keynesians were willing to forgo a more nearly-complete system in order to develop partial-equilibrium models for explaining anomalies rather than regularities. Some have celebrated a *new* Neoclassical Synthesis consensus that seems to imply that policymakers are united in their monetary policy recommendations (Woodford, 2009) (Goodfriend, 2007). Whether or not this would now be the case in post-2016 America is, at best, debatable. In any event, Goodfriend and King’s (1997) comprehensive and excellent review of the partial equilibrium dynamic new-Keynesian literature is beyond the scope of the many business-oriented programs that offer a single intermediate macroeconomics course at the junior-level.

For undergraduate business students, it is not very useful to devise a clever model of the latest macroeconomic puzzle (anomaly). Instead, it is particularly important for business economics professors to take out as much of the “magic” about why the system works the way does (regularities). That is why it is essential to carry the process out in both

Stages I and II methodically, step-by-step. Common questions that business students have are: 1. “Why do I start here?” 2. “How do I know when I am finished?” and 3. “What is the order of steps, and why?”

To stem the danger that understanding becomes merely mechanical, the IS/LM/AD/AS framework is particularly useful since it may be developed sequentially in stages on a historical footing, following the history of how macroeconomics was developed in the twentieth century. This gives students a basis for understanding applications in the real world rather than reinforcing some obscure, distant, ivory tower. Is this, perhaps, why most science courses still enshrine historical figures in science, such as Newton, Einstein, Boyle, and Darwin, along with their theories?

As alluded to earlier, first steps should include a loanable funds model that can demonstrate how short-term interest rates are determined by financial markets and institutions. A classical labor market demonstrates how relative labor supply and demand affect wage which in turn determines output. A crude quantity theory of money relates money supply to price level. These three elementary models represent the heart of Keynes’ strawman version of the predominant economic analysis before his *General Theory*: three, unrelated, islands of economic activity that are not coordinated and may well be at odds with each other.

Then, a simple circular flow model suffices to illustrate national income and aggregate spending. Adding more sectors to a circular flow motivates the idea of a Keynes-type consumption function in order to illustrate his contention that national income rather than a short-term interest rate determines saving and investment. The multipliers then flow from a very simple Keynesian national income determination model. But students should be reminded that everything up to this point in the course is extremely simple and unrealistic and that realism comes at the price of complexity. At that point in the course is the optimal time to introduce the Hicks/Hansen approach in context of the IS/LM framework in a purely fixed-price model. Such topics as real balance effects, accelerator principles, and sticky wages do not necessarily need to be introduced here. Those can wait for Stage III in the more complete model.

For simplification, the AD curve can be derived as the relationship between interest rate and national income based solely on the LM equation, even though price level really *should* be included through a real balance effect in consumption spending. Introducing real balances into the consumption function or national income into the investment spending function does not add much generality and prematurely complicates students’ understanding of the method. Like the more dynamic aspects of macroeconomic behavior mentioned earlier, such concepts are best left until students can see just why *ceteris paribus*, exogeneity vs. endogeneity, and real vs. nominal variables are all important concepts. Finally, a simple neoclassical production function, with labor as the only input, may be used in conjunction with the classical labor market and flexible wages to derive an AS curve.

In this way, students learn to build an economic model from first principles and obtain a basic understanding of the historical context of each aspect of the model instead of jumping the gun and prematurely ploughing full bore into the disequilibrium dynamics of Stage III. If students are diligent, they can develop a degree of economic intuition in anticipating what effects that each of the complicating, more realistic, assumptions will have on the general equilibrium system. There might even be enough time left in the semester to consider more heterodox approaches like endogenous business cycles and speculative bubbles (Kindleberger, 1996) by framing them in the context of the standard Patinkin model. Furthermore, there may be some stability insights from dynamics that help to specify how the statics work, as alluded to earlier. But Stage III is very difficult to get to, much less complete, in a single semester course. As mentioned earlier, it is not clear that extensive treatment of dynamics even needs to be attempted in Intermediate Macroeconomics. Apart from phase diagrams demonstrating the necessity of stability conditions in a graphical framework, a full-blown consideration of dynamics should probably be postponed until an Advanced Macroeconomics course which requires calculus and differential equations as prerequisites.

From a purely pedagogical viewpoint, comparing and contrasting Keynesian and Classical viewpoints provides additional exercises and opportunities to extend the approach. For example, the initial iteration of the static model is done easier with a flexible nominal wage model in which the labor market always clears and the Aggregate Supply curve is always vertical. The second iteration may be done with a Keynesian sticky wage assumption, such as the minimum wage law. The resulting upward-sloping AS curve indicates policy impacts of very simple assumptions. Yet another variation can be the presence of money illusion, in which laborers adjust their work decisions based on nominal rather than real wages¹.

Ongoing Issues in Presenting Macroeconomic Models

Some have advocated the removal of the LM specification altogether [Weerapana (2003), citing Romer (2000) and Taylor (2000)]. The original idea in reformulating the money market beyond the LM model was to be able to consider *endogenous* Federal Reserve policy such as targeting interest rates. This idea may have merit but seems to have been motivated primarily by issues that may be of secondary importance to policy makers, such as the Keynesian liquidity trap. The Keynesian liquidity trap is an idea that resurfaces from time-to-time despite skepticism that it even exists. Like the Keynesian “Paradox of Thrift,” it is primarily an intellectual oddity. If it exists, which is debatable, then it is certainly not the fodder of an intermediate economics course for non-Ph.D.-bound college juniors and may well crowd out more important concepts for most students taking the course.

The persistence of phantom phenomena in macroeconomic theory, such as the secular stagnation doctrine, the Liquidity Trap hypothesis, and the Paradox of Thrift fallacy, raises an important question that can be addressed but will not be answered here: “Is the primary purpose of an intermediate macroeconomics course to try to posit and explain anomalies or to elucidate regularities (or something else altogether)?” If understanding anomalies is the goal, then Romer’s IS/MP/IA model (pp. 9 - 14) is likely essential, and the dynamic, albeit *ad hoc*, Keynesian concepts like liquidity traps and secular stagnation should be emphasized. After all, anomalies breed journal articles that help graduate research economists obtain grants and tenure. But if the goal is for students to understand how to build and modify equilibrium models for practical use in business or policy [understanding empirical regularities as the theoretical underpinnings of the model (Mussa, 1979)], then using dynamic interest rate rules to replace the LM curve may not be optimal for *any* undergraduate intermediate macroeconomic study. It is certainly inappropriate for students who are not bound for graduate economics programs. In any event, does it not make more sense for students to first be able to explain regularities before they venture into the much more obscure and mathematically difficult anomalies?

Returning to the last question posed in the Introduction above, “Can the same course serve both types of programs?” it appears, after all, that whether or not an intermediate macroeconomics course is offered to economics majors or business majors really matters. Most economics departments are standalone units in Colleges of Arts and Sciences, but most undergraduate economics courses are offered in Colleges of Business. If the purpose of the course is to prepare the undergraduate student for a Ph.D. program in economics, then an approach such as that taken by Mankiw and Romer in their texts is entirely appropriate and necessary, particularly when there is no master’s level macroeconomic course offered. But in business schools, economics is considered a set of practical, conceptual, tools to provide a solid foundation for other courses in finance, management, and other majors. The inclusion of alternatives to the IS/LM approach may not leave enough time for proper consideration of alternative approaches such as the Minsky/Kindleberger study of speculative bubbles, at least for business-bound students. Two different student populations with two starkly different career goals require two very different courses. At this point, resources that reinforce the knowledge of how to construct models and think economically (like Patinkin) are in short supply.

The overwhelming advantage of a historical approach to teaching macro is that it provides context. For students who have no experience with or memory of economic depression or inflation, a major oil embargo, or a world war, some economic history and even history of economic thought may be more important than for previous generations. Films such as the PBS documentary, *Commanding Heights*, are essential contextual tools for students to understand, employ, and carry forward concepts that sprang from other eras before they were born.

The “supply-side” approach was seldom considered a serious approach in graduate economics studies until the 21st century (Bartlett, 2007). Since the era of “Reaganomics,” congressional staff has gradually transformed from a demand-side perspective to supply-side advocacy through the first Trump Administration (Bartlett, 2015). Now that policy staff members are comfortable with a more complete model, Patinkin’s version of the IS/LM/AD/AS approach may be considered more useful for contemporary policy analysts than it was during the pre-1970s Keynesian dominance.

Ideally, master’s level or advanced undergraduate students would be able to refer to an elegant and peerless reference work for economics professors and advanced students that carries Patinkin’s work into dynamics and incorporates expectations, like Sargent (1979), *after having already mastered Patinkin’s static approach or its equivalent* in a graphical approach. Sargent’s book and other Neoclassical macro works have the potential to satisfy both Classical and Keynesian adherents, but at a much higher level than practical for an intermediate level textbook (particularly in a course which is not designed to prepare the student for a Ph.D. program). For example, those works tend to require

thorough grounding in stochastic methods, econometrics, difference equations and higher math, all of which are beyond the level of most college juniors (even business majors).

As quick treatments for supply-side phenomena the instructor can link supply-side policies with their static effects on real variables. There are many examples of how fiscal policy can have supply-side effects [see (Keleher, 1982) or any of the dozens of papers in the same volume (Hailstones, 1982)]. For example, an upward-shift in a production function suffices to introduce students to the effects of labor productivity. Human capital changes, expectations, and stability considerations may also be (partially) considered in the framework. Physical capital is more difficult to deal with, since the easiest treatment of it by shifting the production function may not produce results that are consistent with the investment spending behavior implicit in the Hansen IS curve. If the instructor wishes to address “crowding-out,” Stage III may be the most appropriate place to do it.

CONCLUSIONS

The methodological defects in deterministic, static, models like IS/LM/AD/AS are real. Discussing such defects is desirable but can also go beyond the effective range of most junior-level intermediate economics courses, particularly in business schools. Instead, Intermediate Macroeconomics should concentrate on how students may model economic phenomena using simple issues before raising more realistic, complicating, factors. Model-building skills that are developed in the Patinkin approach are potentially much more useful for students in other branches of economics or even in other academic disciplines. Addressing other economic issues, such as supply-side policy, minimum wage, and other policy questions in a Patinkin-type model may be done at the junior-level. However, the concentrated study of advanced, partial-equilibrium, macroeconomic issues and other esoterica should be reserved for the rare student who is bound for doctoral studies in macroeconomics and desires to explain anomalies in journal articles for publication. A one-size-fits-all intermediate macroeconomics course probably underserves both business and economics majors.

Patinkin’s method of developing and teaching macroeconomics borrowed heavily from the history of economic thought. His approach is particularly useful in establishing causality from policy to theory, as recommended by both economic historians (Cameron) and historians of economic thought (Oser). If Intermediate Macroeconomics can use historical perspectives to motivate economic modeling, then it has the potential to be the most valuable course in the economics curriculum.

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Endnote:

1. The author is indebted to Professor William R. Russell, late of Southern Methodist University, for initial exposure to this methodology in an oral tradition which has since been adapted and extended in the classroom by others. Russell's use of the money illusion example is a particularly useful variation of the Patinkin approach as it applies to rational (or irrational) expectations.

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Using AI to Streamline Grading in Large Enrollment IS Courses: A Dual Feedback Approach

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ABSTRACT

This study presents an AI-assisted dual feedback model implemented in a large undergraduate Management Information Systems course. The model reduced grading workload while improving feedback depth, personalization, and timeliness through individualized comments and whole-class summaries. Generative AI tools produced rubric-based draft comments that instructors refined before returning to students. Results show grading time decreased by 65%, while feedback length and specificity increased. Survey data reflected improved perceptions of fairness, clarity, and commitment to learning. The purpose of this study is to examine whether an AI-assisted workflow can simultaneously increase instructional efficiency and enhance the clarity, quality, and perceived fairness of feedback. The model addresses the challenge of providing actionable feedback at scale in classes of 180+ students and demonstrates how AI can balance efficiency with personalization in business education. This work offers a scalable approach aligned with AACSB expectations and Quality Matters standards.

Keywords: generative AI, grading, feedback, large-enrollment courses, MIS, Quality Matters, AACSB

INTRODUCTION

Teaching large-enrollment business courses is highly rewarding yet also challenging. A central difficulty lies in grading: instructors must deliver timely and meaningful feedback to every student, but in classes of 150–200 learners, comments often become brief or generic due to workload pressures. Research underscores that well-designed feedback is among the most influential drivers of student learning, particularly when it enables learners to interpret and act upon it (Nicol, 2010; Carless and Boud, 2018). Students consistently request more detailed, actionable feedback. At the same time, accreditation bodies such as AACSB emphasize evidence-based teaching practices, and Quality Matters (QM) provides rubrics to strengthen course design, alignment, and feedback quality.

The rise of generative artificial intelligence (AI) presents new opportunities to address these challenges. AI tools can generate draft comments and summaries, which instructors can then refine. Prior research indicates that AI can enhance creative problem-solving (Urban et al., 2024) and has been associated with efficiency gains in higher education (Wu et al., 2024). However, little is known about how AI can support feedback at scale in business education. Existing studies focus primarily on student-facing uses of AI, leaving a gap in understanding how instructors might leverage AI to improve grading workflows while maintaining high-quality assessment and feedback practices. To address this gap, this study pilots an AI-assisted dual feedback model in a core MIS course. The approach combines individualized AI-assisted grading with whole-class summaries, demonstrating how AI can enable scalable, high-quality feedback in large classes. The model aligns with QM's emphasis on meaningful, timely, and actionable feedback, as well as AACSB expectations for data-informed instructional improvement. The results provide practical lessons for instructors and contribute to research on AI adoption in education. Despite these advances, there remains limited empirical evidence on how AI-assisted grading models affect both instructional efficiency and student perceptions in large business courses.

Building on this context, the study is guided by two research questions:

- RQ1: To what extent can an AI-assisted dual feedback workflow reduce grading time and increase instructional efficiency in large-enrollment business courses?
- RQ2: How does the workflow affect the clarity, quality, and perceived fairness of feedback from the students' perspective?

The remainder of this paper is organized as follows: the next section reviews related work; the methodology section describes the course, assignments, and AI workflow; results and discussion present outcomes and insights; lessons learned and recommendations follow; and the paper concludes with contributions, limitations, and directions for future research.

RELATED WORK

Research on AI in education falls into three strands, each of which informs but does not fully address the challenge this study tackles.

AI and learning outcomes

Urban et al. (2024) provide empirical evidence that ChatGPT use can enhance creative problem-solving in higher education contexts. Their study shows that generative AI can extend students' ability to generate novel solutions. Wu et al. (2024) conducted a systematic review of more than fifty empirical studies on generative AI in higher education; they report associations with improved efficiency, confidence, and student achievement. While these works underscore the potential of AI to improve student performance, they remain focused on student-facing applications. In contrast, our work shifts the lens to the instructor side: specifically, how AI might assist faculty in delivering high-quality feedback at scale. To frame this shift, we synthesize prior research into an Efficiency-Adoption-Confidence (EAC) perspective. This integrative lens emphasizes that AI-supported teaching innovations must (a) improve instructional efficiency (Heidari and Pishvaei, 2022), (b) be adopted and accepted by users (Davis, 1989; Fan et al., 2025), and (c) build learner and instructor confidence in the feedback process (Carless and Boud, 2018; Dawson et al., 2019).

AI adoption, instructional design, and user experience

Belkina (2025) explores how integrating generative AI into higher education can mitigate instructors' workload and cognitive burden, though direct empirical evidence of reduced extraneous cognitive load remains limited. Fan et al. (2025) applied the Technology Acceptance Model (TAM; Davis, 1989) to examine student adoption of AI in programming tasks, finding that perceived usefulness and ease of use shape adoption. Kim and Kim (2024) investigated ChatGPT in MIS classrooms, reporting gains in engagement and learning outcomes when AI was embedded in class activities. Tasdelen (2025) examined context-personalized AI learning materials, showing opportunities and risks in tailoring materials to learners' needs. These studies contribute to understanding adoption and instructional design, but they stop short of addressing how AI can be embedded into core instructor workflows such as grading and feedback.

Quality frameworks

The Quality Matters (QM) rubric emphasizes alignment among objectives, assessments, instructional strategies, and feedback (Shattuck, 2013). Lopez and Waller (2020) applied the QM rubric to evaluate online business courses, focusing on alignment and feedback quality. Martin et al. (2022) identified design, facilitation, and feedback as pillars of award-winning online teaching. Most prior studies only assess courses against QM or similar frameworks. Few studies examine how AI can actively help instructors meet these standards. Our study addresses this gap by showing how AI-assisted dual feedback - individualized comments plus whole-class summaries - can implement QM's emphasis on measurable objectives, aligned assessments, and meaningful feedback in a large MIS course.

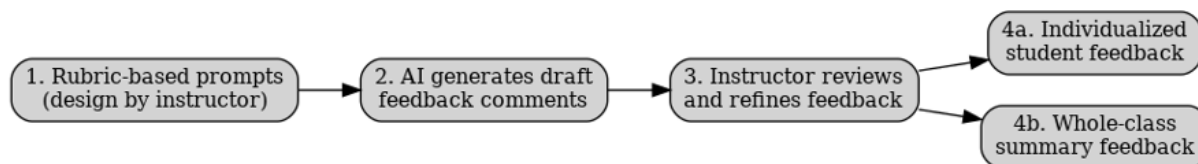
Together, these strands highlight why this study is novel: it shifts the focus from AI as a student tool to AI as a faculty ally through an AI-assisted dual feedback model that enables scalable, high-quality feedback while reducing instructor burden.

METHODOLOGY

The study took place in "Using Information Systems and Digital Technologies for Solving Business Problems", a core BBA course for Computer Information Systems, General Business, and Business Management majors at Kent State University with approximately 200 students. Two video case discussions were assigned, where students wrote essay-style posts and replied to peers. Posts were graded using a rubric covering clarity, use of MIS concepts, depth of analysis, and engagement with case details. Traditionally, grading one cycle required about 30 hours, and feedback was short (1-2 sentences). To streamline grading, the AI-assisted dual feedback model was implemented in four steps: (1) designing rubric-based prompts to guide AI output; (2) generating draft comments with AI; (3) instructor review/editing of each draft (under one minute per student); and (4) returning refined feedback plus anonymized whole-class summaries. In addition, lightweight Python scripts were implemented to automate participation checks (verifying each student's initial post and required replies) and to batch-prepare discussion texts for AI processing, further streamlining the workflow. All student submissions were de-identified and analyzed; texts were copied into AI tools using structured, rubric-aligned prompts, and AI output was manually reviewed, edited, and customized by the instructor before release to ensure fairness and alignment with course expectations. Figure 1 illustrates this

workflow, showing how individualized feedback and whole-class summaries were integrated into a single model to enhance both student learning and instructor efficiency.

Figure 1: Workflow of the AI-Assisted Dual Feedback Model in a large MIS course



Rubric-Aligned Prompt Design

The discussion assignments were graded using a two-criteria rubric assessing (1) the initial post and (2) response posts. Each criterion emphasized completeness, critical thinking, relevance, and evidence-based support. To ensure alignment between the rubric and AI-generated feedback, short, structured prompts were created for each component. The examples below illustrate how rubric criteria were translated into concise, actionable prompts that guided AI-generated draft feedback:

- Example Prompt 1: Initial Post

“Evaluate the student’s initial post based on the rubric. Comment on whether the post responds to all parts of the question, shows critical thinking, and uses course concepts with appropriate support. Identify one strength and one specific suggestion for improvement. Provide feedback that is constructive, specific, and actionable.”

- Example Prompt 2: Response Posts

“Assess the student’s responses to peers. Were the replies timely, relevant, and meaningful? Identify one positive aspect and one recommendation for strengthening peer interaction. Comment briefly on the quality of engagement and how well the student contributed to the group discussion.”

Submission Preparation and AI Processing

The course included 17 discussion groups of approximately 12–13 students each. A lightweight script exported posts from the learning management system and organized them by group. Within each group, student names were removed and replaced with labels (e.g., “Student A”). For each student, the initial post and all response posts were compiled as a single text entry.

The AI tool processed one group at a time. For each group, the structured file was provided to the AI along with rubric-aligned prompts, and the AI generated a draft feedback block for each student. The instructor then reviewed and edited every comment to ensure accuracy, appropriate tone, and alignment with course expectations before returning feedback to students. This group-based batching allowed for efficient processing while maintaining individualized feedback quality.

Example of AI-Generated Draft Output

Before instructor editing, the AI generated concise draft comments aligned with the rubric criteria. The unedited example below illustrates the type of output produced before human refinement.

“Your initial post addresses the key aspects of the prompt and demonstrates a clear connection to the relevant course concepts. A particular strength of your response is the explanation of how digital tools supported the organization’s decision-making process, showing good awareness of the case context. To strengthen your analysis further, consider incorporating a more specific example or additional evidence to reinforce your claims and deepen the level of critical thinking. Your replies to peers were relevant and courteous, and they contributed positively to the discussion; however, they would be even more effective if you expanded more fully on classmates’ ideas or posed follow-up questions to encourage richer and more interactive dialogue.”

This type of draft feedback was refined by the instructor to ensure accuracy and clarity before sharing with students.

Data Collection

To evaluate changes in student perceptions before and after implementing the AI-assisted workflow, survey data were collected from two course sections: Fall 2024 (before implementation) and Spring 2025 (after implementation). Items were drawn from the university's standard end-of-course evaluation, which includes validated questions measuring clarity, respect, and instructor commitment to learning. Across semesters, the three-item scale demonstrated acceptable reliability ($\alpha = .82$).

Surveys were administered during weeks 14–15 of each term. Participation was voluntary and anonymous, and only aggregated, de-identified results were used in the analysis. Descriptive statistics, proportions of “Always/Often,” and Welch's t-tests were used to compare results across the two cohorts.

RESULTS

The AI-assisted dual feedback model incorporated individualized AI-assisted comments along with anonymized whole-class summaries that highlighted common strengths and recurring weaknesses. Students reported that this big-picture perspective helped them situate their own work within broader class patterns, reinforcing key learning objectives. By combining these two levels of feedback—personalized grading and collective reflection—the approach created a dual feedback loop that balanced efficiency with pedagogical depth.

Efficiency gains were considerable: grading time decreased by 65%—from 30 hours to 10.5 hours per cycle—while the average feedback length increased from 1–2 to 3–4 sentences, offering more actionable suggestions. Compared with prior studies of large-class teaching (Heidari and Pishvaei, 2022), this model delivered both workload reduction and richer feedback. In line with Nicol (2010) and Carless and Boud (2018), the findings indicate that AI can enable dialogic, actionable feedback at scale in large-enrollment business courses.

To assess the impact of the AI-assisted dual feedback model, the three tables compare student survey results from Fall 2024 (before implementation) and Spring 2025 (after implementation). The first set of results, presented in Table 1, highlights the proportion of students who responded “Always” to core items of clarity, respect, and commitment to learning. These most enthusiastic responses provide a high-bar indicator of student perceptions and reveal whether the strongest levels of agreement shifted across semesters.

Table 1: Student survey responses indicating the percentage of “Always” selections (5-point Likert scale) before and after AI-assisted dual feedback model implementation

Item	Fall count	Fall n	Fall %	Spring count	Spring n	Spring %
Clarity	19	41	46.3%	23	47	48.9%
Respect	27	41	65.9%	31	47	66.0%
Commitment	22	41	53.7%	29	47	61.7%

As Table 1 shows, the proportion of “Always” responses increased for Commitment to Learning (54% → 62%), Clarity (46% → 49%), and Respect remained stable at a very high level (66%). These results suggest that the most enthusiastic student responses improved slightly in Commitment to Learning and Clarity.

To broaden the picture beyond only the top category, Table 2 combines “Always” and “Often” responses. This composite measure better captures overall positive perceptions and allows a more practice-oriented assessment of how consistently students viewed the feedback and instruction favorably.

Table 2: Student survey responses showing the percentage of “Always” + “Often” selections (5-point Likert scale) before and after AI-assisted dual feedback model implementation

Item	Fall count	Fall n	Fall %	Spring count	Spring n	Spring %
Clarity	36	41	87.8%	38	47	80.9%
Respect	39	41	95.1%	45	47	95.7%
Commitment	36	41	87.8%	43	47	91.5%

As Table 2 illustrates, combining “Always” and “Often” gives a fuller view of overall positive perceptions. Respect and Commitment remained extremely high (95%+), with Commitment to Learning showing a small gain (88% → 92%). Clarity dipped slightly but remained strong at above 80%. This table provides the clearest summary for practice-oriented readers.

Finally, Table 3 presents statistical comparisons using means, Welch’s t-tests, and effect sizes to provide a more rigorous test of differences between semesters. This analysis moves beyond raw percentages to show whether observed changes are meaningful, and how strongly the dual feedback model may have influenced student perceptions of clarity, respect, and commitment.

Note, means are based on 5-point Likert coding (5=Always, 4=Often, 3=Sometimes, 2=Rarely, 1=Never). Δ = Spring–Fall mean difference. t = Welch’s t-test statistic. df = degrees of freedom. Cohen’s d = effect size (0.2=small, 0.5=medium, 0.8=large).

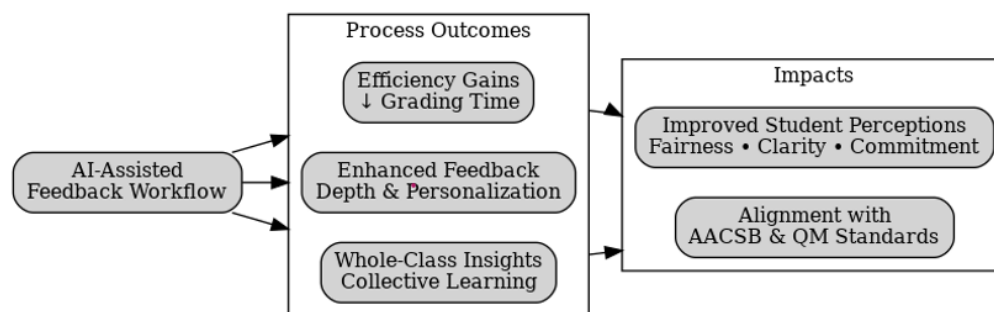
Table 3: Comparison of mean student survey responses across Fall and Spring cohorts with Welch’s t-tests and Cohen’s d effect sizes

Item	Fall n	Fall mean	Fall SD	Spring n	Spring mean	Spring SD	Δ	t	df	Cohen's d
Clarity	41	4.27	0.87	47	4.17	0.96	-0.1	-0.45	86	-0.11
Respect	41	4.56	0.77	47	4.62	0.61	0.06	0.38	80	0.08
Commitment	41	4.39	0.85	47	4.49	0.73	0.1	0.53	86	0.12

As Table 3 demonstrates, ratings across all items remained consistently high, indicating stable student perceptions of teaching quality. Importantly, Commitment to Learning improved modestly from Fall to Spring, showing a small positive effect (Cohen’s $d \approx +0.1$). Although small, these effects show that the AI-assisted dual feedback model, implemented in Spring 2025, preserved—and in some cases slightly improved—student perceptions in a large-enrollment course. Taken together, these results confirm that the model is not only an instructional innovation but also a structured mechanism for improving efficiency and teaching quality. Combined with qualitative evidence and major efficiency gains (65% reduction in grading time), the statistics provide credible support for the model’s effectiveness.

These findings align with two key frameworks: the Efficiency-Adoption-Confidence (EAC) perspective and the Quality Matters (QM) standards for course design. From the perspective of EAC, the dual feedback approach advanced three dimensions. Efficiency was achieved by reducing grading time by 65%, allowing faculty to focus more on refining feedback rather than repetitive drafting. Adoption was evidenced by stable-to-improved student perceptions, with survey responses and qualitative comments highlighting fairness, timeliness, and usefulness of the AI-assisted feedback. Confidence was strengthened through longer, rubric-aligned comments that clarified expectations and reinforced perceptions of instructor commitment to learning. Aligned with QM standards, the workflow implemented three core principles. Alignment was reinforced through rubric-based prompts tied directly to learning outcomes. Assessment and Measurement were enhanced by combining individualized grading with whole-class summaries, enabling both personalized evaluation and collective reflection. Feedback and Interaction - often a challenge in large courses - was improved through timely, actionable, and scalable responses that maintained quality while reducing instructor workload.

Figure 2: Conceptual framework linking the AI-assisted dual feedback workflow to Efficiency-Adoption-Confidence (EAC) dimensions and QM standards, showing process outcomes and broader impacts



Overall, the AI-assisted dual feedback model is both an instructional innovation and a practical way to advance efficiency and teaching quality at scale. Figure 2 summarizes this integration, illustrating how the workflow connects efficiency, adoption, and confidence with improved feedback quality and alignment to AACSB and QM standards.

DISCUSSION

The evidence demonstrates that the AI-assisted dual feedback model can relieve instructor workload while enhancing personalization in large-enrollment business courses. By situating results within the EAC perspective, this study shows how efficiency gains can coexist with adoption and confidence outcomes. Students reported improved perceptions of clarity, respect, and instructor commitment, aligning with Nicol (2010) and Carless and Boud (2018) on the importance of feedback that students can interpret and act upon. The integration of QM principles further highlights that AI can help instructors meet standards for course alignment, feedback quality, and facilitation (Shattuck, 2013; Lopez and Waller, 2020; Martin et al., 2022).

CONCLUSIONS

This study contributes both practical and theoretical insights into the role of AI in business education. Practically, it demonstrates how instructors can leverage AI to provide individualized and whole-class feedback at scale without compromising quality. Theoretically, it extends adoption research by positioning AI as an instructional support tool within the Efficiency-Adoption-Confidence (EAC) perspective. Limitations include reliance on one MIS course at a single institution and the need for replication in different contexts. Future research should examine longitudinal impacts, explore disciplinary differences, and assess how faculty development influences effective AI integration. Overall, the AI-assisted dual feedback model offers a scalable approach that balances efficiency with personalization, aligned with AACSB accreditation standards and QM rubrics. The approach provides a practical template that faculty in other business disciplines can adapt to large-enrollment settings. It highlights how generative AI can reduce workload while preserving instructional quality, opening the door for broader innovations in teaching and learning.

Practical Implications and Recommendations

The results of this study revisit the central challenge introduced at the start of the paper: in large-enrollment business courses, instructors often struggle to provide timely, meaningful, and individualized feedback at scale. The AI-assisted dual feedback model directly addresses this problem by reducing grading time substantially while sustaining the clarity, quality, and perceived fairness of feedback. Based on implementation lessons and student response patterns, several practical recommendations can guide instructors seeking to adopt similar AI-supported workflows:

1. *Design rubric-aligned prompts.* Anchor AI guidance in the same criteria used for grading to ensure clarity, consistency, and alignment with learning outcomes.
2. *Treat AI output as a draft.* Always review and refine generated feedback to correct inaccuracies, maintain instructor voice, and ensure appropriate tone.
3. *Batch work strategically.* Process submissions in manageable units (e.g., discussion groups) to preserve context while maximizing efficiency.
4. *Combine individualized feedback with whole-class summaries.* Reinforce common strengths and recurring misconceptions without repeating the same comments across students.

5. *Pilot the workflow before scaling.* Begin with one assignment and expand once prompts, formatting, and workflow logistics are refined.

These practices illustrate how AI can function as a reliable instructional support tool that enhances—rather than replaces—faculty judgment. When thoughtfully implemented, the AI-assisted dual feedback model enables instructors to deliver richer, more timely feedback in courses where scale often limits personalization. Together, these insights show that well-structured AI support can meaningfully improve feedback practices in large business courses, offering a sustainable model that other instructors and institutions can adapt.

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Teaching the Four Functions of Management Through the Lens of Sustainability

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ABSTRACT

This teaching paper presents an innovative, classroom-ready framework for integrating sustainability into the traditional Four Functions of Management—Planning, Organizing, Leading, and Controlling—within undergraduate Principles of Management courses. Rather than treating sustainability as a standalone or peripheral topic, the framework embeds sustainability directly into core managerial concepts, positioning it as an essential component of everyday managerial decision-making. Using well-established global companies, the paper includes four timeless mini-cases, structured classroom activities, instructor reflection tools, and student assessment instruments designed for immediate adoption. The module enables students to explain how each management function contributes to sustainable business practices, analyze sustainability initiatives across global firms, evaluate tensions among financial, environmental, and social objectives, and apply management concepts to design sustainability-focused solutions. By linking foundational management theory to real-world sustainability practices, this approach offers a practical teaching innovation that supports faculty efforts to integrate societal impact and ethical leadership into core business education.

Keywords: Sustainability, Management Education, Teaching Framework, Four Functions of Management, Corporate Responsibility

INTRODUCTION

Teaching Context

The challenge of managing organizations sustainably has become central to contemporary business practice. As global corporations respond to the pressures of climate change, resource scarcity, and stakeholder expectations (Hansen & Schaltegger, 2016), management educators have the opportunity — and responsibility — to prepare students to lead with sustainability in mind.

Despite growing consensus that sustainability is strategically important, organizations continue to struggle with implementation. The MIT Sloan Management Review and Boston Consulting Group’s multiyear research concludes that corporate sustainability has reached a “crossroads,” in which only a minority of organizations have developed leaders capable of embedding sustainability into strategy, operations, and decision-making. While a small group of standout firms demonstrate that sustainability can drive innovation, efficiency, and long-term value creation, most organizations lack the managerial capability to move beyond isolated initiatives or symbolic commitments (Kiron et al., 2017).

This gap points to a broader leadership and capability deficit rather than a lack of awareness or intent. The same research identifies one of the most critical drivers of successful sustainability outcomes as the ability to embed sustainability organizationally through cross-functional teams, clear targets, and performance metrics. However, these integration challenges require managers across functions—not only sustainability specialists—to understand how sustainability connects to core management responsibilities. Many business schools, by contrast, continue to treat sustainability as a specialized or elective topic, reaching only a subset of students who self-select into sustainability-focused courses.

As a result, students in disciplines such as accounting, finance, marketing, operations, and management may graduate without a shared conceptual framework for understanding sustainability as a core managerial responsibility. This creates a misalignment between organizational needs and management education outcomes. If organizations require broadly trained managers capable of integrating sustainability across functions, then sustainability must be taught early and broadly within the core management curriculum rather than confined to electives or advanced coursework. This teaching gap motivates the present paper’s approach: embedding sustainability directly into the Four Functions of Management to prepare a wider population of future managers for cross-functional sustainability leadership.

Undergraduate *Principles of Management* courses traditionally introduce students to the four core functions of management: **Planning, Organizing, Leading, and Controlling**. This teaching framework extends those functions by linking them to sustainability principles, demonstrating that managerial effectiveness includes social, environmental, and economic responsibility.

Many introductory management courses introduce sustainability as a standalone topic or in conjunction with ethical decision making. The disconnect between core management concepts and sustainability may lead students to undervalue sustainability or view it as optional, rather than an integral part of daily managerial decision making.

Because *Principles of Management* is one of the most widely taught courses across business schools, this module also serves as a practical resource for institutions seeking to meet the AACSB's **Societal Impact Standard**. By integrating sustainability into foundational management education, faculty can document how their teaching contributes to positive societal outcomes and aligns with accreditation goals that emphasize ethical leadership, global awareness, and responsible decision making (Fairfield, 2018).

The framework and accompanying materials are designed for instructors who wish to embed sustainability into existing management courses without requiring major curricular redesign.

PEDAGOGICAL FRAMEWORK: MANAGING FOR SUSTAINABILITY THROUGH THE FOUR FUNCTIONS OF MANAGEMENT

Purpose: To provide undergraduate management students with a clear, applied understanding of how sustainability aligns with core managerial responsibilities and to build critical thinking, ethical reasoning, and systems awareness.

The companies selected for the mini-cases—**Patagonia, Unilever, Microsoft, and Interface Inc.**—were chosen deliberately to support the pedagogical goals of the module rather than to showcase exemplary sustainability performance alone. Each organization represents a well-documented, recognizable example of sustainability embedded within core management practices, allowing students to connect abstract management concepts to real-world organizational decisions.

Patagonia, Unilever, and Microsoft were selected as globally recognized multinational organizations operating in different industries, providing industry diversity while ensuring the availability of credible, publicly accessible sustainability data. Their scale and visibility make them particularly effective for undergraduate learners, who are often familiar with these firms and can readily observe how sustainability initiatives intersect with planning, organizing, leading, and controlling across complex organizational systems. These firms also demonstrate how sustainability can be integrated across functions rather than isolated within a single department.

Interface Inc. was intentionally included as a regional organization to illustrate that sustainability leadership is not limited to global corporations. As a U.S.-based firm with a strong sustainability legacy, Interface allows students to see how the same management principles apply at different organizational scales and geographic contexts. Including a regional company reinforces the idea that sustainability integration is relevant to organizations of all sizes and locations, not only multinational enterprises.

Learning Objectives

Upon completion of the module, students will be able to:

- Explain how each management function contributes to sustainable business practices.
- Identify and analyze sustainability initiatives from global firms.
- Evaluate the tensions between financial, environmental, and social objectives.
- Apply management concepts to design sustainability-focused solutions.

Planning for Sustainability: The Case of Unilever

Concept focus: Strategic planning integrates sustainability by setting long-term goals that balance people, planet, and profit (Wheeler, 2013).

Mini case: Unilever's Sustainable Living Plan launched in 2010 established measurable goals to decouple company growth from environmental impact. The plan focused on sustainable sourcing, health and well-being, and improved livelihoods across its global supply chain. By embedding sustainability into its core strategy, Unilever demonstrated that environmental and social goals can coexist with shareholder value creation.

Discussion questions:

- How does Unilever's planning process align long-term sustainability goals with short-term performance expectations?
- Which management tools (e.g., SWOT, scenario planning) can be integrated to promote sustainability?
- What are the challenges of setting measurable sustainability targets?

Classroom activity: Students create a two-page Sustainability Action Plan for a local business, identifying one measurable objective for People, Planet, and Profit.

Resources

- Video: *How we're making sustainable living commonplace* (YouTube)
<https://www.youtube.com/watch?v=gZl1Y5O2f44>
- Playlist: *The Unilever Sustainable Living Plan*
https://www.youtube.com/playlist?list=PLncvI6F_uW_pGz-kaNbIILQE4JJucAKbH
- Press release: Unilever celebrates 10 years of the Sustainable Living Plan
<https://www.unilever.com/news/press-and-media/press-releases/2020/unilever-celebrates-10-years-of-the-sustainable-living-plan/>

Organizing for Sustainability: The Case of Patagonia

Concept focus: Organizing for sustainability entails establishing structures and cultures that align with ethical and environmental objectives (Kiron et al., 2017).

Mini case: Patagonia's mission — "We're in business to save our home planet" — drives its decisions from supply chain design to ownership structure. The company donates profits to environmental causes and maintains radical transparency in materials sourcing. Its culture of activism empowers employees and reinforces a shared sense of purpose.

Discussion questions

- How does Patagonia's organizational structure support its mission?
- What cultural practices reinforce sustainability values?
- How might other companies replicate Patagonia's approach without losing profitability?

Classroom activity: Students sketch an Organizational Chart for Sustainability, assigning roles and responsibilities for sustainability-related initiatives in a fictional company.

Resources

- Case study PDF: *Patagonia's Path to Carbon Neutrality by 2025* (Berkeley Haas)
<https://cases.haas.berkeley.edu/assets/documents/patagonia-preview-2018.pdf>
- Website: *Patagonia's history of corporate & social/environmental responsibility*
<https://www.patagonia.com/our-footprint/corporate-social-responsibility-history.html>
- Video: *Patagonia Story - Planet Over Profit* (YouTube, short format)
<https://www.youtube.com/shorts/> (search "Patagonia Sustainability Mission - Planet Over Profit")

Leading for Sustainability: The Case of Microsoft

Concept focus: Leadership is critical in translating sustainability goals into action and inspiring organizational change (Scott, 2013).

Mini case: Microsoft's leadership under CEO Satya Nadella exemplifies transformational sustainability leadership. The company's goal to become carbon negative by 2030 aligns with innovation in cloud infrastructure, renewable energy investment, and ecosystem partnerships. Nadella's emphasis on purpose-driven leadership demonstrates how sustainability can be integral to competitive strategy.

Discussion questions

- What leadership traits are most effective in promoting sustainability?
- How does Nadella's leadership illustrate transformational change?
- How can leaders overcome resistance to sustainability initiatives?

Classroom activity: Students role-play a meeting between executives debating whether to invest in a costly sustainability initiative, arguing both financial and ethical perspectives.

Resources

- Blog post: Microsoft will be carbon negative by 2030
<https://blogs.microsoft.com/blog/2020/01/16/microsoft-will-be-carbon-negative-by-2030/>
- Video: *Microsoft CEO Satya Nadella on Microsoft's Commitment*
<https://www.youtube.com/watch?v=LeQxTI-s48A> YouTube
- Video: *Explainer: Understanding the Math Behind Microsoft's Carbon Negative by 2030*
<https://www.youtube.com/watch?v=wj0UrF2T130>

Controlling for Sustainability: The Case of Interface Inc.

Concept focus: The control function ensures sustainability goals are measured, monitored, and aligned with performance metrics (Schaltegger, 2011)

Mini case: Interface Inc.'s Mission Zero initiative sought to eliminate the company's negative environmental impact by 2020. The firm utilized a Sustainability Balanced Scorecard to monitor progress across waste reduction, energy usage, and product design. Transparency and regular reporting created accountability across all levels of the organization.

Discussion questions

- How do sustainability metrics differ from traditional financial metrics?
- What are the benefits of using a balanced scorecard approach?
- How can continuous measurement improve long-term sustainability performance?

Classroom activity: Students design a simple Sustainability Dashboard with three key indicators for tracking a company's sustainability performance.

Resources

- Film: *Beyond Zero* (about Interface's transformation)
<https://www.youtube.com/watch?v=r8DMYy3-nNY>
- Overview: *Interface's climate commitment & sustainability history*
<https://www.interface.com/US/en-US/sustainability/sustainability-overview.html>
- Report: *Interface "Mission Zero" booklet*
https://www.interface.com/content/dam/interfaceinc/interface/sustainability/emea/25th-anniversary-report/Interface_MissionZeroCel_Booklet_EN.pdf

Optional Teaching Extension

To further enhance experiential learning, instructors are encouraged to adapt the mini cases by asking students to identify a local or regional organization that aligns with one of the Four Functions of Management. Similar to the

inclusion of Interface Inc. in this module, this adaptation allows students to apply management concepts to organizations within their own communities, strengthening relevance and engagement. This flexibility supports course customization while reinforcing the central learning objective: sustainability is a managerial responsibility that cuts across functions, industries, and organizational contexts.

TEACHING NOTE

Course Level: Undergraduate Principles of Management

Teaching Goals: Link traditional management theory to modern sustainability challenges, reinforce ethical reasoning and systems thinking, and provide a practical, adaptable framework for classroom use.

Session Structure (50–75 minutes): Brief lecture, case discussion, group activity, and reflection.

Estimated Preparation Time: 60-90 minutes for initial implementation; however, future sessions preparation time will be reduced as the materials are reusable and scalable.

Instructor Skill Requirements: Designed for faculty with introductory level knowledge of sustainability practices. No specialized sustainability experience is required.

Class Size: Best suited for small to medium-sized classes (20-50 students). For larger sessions, may want to use breakout groups to facilitate more robust discussions.

Assessments: Include Reflection journals, group project presentations, participation, and case discussions.

Pedagogical Value: This framework updates foundational management instruction for 21st-century challenges, empowering students to see themselves as sustainability leaders.

STUDENT REFLECTION AND ACTIVITY TOOLS

Pre-Module Reflection

- What does “sustainability” mean in a business context?
- Which management functions best align with sustainability?

Integrative Project

Groups select a company and apply the four management functions to design a sustainability strategy, culminating in a presentation or a brief report.

Post-Module Self-Assessment

- I can connect sustainability to each management function.
- I understand how sustainability affects organizational strategy.
- I feel confident applying sustainable management concepts in my career.

Optional Essay Prompt

Analyze a company’s sustainability efforts using the four functions of management. How could leadership improve long-term impact?

INSTRUCTOR QUESTIONNAIRE

Designed for self-assessment and course reflection.

- Which management functions currently receive the most attention in your teaching?
- How often do you integrate sustainability examples or cases?
- What teaching strategies are most effective for sustainability topics?
- What challenges arise when linking sustainability to management functions?

- After using this framework, how will your course assessments or content change?

CONCLUSION

Integrating sustainability into the traditional Four Functions of Management transforms a familiar foundational framework into a forward-looking teaching innovation. Rather than positioning sustainability as a specialized or elective topic, this module embeds sustainability directly within Planning, Organizing, Leading, and Controlling—core concepts taught early and broadly in business curricula. In doing so, the framework addresses a critical gap in management education by preparing a wider population of future managers to engage with sustainability as an integral managerial responsibility rather than a peripheral concern.

The classroom-ready framework, supported by concise mini-cases and applied learning activities, provides instructors with a practical and scalable approach for incorporating sustainability into introductory management courses without requiring curricular redesign or specialized expertise. By linking management fundamentals to real-world sustainability challenges across organizational contexts, the module fosters active learning, critical reflection, and ethical awareness while reinforcing the cross-functional nature of sustainability in contemporary organizations. Teaching sustainability through management fundamentals not only deepens students' understanding of managerial decision-making but also equips them to view organizations as agents of long-term social, environmental, and economic value creation.

Future research may build on this teaching framework by systematically examining student learning outcomes, engagement, and cross-functional understanding of sustainability concepts as the module is implemented across different courses, institutions, and disciplinary contexts.

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Modernizing the Business Core Curriculum at a Small AACSB Accredited Liberal Arts College

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ABSTRACT

Business schools face increasing pressure to modernize curricula in response to evolving accreditation standards, employer expectations, and rapid technological change. This paper presents the redesign of the Business Core at Stonehill College's Meehan School of Business, a small, AACSB-accredited liberal arts institution. Guided by benchmarking, a structured skills gap analysis, AACSB consultation, and broad faculty engagement, we restructured the core to streamline requirements and align learning more intentionally with workforce needs. A central innovation of this redesign is the Meehan Professional Pathways Program, a flexible, co-curricular, point-based model that develops competencies such as technology fluency, self-management, strategic thinking, and career readiness beyond the classroom. This case provides a practical and scalable framework for similarly sized institutions seeking to balance academic rigor, flexibility, and professional preparation with limited resources.

Keywords: business education, curriculum redesign, AACSB accreditation, skills gap analysis, experiential learning

INTRODUCTION AND PURPOSE

Undergraduate business programs continually revise their curricula for a variety of reasons, including shifts in accreditation standards, the need for greater student satisfaction and retention, and changing employer needs. Employers are increasingly demanding soft skills such as strong analytical thinking, effective communication abilities, adaptability, and ethical leadership. Furthermore, as big data, blockchain, artificial intelligence, and digital platforms continue to transform organizations, business curricula must evolve to include digital fluency, data analytics, and comprehensive digital strategy. This is pushing schools to update course offerings accordingly (Ritter et al., 2018). Many schools are now focusing on developing students who possess both technical knowledge and essential soft skills. For example, the BBA program at Baruch College's Zicklin School of Business underwent a curriculum redesign because of employer feedback that emphasized data analytics, data fluency, technology literacy, as well as communication and interpersonal competencies (Fay, 2020). Taken together, these trends highlight the urgency for institutions, particularly smaller, teaching-focused ones like Stonehill College, to critically reassess and redesign their core business curricula in response to the demands of today's marketplace.

The purpose of this paper is twofold. The first is to add to the corpus of knowledge on curriculum revision methods and best practices. The second is to provide an illustrative case of a type of institution often underrepresented in the literature. Most existing studies on curricular redesign focus on large research universities,¹ whereas this paper highlights the experience of Stonehill College's Meehan School of Business, a small, teaching-focused institution. Therefore, this paper represents a unique contribution to the existing comprehension in this area.

AACSB CONTEXT

The Association to Advance Collegiate Schools of Business (AACSB) accrediting body is another force shaping business curriculum revision. Undergraduate business programs must reassess their core courses frequently and align them with AACSB accreditation-criteria, employer expectations, and new professional competencies such as technological fluency (Barr, et al., 2020). AACSB pushes institutions to review their learning goals while adding fundamental workplace competencies to their programs (Barr, et al., 2020).

In that context, colleges and universities have begun adding practical hands-on learning experiences to their academic programs. For example, American University's Kogod School of Business redesigned its curriculum so that students work on realistic business challenges during their first year (American University, 2024). Responding to both employer expectations and societal demands, University of Minnesota's Carlson School of Management started to integrate topics such as sustainability, ethical leadership, data and technology, and critical thinking into its revised

business curriculum, along with real world projects and experiences (Carlson School of Management, 2023). Further, there is increased focus on ensuring inclusive and equitable quality education, a UN Sustainable Development Goal promoted by AACSB. These developments illustrate a transformation in business education, from one of simple knowledge transfer towards a more competence-based approach, which focuses on knowledge, skills and attitudes necessary to prepare students for employment (Bratianu et al., 2020).

BACKGROUND AND MOTIVATION

Background Information. The Meehan School of Business is an AACSB accredited business school within a small (approximately 2,500 students) liberal arts college.² It provides rigorous business training alongside a broad classical liberal arts education, including humanities, arts and science. In line with the Holy Cross' mission, this liberal arts based education is intended to educate the "whole person", including strengthening essential skills such as critical thinking (Dumitru, 2019), writing, and ethical reasoning, but importantly, the humanities help students become more comfortable dealing with complexity, uncertainty and ambiguity (Mejia & Aronstein, 2022), all hallmarks of our rapidly changing social, political and economic environments.

In addition to this General Education Core required of all students, each of the nine business majors³ consists of 20 courses, including a substantial "Business Core" of 14 courses that cover the fundamental areas of business. The remaining six courses focus more deeply in the specific major discipline. The purpose of this model is two-fold. First it provides a broad business foundation in addition to specialized education. Second, the relatively large common Business Core provides students with flexibility to change majors further into their college degree. This blend of rigorous business training and liberal arts foundation, delivered at a smaller scale than most AACSB-accredited institutions, provides a unique and underrepresented perspective in the literature on curriculum redesign. Having outlined the broader context and literature, we now turn to our own case, describing the motivations and process behind revising the Meehan School of Business Core curriculum.

Our Motivation for Updating the Business Core Curriculum. Our undergraduate Business Core had not undergone a serious, comprehensive review in over a decade, about the time of our initial AACSB accreditation. Although there had been course-level updates since then, we had not revisited the larger purpose and structure of the core. We found ourselves asking essential questions: Was the curriculum still achieving what it was originally intended to do? Were our students receiving the foundational knowledge, skills and experiences they needed? Were we offering the right mix of topics to support a modern, well-rounded business education?

At the same time, we recognized that the expectations of our students had evolved. Increasingly, students are looking for courses and experiences that support their career goals and help them stand out in the job market. While schools continue to value the importance of core business competencies, they also see the need to augment them with applied, skill-based experiences that help students enter the workforce with confidence and the ability to differentiate themselves. This is reflected in the existing literature. For example, Ward and Grant (2019), describe how institutions like the University of Findlay are reimagining their business curriculum to reflect employer demands for real-world skills, certifications, and hands-on learning. Likewise, Kumar and Preiser-Houy (2024) discuss how integrated co-curricular initiatives, with a focus on experiential learning, can build critical competencies such as teamwork, leadership, and ethical decision making, while deepening student engagement and career readiness. Although our process and context were distinct, the same underlying themes of relevance, flexibility, and employability emerged in our own reflections. Informed by these trends and reflections, we embarked on a structured redesign process.

The Redesign Process. Our redesign strategy had two core components: a revised Business Core that reflects evolving academic and industry demands, and a complementary co-curricular pathways-type initiative, designed to address essential professional competencies not easily captured in traditional coursework. To tackle the challenge of a full curricular assessment and redesign, a committee ("Committee") was convened with faculty from each major. Including all disciplines was important to "integrate and coordinate" across majors (Ward & Grant, 2019, p. 52).

The Committee worked from the late spring semester and throughout the summer, and members were given a stipend for their work. The Committee's charge was to revise the Business Core and graduation requirements so that students graduate with the capabilities essential for success in the contemporary business world (both broadly and specific to their profession of interest) and a competitive resume that enhances their employability. To do this we used a process parallel to the skills gap analysis framework often used in Human Resources Management (SHRM, 2024; Surface, 2012; von Moltke, n.d.). While this is typically used in assessing how well a company's workforce's capabilities meet

its current and future needs it is flexible enough to apply to many situations, including the academic context. We largely address steps 1 – 3 here.

1. Identify where you want to be: Determine skills/competencies necessary to meet the school's goals
2. Determine the gaps between where you are and where you want to be: Determine current students' skills/competencies, and the gap from the necessary skills/competencies
3. Create methods to bridge the gaps in skills/competencies: Create new training or educational requirements to bridge those gaps
4. Implement the plan

STEPS 1 AND 2: DETERMINING THE GAPS

We used a variety of sources both inside and outside our institution to determine the “necessary skills” for successful business graduates. We were looking both for competencies we did not cover that we needed (gaps we needed to fill), and competencies we covered that we did not need (items we could cut).

Benchmarking. We reviewed Business Core curriculum from a range of institutions, including the top undergraduate business programs ranked by U.S. News as well as our own AACSB peer, aspirant, and competitive institutions. We compared the size and structure of the Business Core, the content areas emphasized, and whether schools were offering innovative or distinctive courses or features that we had not yet considered. While it was a useful exercise to explore programs at nationally ranked and aspirational institutions, we ultimately chose to focus our benchmarking on peer and competitive schools, those most like Stonehill in mission, size, and student population. This allowed us to make more meaningful and actionable comparisons that aligned with our institutional context and goals. This benchmarking exercise helped clarify how our curriculum aligned with, or distinguished us from, current trends in undergraduate business education. In addition to broad commonalities, we found two courses our peers required that we did not (data analytics and general technology skills) and a course we required but they did not (3-credit Introduction to Business). Further, some institutions required only one accounting course (we required two), and some required one or no economics courses (we required both micro and macroeconomics).

AACSB. The feedback from our AACSB pre-visit reaccreditation consultant team played an important role in shaping our analysis. As part of that consultation, we were strongly encouraged to modernize the curriculum to better reflect the evolving needs of business education. A key area of focus was data analytics as a core competency. The team recommended adding an introductory data analytics course to the Business Core as well as integrating analytics concepts throughout the curriculum. This guidance reinforced our own internal conversations and validated the need to treat analytics not as a specialization, but as a foundational competency for all business students.

Subject Matter Experts. We drew on the subject matter expertise of the faculty serving on the committee to interpret benchmarking data, apply AACSB guidance, and evaluate curricular possibilities within our specific institutional context. Their collective understanding of our college's mission, faculty strengths, and employer needs enabled us to synthesize this information and determine an appropriate direction for curriculum changes.

From these sources, we created our preliminary list of important skills/competencies.

Challenges. This process elucidated an obstacle in our curricular redesign. There are institutional constraints on the size of any major, so adding courses to the Business Core would likely require eliminating other courses. In addition, there was a tension within the business program between adding topics to the Business Core to cover gaps and streamlining the core to provide the majors more flexibility to add depth and focus to their major specific curriculum.

With that in mind, the Committee looked for (1) courses we could remove, (2) courses where we could consolidate two courses, and (3) courses we could remove from the Business Core but leave to the college-wide General Education Core requirement (i.e., students would still be required to take a course in the topic, but we would lose direct control of the content). Specifically, we explored combining two accounting classes and/or two economics classes, as well as removing a business specific statistics requirement and leaving it to the General Education Core requirement where students could take statistics in any discipline.

Additionally, the Committee thought it likely would take methods beyond curricular change at the course level to address the gaps we needed to fill. We researched and brainstormed various ways to address those gaps, both general

ways (e.g., add additional content to existing courses, require mastery sessions, require self-paced training, a programmatic combination of any number of these methods, especially a pathways type program), and some specific suggestions for particular gaps (e.g., broadening an existing leadership program to include all students).

Faculty Input & Buy-in. In our efforts to work collaboratively on this project, we experienced a tension familiar to those who have worked on a faculty committee. We attempted to strike a balance between including the broader faculty (keeping them informed and getting their input) and not overburdening them over the summer. At this point we felt their input was necessary, because in addition to wanting their expertise, we needed their buy-in. Involvement in creation of any initiative is critical for buy-in (Hubbart, 2023; Nwisagbo, et al., 2025), and faculty involvement is a key success factor in effective co-curricular programs (Kumar & Preiser-Houy, 2024), so we went to them for input in a very deliberate fashion.

Our efforts to strike that balance here may prove helpful to others undertaking similar curricular redesign. We were intentional about maintaining transparency, not only regarding the process itself, but also in explaining when and how we communicated with stakeholders. We made it clear that we were striving to gather meaningful input while also being mindful of faculty time over the summer months.

With that in mind, we opened with our first update email to the faculty with “This is not going to be a linear process, and we’ll do our best to keep you informed and get your feedback. While we want to avoid burdening people over the summer, we also want this to be an all of faculty process, so we appreciate your forbearance as we attempt this balance.” We also asked them to share any suggestions regarding how we could do this more effectively.

We spent considerable time ensuring that the information we conveyed was thorough but concise. Further, we made the way we asked for input as clear and efficient as possible, while also providing ways for faculty to give more feedback if they chose to.

To that end, we created a Progress Summary Report (PSR) along with a corresponding survey to structure the process of getting their feedback. The PSR included 5 sections:

1. Structured summary of the steps the Committee had taken, general topics we had addressed, and unresolved issues
2. Review of benchmarking core curricula at peer institutions at the course level, highlighting what other institutions required that we did not, as well as what we required that others did not.
3. Committee’s ideas on how to reduce/streamline the Business Core
4. List of the skills/content we believed were missing from the Business Core (“skill gaps”)
5. Preliminary list of potential means to fill the skill gaps

The survey questions asked for specific types of feedback on specific aspects of the PSR (essentially a structured walk through the document). Broadly speaking, we asked faculty for their feedback on what we had done, and for anything we had missed. The core feedback we asked for:

- Regarding #2 & #3: Feedback on potential curriculum changes, courses they thought should be added, cut, or streamlined.
- Regarding #4: Most critical and least critical skill gaps; Missing skill gaps? Any skill listed as a gap actually already covered in current core course?
- Regarding #5: Any existing courses that could be adapted to cover gaps? Feedback on preliminary list of means and any additional means that could be added.

The questions were open response, which allowed for as much or as little commentary the faculty member chose to give. There were also questions asking for feedback on anything that was not addressed. The full survey can be found in Appendix A).

We coded the results to determine if there was adequate support for adding, removing, or combining courses, what the faculty viewed as the most/least critical skill gaps, skill gaps we missed, and suggestions for additional means to address the gaps. We also added to our lists the additional skill gaps and suggestions for means to fill them. The results were:

- There was broad consensus that a data analytics course needed to be added
- There was some coalescence around merging two course requirements for Economics and Accounting into one course each, but there was no real consensus.
- There were several additional skills that needed to be added to our gap list

STEP 3. REVISING CURRICULUM TO ADDRESS SKILL GAPS

From there, the Committee worked on revising Business Core requirements. We did this considering the feedback from the faculty, initiating more in-depth discussions with other faculty who had relevant expertise, and continued discussions amongst the Committee, including further reviews of higher education literature.

We determined that there was overwhelming support from every source to add data analytics to the Business Core. There was not sufficient support to recommend removing any course or consolidating any two courses. However, we did remove business statistics from the Business Core requirements, deciding to rely on the General Education Core “statistical reasoning” requirement to cover that content, trading off some control over content for more space in the Business Core.

The new Business Core curriculum was approved by the full department and the appropriate committees and launched in the Fall of the next year. The original and revised Business Core can be found in Appendix B.

Additionally, Microsoft Excel skills were widely believed to be a critical skill gap that needed to be addressed. An initiative had been launched in the prior year where excel training and testing would be required to graduate. Excel training and testing began in the 2022–2023 academic year as a pilot requirement. By the Class of 2026, three levels of proficiency testing became mandatory. We expected to continue that initiative and to roll it into whatever program we created.

The faculty feedback confirmed for the Committee that we could not address all the critical skill gaps through curricular change at the course level alone. As discussed above, the footprint of each major couldn’t get larger, so adding to the Business Core would come at the expense of courses in the specialized majors, which was not tenable. We were only able to free up space to add data analytics by moving statistics out of the Business Core. Additionally, many of the skills were non-disciplinary skills that did not have an obvious home in any course. Indeed, based on its extensive employer surveys, the National Association of Colleges and Employers reports that the soft skills employers find important are the type not usually learned in the classroom (Kamenetz, 2015; Peck et al., 2015; Peck, et al., 2016), a view with which the Committee concurred.

In response, we developed a complementary initiative: the Meehan Professional Pathways Program (Meehan Pathways). It had been included as a conceptual option in Phase 1 and was met with broad faculty support. Meehan Pathways became the primary vehicle through which we sought to embed these essential, career-oriented skills into the student experience in a scalable, flexible, and personalized way. What follows is a detailed overview of how we structured, implemented, and integrated this program into the broader curriculum.

PHASE 2: COMPLETING STEP 3 VIA MEEHAN PATHWAYS PROGRAM

In its second phase, the Committee’s goal was to (1) develop a definitive list of important skill gaps that had not been resolved in Phase 1, (2) determine the structure of a passport type system to address those gaps, and (3) create menus of activities that would count towards each skill. This initiative became Meehan Pathways.

Developing List of Skill Gaps to be Addressed. Starting with the skill gaps from the Progress Summary Report (except data analytics), the list was modified based on the faculty survey and Committee discussions, we eliminated several skills for various reasons (e.g., they were widely deemed to be of lesser importance, Meehan Pathways was not an appropriate venue to address them, or simply because of resource constraints). The Committee also examined whether any additional skills that should be considered. We added a few, notably, Artificial Intelligence had not been included on the list in the summer of 2023, but its usage and pervasiveness grew exponentially during that next academic year, so was on most educators’ minds by the summer of 2024.

Structure of Meehan Pathways. Even after narrowing the list, it still included 26 items, making it impractical for students to complete a separate task for each individual skill. The Committee determined that most items could be

clustered into one of several overarching competency groups, and that completing a subset of the skills within each hub would be sufficient to address that competency. This would allow students to choose particular skills that they wanted to develop, thus providing them the flexibility to chart a path that suited their interests and career aspirations. A management faculty with some expertise in competency modeling made the first pass clustering the skills, and then the full Committee came to consensus. This resulted in 5 “Skill Hubs” and two “Professional Milestones”.

Skill Hubs:

1. Technology Mastery
2. Self-Management
3. Career Navigation
4. Strategic Thinking
5. Managing People & Relationships

Professional Milestones:

- A. Professional Certification
- B. Internship Experience

Our goal in having students engage with all of these areas was to develop both strong expertise and practical experience, equipping them with a versatile toolkit of transferable skills. Further, the Committee determined that some particular skills were essential and needed to be required for all students rather than be an option amongst several. These particular skills were also time sensitive in that they needed to be addressed at a certain point in their college career to have the intended impact. For example, study skills, time management, and basic career exploration (e.g., onboarding with the career development office) are required in the first year. These skills were broken out from the Skill Hubs and became the “Core Foundations Requirements” (comprised of Technology Essentials, Academic Essentials, Career Essentials, and Information Essentials). To ensure consistency for these essential skills, a number of these are built into the freshman intro course, some built into Cengage training and testing, and some training will be offered in partnership with offices on campus (e.g., career development and the library). See Appendix C for the full Meehan Pathways model, including skills that comprise each Skill Hub.

Skill Acquisition Methods for Satisfying Hubs. In determining how students could satisfy the requirements within each of the Skill Hubs, flexibility was very important to us. We recognized that students could acquire a competency in a number of ways and worked to provide a variety of options. These included: completing a traditional for-credit course, training seminars, student leadership roles within clubs or organizations, participating in campus lectures, professional events, academic talks, and other activities.

We also recognized that students would benefit from additional professional development resources beyond what currently exists at Stonehill. In exploring external options, we considered a range of online learning platforms such as Coursera, LinkedIn Learning, EdX, Udemy, and others. These platforms offer skill-based courses, often aligned by design with what employers are seeking, which aligned with the goal of Meehan Pathways. This range of options provides the opportunity for students to personalize and tailor to their interests and learning style. However, students’ ability to access these platforms could vary widely depending on pricing models and institutional support (discussed in more depth below).

To allow for these very diverse options to be utilized, student progress in Meehan Pathways would be assessed using a point-based system, where different experiences and options within each Skill Hub carry distinct point values. Options that are more involved and time-consuming receive more points, thus removing the challenge of trying to find options that were similar in the effort required.

The cumulative points earned in each Hub indicates their level of achievement, which is categorized (from lowest to highest) as Exposure, Interaction, Proficiency, Expertise, and Mastery. To successfully complete the program, students must achieve at least the Proficiency level in all Skill Hubs, and the Expertise level in at least one.

This structure met our goals of ensuring students have the core professional skills they need to be marketable and successful, while providing students the flexibility to focus more in an area that aligns with their desired career path, and to choose learning experiences that fit their interests and learning style. Additionally, giving people the autonomy to choose how they meet a goal is known to enhance intrinsic motivation which results in deeper engagement and greater learning (Cullen & Oppenheimer, 2024; Deci & Ryan, 2008).

In order to create menus of options, the Committee allocated the skills according to faculty interest and expertise. Faculty then spoke to other subject matter experts and did research into possibilities to come up with multiple options for each skill for students to choose from. In addition to choosing from the list, students are able to petition to have an unlisted activity count as a Meehan Pathways item. Likewise, faculty can petition to have a course, workshop, or other activity included as a pathway option.

Challenges – Resources for Management, Logistics, and Tracking. An essential component of any Meehan Pathways type program is ensuring that students' progress is managed and tracked within a central repository. Some institutions have built internal systems (Lapidus, et al., 2015) or adapted their existing learning management systems for this purpose. For smaller institutions with fewer resources, creating a system in-house may not be feasible, so external vendors may provide a solution. As we considered our options, an external vendor was the path we chose.

Our priorities in choosing a system were: We needed a system that was customizable to the way Meehan Pathways was structured, including being able to count points earned within each Skill Hub and indicate when the Hub (or other category) was completed. We also needed a system that allowed us to include a wide range of activities, from traditional classes to co-curricular activities to student leadership positions etc., all in one centralized place, and map them on to the specific Skill Hubs or requirements. Further, we wanted students to be able to see their progress in real time and, as far as possible, be able to report and provide verification of completion of activities themselves.

To that end, we evaluated Suitable's *Guided Pathways* software, a customizable platform designed specifically for tracking and managing cocurricular and experiential learning. The platform could do all the things listed above, and also can automate assessments, issue digital badges, and scaffold engagement over time, requiring students to complete some activities before moving on to others. The software also allowed students to upload proof of participation in activities in order to satisfy a specific requirement.

Beyond tracking, the software helps with student communication and engagement. Students receive real-time updates and reminders in a mobile app and can be notified about upcoming events or missing requirements. Gamification features, including badges, points, and leaderboards, help motivate progress and recognize student achievements along their path.

That said, while the flexibility and functionality of external systems are attractive, they can come with a substantial price tag. Institutions considering software like this must plan for these costs. In weighing the alternatives, manual logs versus purpose-built software, it's very important to consider not just affordability but also scalability, usability, and the potential to engage students as they complete the pathway.

Challenges – Equitable Access. Several of the options in Meehan Pathways are courses or other offerings on paid sites outside the institution. To ensure equitable access, we proposed that the cost of one or more of the professional learning platforms (Cengage, Coursera, etc.) be included in a campus student technology fee. Placing the financial burden on students (especially when access to these resources would be a key part of their development and necessary for completing their degree) would perpetuate inequity and be contrary to the College's mission. For costs beyond those covered in the technology fees (such as obtaining a professional certification), students are able to apply for professional development grants. For institutions pursuing similar programs, the decision to integrate outside resources should be approached with thought given to affordability and access.

CONCLUSION

As the landscape of business and higher education continues to shift, institutions must be agile in redesigning curricula that not only meet accreditation standards but also prepare students for the evolving demands of the workforce. This paper has detailed one such redesign process at a small AACSB-accredited institution, offering an illustrative case that may prove useful to other institutions, especially those outside the traditional research university context. By integrating data from benchmarking, accreditation guidance, and internal expertise, and by actively engaging faculty in transparent and collaborative ways, we developed a new Business Core and accompanying Meehan Pathways that together aim to provide students with both foundational business knowledge and the real-world competencies employers value.

Our process underscored the importance of balancing academic rigor with flexibility, theoretical grounding with

applied experiences, and institutional constraints with innovation. Meehan Pathways in particular represents a scalable model for embedding skill development and career readiness into the student experience, without requiring unsustainable curricular bloat. While our work is ongoing, we believe our approach demonstrates how even smaller institutions can enact meaningful curricular transformation rooted in mission, stakeholder input, and a commitment to student success.

FUTURE WORK

At the time of writing, the revised Business Core and the Meehan Professional Pathways Program are still in early implementation, so no post-implementation outcome data are yet available. While this paper focuses on design and execution, the next phase of this research will evaluate the impact of this redesign.

Over the next four to five years, as a full cohort of students completes both the revised core and the Pathways program, we will conduct an assessment of impact. This will include repeating the faculty survey on skills gaps as a post-measure of student competencies in areas such as data analytics, strategic thinking, technology fluency, self-management, and career readiness.

To strengthen validity, we will triangulate the faculty skills gap survey with data from a new student survey and structured input from employers who host Stonehill students in internships. Employer perspectives on student preparedness, workplace performance, and professional behaviors will provide an external lens on the effectiveness of the redesign.

A future version of this study will report these findings and offer evidence-based recommendations for smaller institutions pursuing similar curriculum redesign.

ENDNOTES

¹ Schools include American University (American University, 2024), University of Minnesota (Carlson School of Management, 2023), California State Polytechnic University (integration of co-curricular experiences) (Kumar & Preiser-Houy, 2024), Northern Illinois University (added Passport program) (Lapidus, et al., 2015), Stockton University (Barr et al, 2020), University of Pittsburgh (Davis, et al, 2022).

² Only about one third of AACSB accredited schools are small schools. Small is defined as fewer than 36 faculty in the business program. <https://www.aacsb.edu/accredited>

³ Accounting, Business Analytics, Finance, General Management, Global Business Operations & Strategy, Management Information Systems, Marketing, Sport Management, and Talent and Human Resources Management.

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BIOGRAPHIES

Hilary J. Gettman, JD, PhD, is a Professor of Management and Business Analytics at Stonehill College, and the Chair of that program. She teaches organizational behavior, negotiation and decision making, and managing diversity in organizations. Hilary has a J.D. from Harvard Law School and a Ph.D. in Industrial and Organizational Psychology from the University of Maryland College Park. Her primary interests include leadership development, executive coaching, organizational culture, gender harassment, and pedagogical issues including travel courses, curriculum development, and the acceptance and use of technology in the college context.

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Jennifer A. Swanson, PhD, is a Professor of Global Business, Operations & Strategy at Stonehill College. She teaches international business, international management, and special topics in international business. Jennifer holds a PhD in Management from the University of Rhode Island and has taught and trained at the undergraduate, graduate, and executive level in the U.S. and Southeast Asia. She has published in a wide variety of journals, served as President for Northeast Decision Sciences Institute, was on the Board for MicroLoan Foundation USA, participated in a China Fulbright-Hays Group Project, was Co-Director for a U.S. Department of Education grant on Canada, Ireland, and Portugal, participated in a COIL program team teaching U.S. and Bolivian students, and developed travel learning communities involving student travel to Europe, Africa, Central America, and Latin America.

APPENDIX A: FACULTY SURVEY QUESTIONS

Please read over the “Progress Summary Report” before answering these questions, and have it handy to refer to while answering.

You do NOT need to fill in every question. If you have nothing to add, or the content would be redundant with something you've already written, feel free to say so, or just leave the question blank.

Core Curriculum questions Please refer to the "Review of Core Curricula at peer institutions" list for these questions.

1. Are there courses you think we should ADD to the core requirements? Please explain.
2. Are there courses you would really like to ADD to your major requirements (outside the core) in order to improve your major/make your major what you want it to be? Please elaborate.
*Think beyond "it'd be nice to have" courses, but courses you think your majors should really be getting that you don't currently have room for.
3. Are there any of our existing core courses (in purple on the list) that you think students in your major really do NOT need to take? If you HAD to cut one, what would it be (note, you can cut one by combining two courses). Please give a brief explanation of your answer.
4. If you have any suggestions beyond what's in the document for cutting down or streamline the core curriculum, please list them here.

Skill / Topic Gaps Questions Please refer to the "Skill/Topic Gaps" list for these questions

5. Most critical gaps: Which (if any) of the list of skills/topics gaps do you think are *particularly critical* for business majors to graduate with?
All the skills are likely important in general, but we're looking for which skills you think are most essential for students graduating from an undergraduate business program to have. If you think they are *all* critical, please prioritize (e.g., split into 3 levels, or choose your top 5 or so, or rank order the whole list, etc.)
6. Least critical gaps: Are there any skills/topics on the list you think are NOT that important / not necessary for an undergraduate business degree? (I.e., it might be important broadly or important to develop for long term success, but not important specifically for an undergraduate business student)
7. Please list any skills gaps or topics you think are *missing* from this list here.

Means to Fill the Gaps Please refer to the "Potential means to fill skill/topic gaps" list

8. Are any of the skills/topics gaps listed actually already covered in an existing CORE course taught in your area? Please explain.
9. Are there any of the skills/topics listed that you think you could pretty easily *add* to an existing CORE class taught in your area? Please explain.
10. Please list any additional ideas you have for how we could address any of the gaps listed here (or gaps you've added).
*If you're not sure something would work, feel free to say that, but please mention the idea anyway.
*The ideas can be very specific (e.g., we could use X online program to cover Y skill) or more general (e.g., thinks along the lines of the "passport" idea).
*If you've seen something at another institution you think might work here, please mention it.
*Please be as creative and expansive as you can be here.
11. If you have any comments (good or bad) about the listed "means" please put them here

Other comments

12. Please put any comments that didn't fit into above questions here.

APPENDIX B: ORIGINAL AND REVISED CURRICULUM

Original Curriculum (Class 2025)

Taken Freshman Year

- BUS 101 - First-Year Business Experience (2 cr.)
- MTH 105 - Finite Mathematics (3 cr.)
OR
MTH 119 - Applied Calculus for Business (3 cr.)
OR
MTH 125 - Calculus I (4 cr.)

Typically taken Freshman or Sophomore Year

- BUS 203 - Financial Accounting (3 cr.)
- BUS 204 - Managerial Accounting (3 cr.)
- *BUS 206 - Quantitative Analysis (3 cr.)*
- ECO 176 - Microeconomic Principles (3 cr.)
- ECO 178 - Macroeconomic Principles (3 cr.)

Typically taken Sophomore Year

- BUS 333 - Organizational Behavior (3 cr.)
- BUS 340 - Marketing Principles (3 cr.)
- Excel Competency Exam - *Novice*: Required score of 80% or higher

Typically taken Junior Year

- BUS 320 - Corporate Finance (3 cr.)
- BUS 336 - International Business (3 cr.)
- BUS 352 - Legal Environment of Business (Writing in the Discipline) (4 cr.)
- BUS 360 - Operations Management (3 cr.) OR
BUS 308 - Decision Support Systems and Business Intelligence (3 cr.)
- Excel Competency Exam - *Proficiency*: Required score of 80% or higher

Taken Senior Year

- BUS 469 - Policy and Strategy (4 cr.)

Revised Curriculum (Class 2026 and beyond)

Taken Freshman Year

- BUS 101 - First-Year Business Experience (2 cr.)
- MTH 105 - Finite Mathematics (3 cr.)
OR
MTH 119 - Applied Calculus for Business (3 cr.)
OR
MTH 125 - Calculus I (4 cr.)
- *Excel Competency Exam - Novice: Required score of 80% or higher*

Typically taken Freshman or Sophomore Year

- BUS 203 - Financial Accounting (3 cr.)
- BUS 204 - Managerial Accounting (3 cr.)
- ECO 176 - Microeconomic Principles (3 cr.)
- ECO 178 - Macroeconomic Principles (3 cr.)

Typically taken Sophomore Year

- BUS 333 - Organizational Behavior (3 cr.)
- BUS 340 - Marketing Principles (3 cr.)
- Excel Competency Exam - *Proficiency*: Required score of 80% or higher

Typically taken Junior Year

- BUS 320 - Corporate Finance (3 cr.)
- BUS 336 - International Business (3 cr.)
- BUS 352 - Legal Environment of Business (Writing in the Discipline) (4 cr.)
- BUS 360 - Operations Management (3 cr.) OR
- Excel Competency Exam - *Mastery*: Required score of 80% or higher

Taken Senior Year

- BUS 469 - Policy and Strategy (4 cr.)

APPENDIX C: FULL PATHWAYS MODEL

CORE FOUNDATIONS REQUIREMENTS

All students are required to complete a set of foundational core pathway requirements with standardized method for addressing that competency and specified time of completion.

Knowledge Area	Competencies	Year of Completion
Technology Essentials	Basic Computing/Windows (Cengage)	First Year
	Microsoft Office Essentials (Cengage)	Sophomore
	Microsoft Excel (Cengage)	Senior
Academic Essentials	Time Management (Coursera and LinkedIn)	First Year
	Study Skills (Coursera and LinkedIn)	First Year
Career Essentials	LinkedIn Profile (MGT 101)	First Year
	Professional Headshot (MGT 101)	First Year
	Career Exploration Part I (MGT 101)	First Year
	Career Development Center Onboarding	First Year
Information Essentials	Information Literacy (Library Course)	Sophomore

SKILL HUBS

Students' progress in the Meehan Professional Pathways Program will be assessed using a point-based system, where different options within each Skill Hub carry distinct point values. Levels of achievement in each Hub will be determined by the cumulative points earned. The levels of achievement are categorized as Exposure, Interaction, Participation, Expertise, and Mastery, and the number of points necessary for each achievement level can varies by Skill Hub. To successfully complete the program, students must achieve at least the Participation level in all Skill Hubs, and a minimum of the Expertise level in at least one Skill Hub.

Self-Management Skill Hub

- Personal Finance
- Personal Technology Management
- Time Management
- Study Skills

Managing People & Relationships Skill Hub

- Communication
- Global Awareness
- Managing and Working with Diversity
- Emotional Intelligence
- Leadership
- Persuasion and Negotiation
- Teamwork

Strategic Thinking Skill Hub

- Creative Thinking
- Design Thinking for Innovation
- Foundations of Strategy

Tech Mastery Skill Hub

- Artificial Intelligence
- Cybersecurity

Career Navigation Skill Hub

- Career Direction
- Networking
- Job Search (resume, personal brand, interview)

Professional Milestones

- Significant Internship
- Professional Certification

Teaching Multicollinearity in Business Statistics: An Applied Approach Using Real-World Regression Models

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ABSTRACT

Multiple regression analysis is a core technique in business analytics and a standard topic in undergraduate business statistics courses. Yet students often struggle with conceptual challenges such as multicollinearity—an issue that can undermine both model interpretation and managerial insight. This paper explores strategies for teaching multicollinearity within a multiple regression framework using authentic datasets from real-estate and used-car markets. The approach combines visual diagnostics, spreadsheet-based modeling, and guided discovery to help students recognize and interpret multicollinearity rather than treating it as a purely statistical artifact. The paper synthesizes relevant literature on regression pedagogy to identify challenges associated with teaching this subject. Then, it illustrates a classroom-tested sequence that promotes conceptual understanding and applied reasoning. Student assessment results suggest improvement in recognition, interpretation, and remediation.

Keywords: multiple regression, multicollinearity, business analytics, data literacy, pedagogy

INTRODUCTION

Business schools face increasing pressure to equip graduates with the data literacy and analytical skills demanded by today's workforce. Career opportunities in data analytics have expanded dramatically, yet many undergraduates lack the quantitative preparation needed to succeed in data-driven roles. Many researchers have emphasized the importance of integrating data literacy into business curricula. They highlight competencies such as understanding data in context, evaluating data quality, interpreting and communicating results, and applying data ethically (Pothier & Condon, 2019; Pan et al., 2018).

Although these competencies provide a strong framework, business programs often have limited capacity to add new courses or expand quantitative requirements. As a result, existing courses in business statistics or data analytics must efficiently deliver instruction on a broad range of skills. Instructors face the dual challenge of addressing diverse student backgrounds while covering complex topics such as multiple regression. Though multiple regression and similarly challenging subjects are indispensable tools for business decision-making, they present subtle conceptual difficulties. In this environment, instructors must consider which pedagogical approaches and learning models are most effective for reaching a varied group of students.

Among these complex topics, multicollinearity stands out as both conceptually elusive and practically consequential. Many students can execute regression procedures in spreadsheets or software packages, yet they often struggle to recognize when correlated predictors undermine the reliability of model estimates. This paper responds to that pedagogical challenge. Drawing on prior research in data literacy and analytics education, it also presents classroom activities using real-estate and used-car pricing data that help students visualize, diagnose, and interpret multicollinearity in applied contexts. According to student assessment data, these strategies enhance student recognition, interpretation, and remediation, making them a valuable contribution to the literature on a subject that is rapidly growing in importance to the field of business analytics education.

LITERATURE REVIEW

Recent literature emphasizes student-centered and context-rich learning environments as the foundation for teaching multiple regression and its pitfalls—particularly multicollinearity. Researchers consistently advocate instructional approaches that “focus on how students learn rather than how teachers teach” (Wijetunga, 2012, p. 129).

A strong theme in the literature is the use of real-world data and case studies to make regression analysis relevant to students' experiences. Murray and Wilson (2021) reported positive outcomes when students engaged with regression using both R and an Excel add-in. Tucker et al. (2023) cautioned that introducing programming tasks too early can

overwhelm students and detract from conceptual understanding. Murray and Wilson (2021, p. 157) also noted a “dearth” of articles on teaching multiple regression, underscoring the need for more research into effective pedagogy.

The case study method remains one of the most widely used strategies for introducing regression. By engaging students with authentic business or social-science datasets, instructors can build both statistical and contextual understanding (Hanley, 2025). McIntyre (1994), for example, used cigarette brand data to illustrate collinear variables. This helped students “understand the importance of understanding the variables” (McIntyre, 1994, p. 2). Twenty years later, York and Wharton (2024, p. 201) similarly observed that beginning with manageable, real-world datasets helps reduce student anxiety and scaffolds learning before tackling larger, more complex problems.

Dataset selection is critical to the success of these methods. Smith (2011) highlighted potential “missteps” that students make in self-designed projects. These ranged from poor problem formulation to analytical errors, and emphasized the instructor’s role in structuring support (Smith, 2011). Dataset selection is one important way instructors can provide this support ahead of time. For example, Kuiper (2008) chose a Kelley Blue Book dataset on retail car prices—“a large, richly structured dataset” (p. 1)—to allow students to practice the entire process of model building and assessment. Other examples include student-run café data (DePaolo & Robinson, 2011), climate-change indicators (Witt, 2013), and Major League Baseball attendance figures (Cochran, 2002). These datasets were all designed to combine engagement with conceptual rigor. Effective datasets both challenge students and provide opportunities for exploration and problem-solving while remaining relatable to their lives and interests.

Technology has always played a prominent role in teaching regression. As early as Williams (1975), computing algorithms were designed to walk students through regression steps. More recent studies stress the need for balance. While tools can enhance learning, they can also intimidate students unfamiliar with programming (Al-Haddad et al., 2024). For example, Witmer (2023) argued that software simulations enable instructors to extend introductory courses toward more advanced concepts, such as logistic regression or power analysis, while maintaining accessibility for beginners.

Several scholars have likewise developed purpose-built instructional tools. Martin (2017) designed a spreadsheet environment to guide students in exploring regression diagnostics—including the F-test, *t*-tests, and multicollinearity—without requiring programming skills. Casement and McSweeney (2024) created an R-based application for generating datasets to support project-based learning. Ellis and Slade (2023) investigated the emerging role of AI tools such as ChatGPT in creating instructional materials. In their work, they cautioned instructors to anticipate students’ own use of generative AI as a learning shortcut (Ellis & Shade, 2023).

Because technology evolves rapidly, this literature highlights the need for continual pedagogical adaptation. AI-assisted teaching tools, evolving programming environments, and interactive spreadsheet models will likely define the next wave of regression pedagogy. Yet despite these advances, the underlying instructional challenge persists: how to help students build a conceptual understanding of how correlated predictors influence regression results.

The literature highlights several practical takeaways for instructors who teach multiple regression within business analytics curricula. First, regression topics can be particularly challenging for students who lack strong quantitative backgrounds but must apply analytics in professional settings. Therefore, effective pedagogy requires instructors to balance cognitive load with conceptual depth to prevent student frustration and disengagement. Second, student learning outcomes improve when complementary teaching strategies are combined. Examples include pairing spreadsheet or computing exercises with relatable, real-world datasets that emphasize relevance and agency. Finally, the research consistently underscores the importance of relevance to students’ lived experiences in activities as a way to enhance both motivation and comprehension. This is especially true when the case study method is used to contextualize abstract concepts. Future research might examine how instructors and students can collaborate in identifying what makes datasets engaging and accessible. This would allow them to build shared ownership in course design.

While numerous studies address strategies for teaching multiple regression, relatively few extend these strategies to the subtler issue of multicollinearity. Vaughan and Berry (2005) demonstrated that visually illustrating coefficient instability through a Monte Carlo exercise helps students grasp the concept. However, their work lacked empirical data on learning outcomes (Vaughan & Berry, 2005). Chen (2012) proposed the robust conjecture approach, which encourages students to use economic reasoning or business experience to identify reasonable model coefficients when multicollinearity arises. These contributions, along with Morrow-Howell’s (1994) assertion that the onset of

multicollinearity “varies according to the data at hand” (p. 249), underscore the importance of contextual and visual learning methods. The instructional framework presented here builds on that foundation by offering spreadsheet-based exercises that help students recognize, interpret, and mitigate multicollinearity in applied business contexts.

TEACHING APPROACH AND CLASSROOM IMPLEMENTATION

The teaching activities described in this paper were implemented at an AACSB-accredited regional public university. Business undergraduates complete a two-course statistics sequence emphasizing applied data analysis and business decision-making. Multiple regression is introduced during the second course as a culminating topic that integrates earlier material on descriptive statistics, correlation, and simple regression. Because students vary widely in mathematical preparation, instruction emphasizes intuition, visualization, and direct application using spreadsheet tools rather than statistical programming. Within this framework, multicollinearity provides a natural opportunity to help students transition from mechanical computation to analytical reasoning about model validity.

Real-Estate Regression Example

To introduce the concept, students analyze a regression model predicting *Selling Price* for residential real estate. The dependent variable is *Selling Price*, and independent variables include *Bedrooms*, *Bathrooms*, and *Total SqFt*. These variables are immediately meaningful to students, who intuitively understand that more bedrooms typically mean higher prices. When the model output reveals a negative coefficient for *Bedrooms*, students recognize a contradiction between statistical output and everyday reasoning. The instructor uses this moment to introduce the idea that correlated predictors can “step on each other’s toes,” distorting individual coefficient estimates. Table 1 presents an example of regression output that illustrates this phenomenon.

Table 1. Multiple regression output for real-estate data, illustrating a negative coefficient on *Beds*.

<i>Regression Statistics</i>						
Multiple R	0.88054					
R Square	0.77534					
Adjusted R Square	0.77278					
Standard Error	39794.37					
Observations	267					
ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	3	1.44×10 ¹²	4.79×10 ¹¹	302.56	0	
Residual	263	4.16×10 ¹¹	1.58×10 ⁹			
Total	266	1.85×10 ¹²				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-31269.69	7762.8066	-4.02814	0.000074	-46554.854	-15984.535
Beds	-6434.99	3043.4087	-2.11440	0.035422	-12427.533	-442.438
Baths	31499.81	4493.0382	7.01080	0.000000	22652.903	40346.711
Total SqFt	58.81	3.7894	15.51947	0.000000	51.349	66.272

Correlation Matrix

After discussing the unexpected negative coefficient, students are introduced to the correlation matrix as a diagnostic tool for detecting potential multicollinearity before or after running a regression model. The matrix displays pairwise Pearson correlation coefficients among all quantitative predictors, allowing students to see how strongly the explanatory variables move together. Instructors highlight that correlations exceeding roughly ± 0.50 signal

overlapping information that may distort coefficient estimates. By using conditional formatting or color shading in Excel or Google Sheets, students can instantly identify clusters of highly correlated variables, an approach that transforms a numerical table into a visual map of redundancy. This activity helps students recognize that multicollinearity is not a mysterious statistical flaw but a visible pattern of relationships among predictors, reinforcing the habit of examining correlations as a preliminary step in any regression analysis.

Table 2. Pearson correlation matrix showing strong positive correlations among predictors and with Selling Price.

	<i>Beds</i>	<i>Baths</i>	<i>Total SqFt</i>	<i>Selling Price</i>
Beds	1.000000			
Baths	0.641123	1.000000		
Total SqFt	0.587691	0.720970	1.000000	
Selling Price	0.518652	0.753287	0.856150	1.000000

Mitigation Strategies

Students then explore strategies to reduce the impact of multicollinearity. One approach is variable selection, where students iteratively remove predictors to evaluate how model performance and interpretability change. In the real-estate example, retaining only *Total SqFt* often produces a simpler and more coherent model. Through these exercises, students learn that addressing multicollinearity involves judgment as well as computation—decisions that must balance statistical rigor with business relevance.

A second approach uses composite or ratio variables. For example, students can create a single “size index” by standardizing and averaging *Total SqFt*, *Bedrooms*, and *Bathrooms*, or construct *SqFt per Bedroom* to separate overall size from room count. These transformations often stabilize coefficient estimates and can add interpretive clarity, illustrating that multicollinearity sometimes reflects overlapping ways of describing the same underlying feature. Students are also shown that interaction terms are primarily tools for modeling joint effects rather than cures for multicollinearity. This distinction helps them view model-building choices as substantive decisions rather than mechanical fixes.

Used-Car Example with Indicator Variables

To reinforce the concept and demonstrate transferability, students next repeat the analysis using a dataset of used-car sales. In this model, the dependent variable is *Selling Price*, and the independent variables include *Vehicle Age*, *Mileage*, and a *Condition* rating, along with several indicator variables representing vehicle features such as *Cruise Control*, *Leather Seats*, and *Premium Audio*. Students quickly notice that *Age* and *Mileage* are strongly correlated—older cars tend to have higher mileage—and that many premium features also co-occur in the same vehicles.

The correlation matrix reveals that these feature indicators are often positively correlated with one another and negatively correlated with *Age* and *Mileage*, meaning that newer cars tend to include more luxury features. When these correlated predictors are included together in a regression model, the coefficients can behave erratically, sometimes yielding counterintuitive results such as a negative coefficient for *Leather Seats* or a nonsignificant effect for *Premium Audio*. This exercise helps students see that multicollinearity extends beyond continuous variables to categorical features that overlap conceptually or occur in bundles. By analyzing both the housing and used-car datasets, students develop transferable skills for diagnosing and explaining multicollinearity across diverse business contexts.

ASSESSMENT AND REFLECTION

To evaluate the effectiveness of this instructional approach, both informal and formal assessments were conducted across multiple course offerings. Instructors collected student reflections, in-class discussion notes, and short post-activity quizzes designed to measure conceptual understanding of multiple regression and multicollinearity. These activities were implemented as part of normal course instruction; no identifiable student data were collected, and institutional review board approval was therefore not required.

Observed Outcomes

Students consistently reported that the real-estate and used-car pricing datasets helped them visualize regression concepts in ways that felt authentic and intuitive. When shown the counterintuitive negative coefficient for *Bedrooms*, most students questioned the result and were eager to reconcile it—precisely the curiosity the activity is designed to spark. Subsequent exposure to the correlation matrix and model comparisons helped students connect abstract statistical reasoning with observable data patterns.

Quiz results and written responses indicated improvement in three key areas:

- **Recognition.** Students became more adept at spotting potential multicollinearity using scatterplots and correlation matrices before running a regression model.
- **Interpretation.** Students demonstrated greater ability to explain why coefficients change sign or lose significance when predictors are correlated.
- **Remediation.** Students felt more confident proposing solutions such as variable selection and composite or ratio variables.

Instructor Reflections

Instructors noted that the exercises were most effective when students had time to experiment; for example, running models iteratively rather than observing a single demonstration. Allowing students to dismantle a regression model and then repair it using mitigation strategies reinforced ownership of learning. The spreadsheet environment also reduced barriers to engagement; students could manipulate data directly without additional software training, making the activity accessible to those with limited programming experience.

A recurring challenge involved pacing. Some students quickly grasped the intuition behind multicollinearity, while others required multiple passes through the data to understand its implications. Group work and peer discussion helped mitigate this variability by encouraging students to explain concepts in their own words.

DISCUSSION AND CONCLUSION

Teaching multiple regression effectively in undergraduate business analytics courses requires more than procedural instruction. Students must learn to interpret models critically and recognize when statistical results conflict with common sense or business logic. Multicollinearity offers a natural opportunity to cultivate that interpretive skill: it demonstrates how valid-looking models can mislead when predictors share redundant information.

This paper contributes to the statistics education literature by presenting a spreadsheet-based, visualization-driven approach that helps students see and solve multicollinearity. By using familiar, real-world contexts—real-estate pricing and used-car valuation—students engage with data that mirror authentic decision-making environments. The approach encourages guided discovery: students first encounter the problem through counterintuitive results, then diagnose it using correlations, and finally apply mitigation techniques such as variable selection, composite, or ratio variables.

Instructor reflections and student assessments suggest that this method improves comprehension of both regression mechanics and statistical reasoning. Visualization and iteration proved especially powerful in translating abstract diagnostics into practical insight. At the same time, results underscore the importance of pacing and structured discussion, both of which help accommodate diverse quantitative backgrounds.

Future work might expand this framework to larger or more complex datasets, explore integration with AI-assisted tools, or examine longitudinal retention of these concepts across multiple courses. For now, the evidence supports a clear conclusion: when students can visualize, question, and iteratively repair their own models, multicollinearity transforms from an obscure technical issue into a memorable and illuminating lesson about how data behave in the real world.

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How and Why a Traditional Accounting Information Systems (AIS) course was Transitioned into an Advisory Services course

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ABSTRACT

This paper profiles the process of how a traditional (undergraduate) AIS course evolved to prepare students for an advisory services career path. Advisory is one of the main service line offerings – along with Audit and Tax - of the larger accounting firms. Our effort at a large, private university generated comparatively high accounting course enrollments and resulted in the creation of a new concentration (Major) as well as a Minor for non-business students. Against the nationwide backdrop of declining rates of students selecting traditional accounting as a concentration, this pivot was successful in attracting new students. The contribution of this article is to demonstrate how and why innovation in course design can take place in the undergraduate accounting curriculum to better position students for emerging trends in the workplace and to provide for a greater opportunity to foster critical thinking skills in students. This serves as a case example and hopefully inspiration for others interested in pursuing a similar effort.

Keywords: advisory, ais, problem-based learning

INTRODUCTION

This paper demonstrates how the traditional Accounting Information Systems (AIS) course transformed into an advisory-focused course and what motivated this change.

Relative to motivation, the first is the need for experiential learning to better equip students for successful careers in Advisory services. The nature of consulting services in the larger accounting firms – based on the lead author's experience as an advisory partner at one of the Big Four firms – requires staff to have well developed problem-solving skills. These skills can be relied on to identify business process improvements, technology “use case” analysis, risk analysis, data analytics, and/or undertake transaction advisory services. Framing course materials along the advisory service lines is appealing to students as they can see potential career path trajectories.

A second motivation is that the traditional approach to teaching AIS focuses on relational databases and transaction cycle analysis through a traditional lecture and textbook approach. While this has started to change – based on the lead author's experience of teaching AIS for ten years before evolving the course to an Advisory focus – there is still little in the way of Problem-Based Learning (PBL). Hence, there was a need to take the traditional material and extend it to reflect the service lines typically found in Advisory services (as noted above). This process adds elements of realism and critical thinking by adding student project work that can involve real client experiences.

This transition worked well for the lead author due in part to his experience in the Advisory field prior to teaching full-time at a larger university. Others who might consider such an approach should evaluate whether the types of project experience described in this article are available in their local market. Based on their experiences, the authors hope to demonstrate that there is a wide range of PBL applications suitable to most AIS subject matters. More broadly, this project focus enables extension of the traditional course into an Advisory offering.

The well-documented [Dawkins et al., 2022]; [Gabbi, 2019]; [Gonzalez, 2022] decline in the number of undergraduate students desiring to major in accounting is a final motivation. Accordingly, expanding the ways to make Accounting a more attractive offering to undergraduate students is important. The field of advisory (or consulting more generally) has inherent appeal to many students and thus leads to more interest in accounting as a field of study.

BACKGROUND

Relative to traditional accounting services, the advisory service line has grown to be the largest and fastest growing, at least among some of the larger firms. This has inherent appeal to students in addition to the problem-solving nature of advisory work.

The share of auditing services in Big Four global revenue has been on decline. It dropped to 30.6% at EY and 35.3% at PwC for the year ending June 30, down from 42.4% and 46%, respectively, a decade earlier. EY's audit revenue, as

of this year, is no longer the firm's largest business line based on dollar volume. [WSJ, 11/21/23]

A survey of the larger global accounting firms' leaders [*International Accounting Bulletin*, 2022] reveals that increases in consulting and advisory demand are due to a variety of factors, including digital transformation, the growth of AI, data security, and risk services. Additionally, the recent (first time) selection of one of its Advisory partners as the new global chairperson at one of the largest accounting firms (PWC) underscores the importance of advisory as a growth driver.

PwC's selection of a consultant may indicate that audit isn't as central to the growth strategy as it used to be [WSJ, 11/21/23]

The growth of advisory services among professional firms provides meaningful employment opportunities for accounting students beyond audit and tax positions, particularly those with an AIS style background. Published data at the authors' institution (a large university) for full-time placement of 2022 undergraduates indicate "Advisory" concentrators represented 5 percent of total placements across all business majors, followed by Audit at 4 percent, Tax at 3 percent and "Corporate Accounting" at 2 percent. These data also indicate more placements in Advisory over either Audit or Tax among the Big Four firms.

Further, at the authors' institution, the median starting salary for "Advisory" undergraduates was almost 18 percent above that for Audit and similarly for Tax. These data indicate advisory placements drawn from both accounting and finance concentrators for placements in global, national, and regional firms. The authors' Advisory course draws a particularly large share of finance/accounting double concentrators. The presence of these double concentrators bolsters the overall accounting department numbers.

Recent publications highlight the attractiveness of Client Advisory Services (CAS) in the accounting profession, largely due to the growth in demand. For example, *The CPA Practice Advisor's 2025* report highlights key trends in accounting, specifically indicating a trend toward the shift in Advisory services. The report indicated that 83 percent of firms already include advisory services as a core offering with a meaningful number seeking to expand these services. Further, the high-growth firms were found to be 49 percent more likely to emphasize advisory services. Similarly, the AICPA's CAS Benchmark 2022 study indicated that since 2018 there has been double digit growth for CAS practices.

The Advisory service line at the accounting firms typically spans process improvement (particularly in the financial performance and analysis realm), technology "use case" consulting (increasingly around emerging technologies), and risk consulting. Transaction advisory is a related service line for projects such as IPO readiness and M&A. In the authors' Advisory course, one class period is devoted to Transaction advisory in a workshop format, which is a "gap" in the traditional AIS format. Other such gaps in the traditional AIS format include needing a deeper focus on risk advisory and critically evaluating specific ways in which a business process can be improved via risk reduction, better cycle time, cost elimination and similar attributes. Additionally, the advisory focus affords a great focus on the "use cases" as to how businesses can use emerging technologies such as blockchain and machine learning to improve business processes.

It is worth noting that the new CPA exam puts the role of technology at the forefront [Cole, 2023] for accounting education. Two of the three new "Discipline Exam" sections are Business Analysis and Reporting (BAR) and Information Systems and Controls (ISC). The authors found that the topic of process improvement consulting fits particularly well in the realm of "Business Analysis" and for the job title "Business Analyst." Both titles can also represent internal advisory roles within client organizations. Additionally, the new CPA exam material will also cover methods to transform data for decision making, the use of automated tools, visualization, and data analytic techniques to add value to client projects. For the authors, these industry trends and changes mirror the evolution of the traditional AIS course into an advisory-focused one.

The academic literature emphasizes that providing experiential learning is an important tool to attract students to accounting concentration. Deaver [2018] points out that even in smaller college settings - where there may not be many external "client" opportunities - students may nonetheless find project opportunities "internally" or within the university setting. Along these lines, the authors of this paper found student project work opportunities assessing university internal controls, developing dashboards to measure impact of the faculty senate, and even "use" case applications of AI to assist administrators in assessing university-wide student reflection statements for signs of mental distress. Another author [Kenney, 2024] provides an example that in one of their most popular accounting course students participate in actual financial-fraud investigation cases with the Michigan State Police. A contribution of the

authors' paper are the examples provided of external (community-based) student projects that help develop advisory skills on course related topics (see Appendix 3).

TRADITIONAL AIS CURRICULUM

It is well documented that an information systems curriculum needs to evolve over time -- due to the dynamic nature of the subject matter -- and that such evolutions have indeed taken place. Professors teaching such courses need to first identify career paths that students will graduate into and then analyze the knowledge domains required given future technological changes [Swanson et al, 1979]. Other authors show how the AIS curriculum has evolved due to regulatory change [Murthy et al, 2009]. Further, the prevalence of how big data [Larkin, 2020] has led to the introduction of data analytic material in AIS courses.

AIS is, in essence, a subset of Management Information Systems with a focus on accounting and finance related process flows. The catalyst that spurred the stronger emphasis of risk and controls into the AIS curriculum was Enron's failure and subsequent Sarbanes Oxley legislation. This led the accounting firms to focus more on risk advisory service lines for their clients and subsequently the AIS curriculum evolved somewhat to include more emphasis on this topic. Similarly, Big data and related trends has led accounting firms to provide more advisory services in the form of helping clients manage their technology investments to generate and leverage data for competitive advantage. This has recently led to the introduction of data analytics courses in the accounting curriculum and the very recent revision of popular AIS textbooks to include some new material on this topic. In short, the traditional AIS curriculum has adapted to broad changes in the business environment and will likely continue to do so as automation increasingly takes over more routine accounting related tasks. Consequently, accountants are asked to provide more value-added insights rather than traditional number crunching. This places a premium on critical thinking skills.

Typically, the topics taught in the traditional AIS course include transaction cycles, relational database modelling, system controls and audit, and the systems development lifecycle. A typical AIS semester project might include building a transaction cycle in a relational database such as Microsoft Access.

While the Advisory course at the authors' institution retains many of these topics, the emphasis shifts to mapping and analyzing ways to improve business processes, more cost/benefit assessments on controls, and a greater focus on having students develop a "use case" mindset to advise clients on emerging technologies.

Discussions with industry professionals in the Advisory field – who were asked to provide their insights to help design the new concentration at the authors' institution - also emphasized the importance of problem based learning and critical thinking skills. As such, the Advisory course at the subject university pivoted this direction.

PROBLEM-BASED LEARNING

There is significant literature on the relevance of PBL in accounting education. Examples of this literature germane to accounting education include the role of outcome-based learning [Salin, 2010], problem-based learning generally [Thomas et al, 2016], enhancing critical thinking [Hansen, 2008], and the role of having students engage in questions to extract the necessary information to undertake an analysis [Stanley et al, 2012]. This last study found that the *"successful implementation of PBL in accounting through 'learning by doing' could be the catalyst for change to bring about better learning outcomes for accounting graduates."*

The traditional AIS course has limited PBL applications (e.g., build a basic Sales cycle using Microsoft Access). The Advisory course more readily lends itself to PBL. The essence of consulting is understanding the client's issues, formulating an analysis based on available information, and providing results in an understandable way. As illustrated in Appendix 3, there PBL applications can involve a wide range of technology applications (e.g., building apps and dashboards, using drones,...)

Within the undergraduate accounting field, the success of PBL learning in the Volunteer Income Tax Assistance (VITA) student experience [Efrat et al, 2020] is well researched. The limited research on accounting-based service learning beyond VITA scenarios [e.g., Lafond et al, 2021] underscores the value of these approaches for accounting education. Hence, the Advisory format is a good fit for expanding similar PBL applications.

Within a specific AIS context, there is a contemporary paper showing how to use the COSO framework to mitigate student and faculty risk on service- learning projects in accounting [Bee et al, 2021]. Another forthcoming paper [Behrend et al, forthcoming] provides an internal control case requiring students to flowchart risk and controls for actual business owners. Accordingly, there is inherent appeal of PBL.

CASE STUDY OF THE AUTHORS' APPROACH

Traditional AIS course design relies on AIS textbooks with end-of-chapter homework, two exams, and a final group project. For the project, each team imports a series of Excel transaction data tables into Microsoft Access to create a relational database with sample forms, reports, and queries. In the authors' pivot the format of the two exams stayed despite changing the course from "AIS" to "Advisory and Emerging Systems in Accounting," but the pivot provided students with a variety of project choices and more in-depth "supplemental" homework that more closely mimics the process, technology, and risk consulting service lines. It is relevant to note that with the pivot the traditional AIS textbook was made optional and a custom course book was provided. Exams were not based on test bank material associated with the traditional textbook.

Table 1 provides a summary of how the authors' course evolved relative to the core modules. The Changes column in Table 1 depicts how the specific topics of a traditional AIS course evolved to have more of an Advisory "look and feel". The changes were motivated from discussions with practitioners – two of the Big Four firms and one each of a national and regional accounting firm - in the Advisory field. For example, in the first module of an AIS course the focus is typically on the flow of transaction cycles (i.e., events in the Sales cycle) and how to flowchart the process. Practitioners indicate that flowcharting is a relevant skill – although one that may be taken over increasingly by AI applications – but the value-added component for the advisor to the client is a focus on how to improve the process. Hence, asking students to take a process (e.g., see the supplemental homework assignment described in Appendix 2) and evaluate how to make it "better". This can be done by determining if cost can be taken out (perhaps via new technologies), risk reduced, throughput increased, cycle time reduced, less resources used, more customer insights gained, and/or similar insights truly puts the student in the role of an advisor.

Similarly in Table 1, practitioners emphasize that while understanding relational databases is a foundation skill, an advisor value added role would be to evaluate the use cases for how emerging technologies (e.g., Blockchain) improve a process. Practitioners also emphasized the importance of augmenting traditional cost benefit tools - for risk and controls or System Development Life Cycle (SDLC) analyses – with probabilistic features given increased expectations of clients. Lastly, the group project/presentation module in Table 1 shows a change from a traditional project of having all students use Microsoft Access to build a relational database of a business process to a wider range of project choices, including actual client projects requiring course content applications. Practitioners thought this approach helps signal the real interest of the student and allows a deeper exploration of a topic in a job interview. The real client projects (see the "Mini Case Studies" component of Appendix 3) further require unstructured problem solving and real client interaction efforts. These are important skills in the eyes of practitioners.

In addition to the authors' discussions with practitioners it is notable that other external authors provide similar rationale for how the course has changed. Donnelly [2025] notes that the new Uniform CPA Examination now requires real-world skills that candidates need to employ in practice. The author states "as a result, the way subjects like taxation have traditionally been taught in preparation for the old exam format may no longer suffice." As an example, Donnelly also provides a road map to task-based simulations for educators to better prepare students.

JUSTIFICATION FOR THE CHANGES

The most significant justification is that emerging technologies are changing the skill sets that employers in the entry level accounting fields are looking for. Critical thinking skills are important. The pivot to a course that involves project-based learning and relies on the development of a common set of "Business Analyst" skills (e.g., how processes might be improved with emerging technologies) provide avenues for students to learn these skills. In addition to this theme in the popular press, it is a theme in academic research. Casziani and Tullar (2017) present survey results of faculty from forty-four universities to conclude students can improve their critical thinking by engaging in primary and secondary research to inform their model assumptions in consulting projects. Kent et al (2023) find that consulting projects enables students to grapple with nuance and ambiguity relative to the employment needs of many organizations.

Hands-on project work options include specific developing specific use cases for emerging technologies such as drones, Virtual Reality (VR) headsets and building dashboards/apps/relational databases for non-profit organizations.

Table 1. Summary of the evolution of a traditional AIS course into an “Advisory and Emerging Systems” course at the subject university.

	Traditional AIS course modules	Advisory Course modules	Changes	Rationale
I	Transactional cycles (2 weeks)	(.5 week) Process Mapping & Process Improvement mindset (1.5 weeks)	Less recording focus, more on how to map a transactional cycle & more emphasis on ways to improve a process	What advisors fundamentally do and enables a deeper dive in the process consulting ¹ service line
II	Relational databases (4 weeks)	(2 weeks) cover different types of emerging technologies & associated use cases along with the traditional REA model	More content on RPA, Blockchain, AI...& presentation ² of mini cases to demonstrate applications	Deeper dive into the technology advisory service line from a “use case” perspective
III	Risk & Controls (2 weeks)	COSO/COBIT (1 week) Data analysis/visualization (1 week)	Probabilistic ways to measure risk, how to integrate w/process mapping, and C/B analysis of controls	Deep dive into the Risk advisory service line
IV	SDLC (2 weeks)	Cost/benefit (C/B) Analysis techniques around new technology investment decisions (1 week)	More sophisticated ³ DCF techniques using Monte Carlo techniques	Practical part of most advisory projects and Business Analyst roles generally
V	Group Projects/ Presentations (2 weeks)	(2 weeks) Same Microsoft Access project for everyone	Much wider range of topics for students to self-select into, including a few topics with real clients	Personalized learning choices often enable deeper learning

¹ “Advisory” at the larger accounting firms typically have three broad service lines: technology consulting, risk consulting and performance improvement.

² Mini cases can be articles, previous semester student projects and/or discussions around custom speaker (recorded) presentations.

³ Including more refined requirements of students to identify and quantify the benefits of new technology. Additionally, introduce probabilistic thinking, such as Monte Carlo DCF techniques and concepts.

Further, students can use packaged software to build Smart contracts, perform regressions to analyze simulated fraud examples, and undertaking simulations using a large set of audit algorithms. This enables more engaged learning beyond lecture and textbook presentations. For example, two organizations – Mindbridge and TrueUpNow – provide student accessible simulations to (respectively) enable students to better understand how ML pattern analysis and VR can assist to make audit inquiries more effective.

ADDITIONAL CHANGES

In addition to these changes, there is greater emphasis in the Advisory course on mastering different modes of critical thinking in specific sections of the course:

- *Design thinking* – utilized in business process mapping, data visualization, and determination of the “objects” in a relational database system design.
- *System thinking* – relational database builds, REA and E-R diagrams, risk and controls, emerging technology “use case” analysis.
- *Offense/defense, What Could Go Wrong* – risk and controls.
- *Probabilistic thinking* – risk and controls, cost/benefit analysis on the system investment decision.
- *Analytical thinking* – asking the right question and selecting the right statistical tools in a data analytics framework.
- *Ethical thinking* – the role of bias in AI based approaches to analyses such as an audit or credit/lending assessment.

The authors use “supplemental” homework in lieu of traditional end-of-chapter textbook homework. These include flowcharting (utilizing Lucid Chart, a free digital tool) the specific transactions of a subject company and then determining potential improvements such as where to decrease risk. Additionally, mini case studies on risk and control analysis, evaluating a system investment decision using discounted cash flow techniques, and database applications (e.g., SQL and building insightful management queries from a sample data set) are used. In class, PBL applications include a variety of smaller, firsthand exercises such as determining in what circumstances a drone would be useful in an audit.

Further, the use of recorded speaker videos from advisory practitioners from a range of firms helps students understand the wide range of advisory related career paths. That is, in addition to the Advisory and Transaction advisory practices at the larger firms, opportunities also exist in boutique risk consulting practices. Even the role of internal audit is relevant, where the nature of the service is advisory.

Finally, students are provided with a range of semester-long, group project topic choices. Students are required to present their work to their peers in the classroom with an extensive Q&A afterwards to simulate a client’s experience, all of which is scored as part of the participation grade. These group projects include a variety of real system advisory projects for local non-profit organizations such as land trusts, food rescue organizations, and local community health organizations. The authors arrange these interactions with local advisory professionals to enable students to hone their skills since such project management and interaction. These “soft” skills are important in the Advisory field and the accounting profession generally. Appendix 3 provides an illustration of this approach.

EVIDENCE OF THE EFFECTIVENESS OF THE AUTHORS’ APPROACH

The Appeal to Students as Evidenced Through Comparative Course Enrollments

This transformation of the course, coupled with trends in the accounting profession and accounting education, led to the creation of a new minor in “Accounting Advisory” in 2019 for non-business college students in the subject university’s accounting department. This was followed the next year by the creation of a whole new concentration (akin to a major) in “Advisory” within the same accounting department. Over the first year and a half, the new minor has attracted approximately forty new students into the college of business, most of whom are drawn from industrial engineering and computer science primary concentrations. The major has grown to upwards of seventy new Advisory concentrators, many have Finance as a lead concentration and Advisory serving as a complimentary second concentration.

During academic year 2022, the Advisory course attracted more students than either the traditional Audit, Tax or Cost upper-level accounting electives at the subject university. This was not the case in 2016, the last academic year when the traditional AIS course was first offered by one of the authors. Table 2 summarizes the course enrollment data.

Table 2. Comparative Upper-Level Accounting Course Electives Enrollments				
Electives:	Cost	Audit	Tax	Advisory/AIS course title
AY'2022	60	79	97	97 "Advisory"
AY'2016	106	137	139	67 "AIS"
Percent change	(43%)	(42%)	30%	45%

Note 1: Includes summer sessions.

Note 2: courses are for undergraduate students

Note 3: In the Academic Year (AY) 2021 the title of the traditional AIS course was changed to "Advisory and Emerging Systems in Accounting"

Further expanding on Table 2, at the authors' institution there are two tracks for undergraduate accounting concentrators. One is a traditional CPA track, where students typically take Audit and Tax (Financial Reporting I and II are required courses and prerequisites in addition to the introductory financial and managerial accounting courses). The Advisory track is a non-CPA pathway where after taking introductory financial and managerial accounting courses students take the Advisory course coupled with an accounting data analytics course and a financial statement analysis course and then select a fourth course (currently Audit, Tax of Financial Reporting I).

EVIDENCE ON STUDENT COGNITIVE IMPACT

For the six semesters when the AIS course evolved into "*Advisory and Emerging Systems in Accounting*," the average course rating by the students on the core course question "*I learned a lot in this course*" was **4.8** on a five-point Likert scale (with five representing "significant" student agreement with the statement). At the authors' university the "*I learned a lot*" question (five-point Likert scale) is one of the primary metrics of teaching performance. This compares with an average student rating to the same course impact question of **4.2**, averaged over the six semesters when the lead author taught the course in the traditional AIS format. Table 3 summarizes these results.

As a control relative to the teaching experience level of the lead author, the comparison of teacher effectiveness scores specific to the AIS/Advisory course is the same over these two time periods. As further evidence that the increase in scores is not due to just more teaching experience by the lead author, a comparison was made of the student responses in a Managerial Accounting course taught by one the lead author over the same sets of semesters to the same course question. This covered an equal split of sixteen Managerial Accounting courses taught by the lead author and the average scores were the same (4.5 and 4.6) over the two periods.

From 2019 to 2022, student survey scores for the Advisory course to the question "*I learned a lot in this course*" was 4.7 compared to an average score of 4.4 for the accounting department and 4.5 for the university across all courses offered, respectively. Table 3 provides these results.

Table 3. Comparative Student Course Survey Resources: Advisory versus AIS Course			
Average (std dev) response to the question:			
	"I learned a lot in this course"	"What is your overall rating of the instructor's teaching effectiveness?"	Average No. of student responses per semester
Advisory Course (Six semester average, Fall 2019 through Fall 2022)	4.8	4.8	34
AIS Course (Six semester average, Spring 2016 through Spring 2019)	4.2	4.7	33

Note 1: The ratings pertain to the same instructor teaching both formats.

Note 2: Over the 2016-22 period the course textbook remained the same as did the number and content of the course exams. Starting in 2019 students were given a wider range of group project choices instead of the single choice of building a Microsoft Access database of the Sales cycle.

Note 3: At the end of each semester, students complete a course survey with specified question and ask to respond on a five-point scale (i.e., 1= "strongly disagree" with the statement and 5 = "strongly agree"

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EVIDENCE ON STUDENT AFFECTIVE IMPACT

Representative Advisory student qualitative survey responses on the course during the Fall 2023 semester are provided in Appendix 1; these are noteworthy in that they highlight why the Advisory pivot is appealing from a student perspective.

From a client perspective relative to the nonprofit student group projects, the following quote is illustrative from the CEO of one of the largest food pantries in Connecticut:

The client preference project that your students completed for us was a great help. Thank you again! We ended up taking the content and instead of using the Air Table, inserting it into a form, which is the program we use that interface with Salesforce. At first, we did not think it would work, but our Stamford Food Manager was able to use all the work your students had done to get it up and run. I would love to work with you on a future project if one

arises... please keep in touch! And thank you again! Chief Executive Officer, Person-to-Person

From the perspective of other academics, it is worth noting that two of these student group projects have won national recognition at the annual AIS Educators conference each year that such projects were submitted.

Recommendations for Other Faculty Considering a Replication of this Approach

For most accounting students, the Advisory course is hugely different from others where computational exercises are a lead mode of learning. Accordingly, it is important during the first lecture of the Advisory course to describe the course in detail how it differs from more traditional accounting courses. It is also useful to underscore the relevance of this material to their career choices. Students will be exposed to diverse types of critical thinking and PBL; it will likely be outside their comfort zone relative to the emerging technology aspect. It is only fair that students learn about the course learning objectives early into the semester to ensure they are the right fit for them.

Business Process Mapping (and the topic of Process Improvement analysis) is the recommended first module in the course. The basics of flowcharting can be taught quickly, allowing students to delve right into the firsthand nature of the course using free software trials (e.g., Microsoft Visio, Lucidchart, SmartDraw, etc.) Before students start their work, it is helpful to show students an example of what a satisfactorily completed flowchart looks like to “scaffold” the exercise. Standard feedback rubrics facilitate grading, and the students appreciate the structured feedback.

It is useful to encourage the students to construct an informal portfolio by using a digital snipping tool to highlight their work on their LinkedIn profile page. There is no reason that accounting students cannot have a portfolio of their work displayed in a highly concise manner, like architecture students.

Most students are on Apple platforms so certain technologies (e.g., Microsoft Access and Alteryx) can only be taught in lecture format. Additionally, a workaround is needed for direct assignments. For example, importing Excel tables to build a relational database of the Sales cycle on Microsoft Access may require Apple users to perform such work on the university desktops in the campus library or virtual desktops.

Historically in the accounting department, the experience has been to reserve teaching Excel for earlier accounting classes, like Managerial Accounting, and delegate Tableau and Power BI to data analytics courses. However, the Advisory course allows flexibility for student project teams to utilize their experience with these and similar platforms (e.g., Airtable as an alternative to Excel) for their group projects. Equally important is emphasizing the proper documentation, design thinking, and quality control aspects of one's work. These are imperative and widely acknowledged requirements in the fields of finance and accounting.

For group projects involving a real client like a non-profit organization, it is important to define expectations of both the client and the student team upfront given the time and workload constraints of the semester. It is also critical to balance the related workloads across the group project teams. These projects offer students true client experience. An awareness of “scope creep”, as truly found in real world advisory projects, is an important consideration and a worthy learning experience for students that is otherwise hard to replicate in a traditional classroom setting. This type of project also gives student teams valuable insights into the importance and principles of Project Management, including the use of tools such as Gantt charts, like the findings in previously referenced literature [Bee].

The instructor should also be aware of their own bottleneck constraint relative to the ability to mentor each student team in a fair manner. Often a TA can be useful in this regard (the role of the co-author in this paper). Based on the authors' experiences, students who have taken the course have volunteered in subsequent semesters to informally mentor projects that they find interesting.

Relative to the semester long group projects, the students self-select their topics of interest from a list of approved projects by the professor since this facilitates a personal feel to the course. Organize the teams and charters early in the semester with “check in” - or progress points - clearly delineated.

The use of three supplemental homework experiences – a simulated flowchart exercise around process improvement, building a simple transaction database on Microsoft Access, and conducting a risk analysis given a narrative – emphasizes the PBL approach. This takes the place of the typical end-of-chapter reading comprehension questions in most textbooks.

Based on observed experiences, allowing students to complete supplemental homework assignments either solo or in partnership with another student has proved effective. However, enforcing a rotation of partners if they choose to work in pairs promotes diversity in collaboration and broadens their range of perspectives.

The subject matter of the course is broad, which is a challenge, particularly as the topic of “emerging technology” requires ongoing course updating. The advent of conversational AI related tools such as ChatGPT and its impact on the field is a pertinent example. As with all courses, having a well-structured Canvas (or other LMS based) course outline, exam study guide, custom course pack or other tools is quite helpful and appreciated by the students. Admittedly this takes more preparation time relative to teaching many other accounting courses.

Lastly, the ability to do hands-on work and Problem Based Learning cannot be overemphasized. This can be accomplished in class meetings through a flipped classroom format, custom supplemental homework and/or the students’ ability to choose Group Project topics that engage their real interests.

SUMMARY

This paper shows how a traditional AIS course could be evolved to increase student awareness of the Advisory career path and related skill sets. This is made possible by emphasizing the role of Problem Based Learning and critical thinking in the course learning objectives. The paper provides evidence of the course’s significant impact at the subject university and has been successfully taught in both classroom and virtual settings. While it has taken effort to evolve the traditional AIS course this way, the authors enjoyed the process and found the results satisfying.

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Appendix 1

The following are quoted student responses to the end of the **Advisory** course:

Q: Please comment on the strengths of this course and/or ways to improve this course.

The course gives the skills necessary to succeed in the workplace.

I felt this course really opened my eyes to the new technology coming into the accounting world. We learned a ton about different software and how it directly applies to the accounting / advisory field. I felt much more in tune with what's going on in the accounting and advisory industry after this course. I had never known much about advisory prior to this course, and this was a great way to get insight into the profession.

It taught me a lot and actually made me think about my future in accounting.

Great way of getting students to critically think about situations and real-life problems. Felt as though I was solving things as a business professional as opposed to looking at fictional scenarios that couldn't be applied to real life. This class significantly helped me prepare for my co-op interviews which involved scenarios and cases.

The course covers a wide variety of related topics. The various in class exercises/presentations in each of the modules help to reinforce what we discuss in class. The only downside is it can be difficult to know what exactly to study going into tests.

The course is robust and gives a great introduction into learning about AIS tools and the advisory industry

This course is highly relevant to any student with an accounting background.

This class is all about looking at information systems from a different perspective. It involved a lot more critical thinking than any other accounting class that I've taken.

Strength: - very practical, like doing a real work - introduce tech to business students - develop students' problem-solving skills, creativity, learning skills, and so on

This course taught me a lot about how information systems are correlated to Accounting which I never knew, and I find to be very important. The material was interesting, and we covered a diverse range of topics which made it exciting to come to class.

The course was able to synthesize textbook learning with real world practicality very effectively.

Appendix 2

Brief descriptions of technology platforms identified in the article:

Lucid Chart and Smartdraw are free digital flowcharting tools where students can sign up for demonstration accounts. Both include templates to help students get started as well as a click and drag format to place standard flowcharting symbols on to a virtual workspace [www.lucidchart.com and www.smartdraw.com] Microsoft Visio [www.Microsoft.com>visio] is a similar platform but is not as suitable for use for those students using an Apple device.

Alteryx [www.alteryx.com] is both a more sophisticated business process mapping tool and a data analytics platform that also has a thirty-day free trial period. This would be a platform used in an actual business environment.

Tableau and Power BI [www.tableau.com and <https://app.powerbi.com>] are data analytic platforms, with Tableau in particular offering robust data visualization (e.g., dashboards). A challenge with PowerBI is the ability of students on an Apple platform to easily engage with the software.

Microsoft Access [www.microsoft.com>access] is a relational database platform that allows students to import Excel data tables into a visual workspace and then join the tables and create interacting forms, reports and structured queries of the data tables. The queries run on Structure Query Language (SQL) behind the scenes, but the syntax can be readily observed by students if that is a learning objective of the instructor. Similar challenge for students using an Apple device.

Appendix 3

A. Example of a Supplemental Homework Assignment:

ArtCava business process flowcharting assignment: students are asked to review the interview notes of a cava (Spanish champagne) producer outside of Barcelona that has engaged with Airbnb Experiences to conduct tours of the cava facility and vineyard. Students are tasked with converting the narrative of the booking and marketing processes into a Swimlane and Document flowchart using a free digital software tool (e.g., SmartDraw) available on the web. Students are then tasked with describing how they might improve the existing process to make it “better” (e.g., reduce risk, lower costs, and/or increase efficiency).

B. Mini case studies integrated into the lectures showcasing student project work tied to the themes of the lecture (these are artifacts from the projects that the authors can provide to interested parties)

Clinica Esperanza (community health care): This is a PowerPoint that summarizes the work the students undertook to interview and map the analog process used by nurses in this organization to conduct a specific community health program. The PowerPoint provides snips of the flowcharts and is particularly useful in helping the instructor demonstrate how flowcharts are used to show the progression of an Advisory project from Current state to Future state. In this case, the Future State was the Microsoft Access design of the relational database (inclusive of controls) the students proposed and went on to build to stream the analog process.

Person to Person (Food Pantry): this a student video recording capturing his presentation to the nonprofits executives of how they would use the Airtable database they build to enable the organization’s clients to customize their pick-up bags based upon their preferences. An important element of this project was the client preference form (with embedded controls). This project pertains to system thinking and the elements of a relational database (forms, tables, queries and reports) and demonstrates the importance of documenting one’s work for the benefit of the Advisory client.

Boston Public Library: this resource is a Powerpoint deck showcasing the results of the student build of a Tableau dashboard to help the central branch of the BPL track and visualize the relative performance of different branches in the system as to the efficacy of various programs (e.g., after school tutoring, English as a Second Language program etc.). The project highlights some of important filter attributes of Tableau.

Land Trust drone audit: This is a sanitized student report that shows a three-person student team used the results of a drone flyover of a twenty-acre land trust portfolio to not only map and measure the environmental assets on the parcel (e.g., the extent of the tree canopy to remove carbon and marsh grass to absorb groundwater nitrogen) but then to be able to “tell the story” in a broader context (e.g., the dollar value of a ton of carbon absorbed relative to the number of automobiles registered in the town. Additionally, it highlights the use case of an emerging technology in an audit situation.

Big Data Coastal Storm/Sea Level Rise Impact study: this student project of a coastal town in Rhode Island shows how some Advisory projects need to merge data streams from various sources (e.g., NOAA forecasts, digital maps, Python web scraping of town public property tax records...) to estimate the dollar impact (in present value terms) of climate change. The resource in the drop box is an extensive PowerPoint deck of the student presentation.

Educational Technology Management Framework

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ABSTRACT

Technology as a catalyst and change agent in education has traditionally followed a standard business implementation approach. While many business IT concepts can be directly overlaid and applied when implementing technology in education, a different branched approach is needed to ensure educational technology is implemented to focus on key educational concepts that business IT strategy does not address. This article reframes the Educational Technology Management Framework (ETMF) particularly for business education contexts, positioning technology management as a strategic enabler of instructional innovation and workforce-aligned learning. Findings from a two-year case-based implementation demonstrate how pedagogically driven technology management supports experiential learning, faculty innovation, and sustainable digital transformation in business education.

Keywords: Technology Implementation, Educational Technology, Implementation Framework, Lifecycle Management, REACT

INTRODUCTION

Educational technology operates at the intersection of academic rigor and market responsiveness. Despite this expectation, technology implementation in education is frequently guided by enterprise IT frameworks that prioritize governance, compliance, and efficiency rather than instructional innovation and learner outcomes. Most educational institutions do not have a dedicated framework or dedicated strategic plan for managing their technology (Singun, 2025). Many educational institutions rely on standard business technology implementation practices and do not notice any major flaws all while missing key areas specific to education that business technology implementation does not address. Innovation in business education depends on the intentional alignment of technology with pedagogy, particularly in areas such as experiential learning, analytics-driven instruction, simulations, and collaborative problem-solving. The purpose of the Educational Technology Management Framework is to allow new and existing educational institutions to apply this framework to align technology with the strategic educational goals of the institution. This framework utilizes five business technology COBIT principles and aligns them with five key Northwestern Information Design and Strategy program frameworks to produce a complete framework suited for educational technology implementation and management.

PROBLEM STATEMENT

Currently, there is no set framework for educational technology implementation and management. The most commonly used IT management framework is the Control Objectives for Information Technologies (COBIT) framework, created by the Information Systems Audit and Control Association (ISACA). The COBIT IT principles do not address some of educational technology's unique and challenging aspects that are specific to the industry.

FRAMEWORK

The educational technology management framework combines a COBIT principle with an IDS program framework to develop each framework branch of the REACT (Review, Examine, Adjust, Consolidate, and Test) model. When applied to business education, the Educational Technology Management Framework positions technology management as an innovation cycle rather than a compliance-driven process. The REACT model mirrors entrepreneurial and design-thinking methodologies taught within business curricula and supports continuous pedagogical experimentation.

LITERATURE REVIEW

A primary building block for the educational technology management framework is how technology must focus on the end-user and their user experience. Observing the user experience states, “Our philosophy is not about following strict procedures to predictable solutions. It’s about defining (and redefining) specific problems and opportunities -

and then creatively responding to them. The ultimate goal of these tools is not merely to make people happy; it's to make successful products and services by making people happy.”(Goodman et al., 2012). Throughout each step of the framework, it is necessary to continue to reiterate the importance of how a successful implementation of technology, in the end, must provide a service that makes the end-user happy. End-user satisfaction can easily get lost during technology implementation and management with strict procedures and predictable solutions that ignore the underlying factors of implementing and technology management. Without the end-user focus of the framework, the technology becomes an item rather than a tool. In fact user engagement is central to meaningful technology implementation. (Martinez, 2024)

Figure 1. Framework Creation

COBIT Principle →	IDS Framework →	ETMF - REACT Model
Meeting stakeholder needs	User research	Review
Covering the enterprise end-to-end	Data management	Examine
Applying a single integrated framework	Design thinking	Adjust
Enabling a holistic approach	UI/UX Design	Consolidate
Separating governance from management	Constructivist learning theory	Test

- Review critical IT systems and day-to-day operations.
- Examine processes and identify critical areas of improvement.
- Adjust IT systems and processes to best serve the educational institution.
- Consolidate systems and processes focusing on uniformity.
- Test the framework and repeat the REACT model.

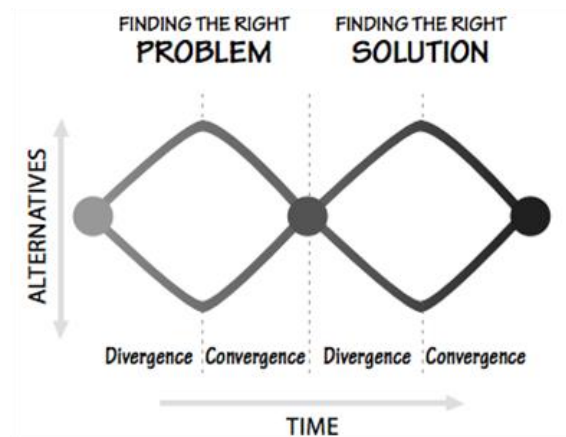
While focusing on the end-user is an important factor, there also needs to be a focus on the leaders in the organization. Merely accepting a technology change will lead to a failed future technological process adoption across the organization. In fact the ability of leadership to foster this change is crucial (Sanchez. S et al. 2025) Organizational leaders need to have an all-in approach to backing the technology framework and clearly understand the rationale behind significant milestones. Kim Erwin states, “We need more than buy-in; we need leaders to fully join our idea - to be involved in integrating it - not merely to accept it. If the idea is big enough and bold enough to disrupt the standard order of things, then “buy in” is no longer enough. It has to be all-in.”(Erwin, 2014). The Educational Technology Management Framework aims to think outside the box of standard technology implementation and management and view educational technology through a new lens. Following the framework's five branches without the all-in approach will lead to subpar results. This framework will still produce positive results if leaders do not fully engage with an all-in mentality but the overall change catalyst of the framework will not be as impactful.

Educational institutions are, in essence, the original learning organization and need to approach the framework with the same learning organization approach. Often technology is approached as a separate entity from the educational institution and focused on a problem-solution system rather than a transfer of knowledge system. The problem-solution approach will work for educational technology departments but will unnecessarily overuse resources, create unnecessary dependencies, and not fully utilize the full potential of the technology. In the Harvard Business Review article Building a Learning Organization, David Garvin states, “A learning organization is an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights.”(Erwin, 2014). This framework is focused on modifying an organization's technology approach and utilization, and must be continually reiterated that the educational technology should change to reflect new knowledge and insights of the learning organization.

In *The Design of Everyday Things*, Don Norman states, “Designers often start by questioning the problem given to them; they expand the scope of the problem, diverging to examine all the fundamental issues that underlie it. Then they converge upon a single problem statement. During the solution phase of their studies, they first expand the space of possible solutions, the divergence phase. Finally, they converge upon a proposed solution (Figure 6.1).”(Norman,

2013). Information technology can be approached as a binary problem to solution thinking but will miss the mark on all the fundamental issues underlying the problem. This framework takes a unique approach to think about branches of the framework as a designer rather than an IT professional or educational leader. This method of thinking is critical to ensure that an organization does not fall into the traditional process of addressing one single issue and not looking at the underlying problems.

Figure 2. Double Diamond Model (Norman, 2013 Figure 6.1)



Taking the double diamond approach will ensure that all the underlying issues are examined and not just looking for quick solutions. This double-diamond approach has the start, middle, and end as three significant milestones that can be used as engagement markers for the team working on technology change or implementation. Having both the technical team and managerial team go through the divergence and convergence phases together will work to build team comradery and explore unique solutions. The double diamond approach also is a catalyst to ensure that all voices are heard during the process as each divergence and convergence opens up and explores new opportunities and solutions regarding the single problem. The conversation behind the divergence and convergence phases can lead to increased buy-in by the leadership and implementation team as they have stepped through and understand the process from problem to solution.

RESEARCH METHODOLOGY

The concept for this framework was seen as a need to address the lack of any notable management framework aimed at educational technology. This framework could be developed and implemented to not only improve the general structure and workflow of the department, but more importantly, focus on how technology can be applied and managed to reach the educational district's mission and vision. All elements of this framework were fully implemented and studied over a two year period. The initial groundwork for the framework generated feedback and allowed for adjustment and reconsideration of certain aspects that would not have been possible without this real-time implementation.

While the primary research focuses on boots-on-the-ground case study research, another secondary research methodology used in this framework was to review and assess previous case study research. The research builds on the case study "Optimal Pathways for Technology Integration towards Blended Learning - Case Study of a Non-Traditional School in Illinois, United States." (Swanson et al, 2021). That case did not address the technology management and overall framework this technology integration would impact. While it would seem standard to start with a broad framework and strategic plan and then work towards project-based case studies, it was very informative and impactful to do the opposite. As this framework was implemented in real-time, and had direct involvement and oversight of the case study project, it created a deeper understanding of the steps needed to not only successfully implement technology towards blended learning but also all the underlying steps that make up a single technology implementation project. Many of the same smaller project-based concepts apply to a more extensive educational technology management framework.

RESEARCH FINDINGS

Findings indicate that pedagogically driven technology management accelerates instructional innovation and improves alignment between technology investments and workforce-relevant learning outcomes in general and in business education in particular. Two key elements were identified that continued to surface for technology management in education throughout our research.

1) Technology Management Is Commonly Treated as Industry-Agnostic.

Consistent with prior literature, the study found that technology management practices in business education closely mirrored those used in non-educational and corporate environments. While this approach ensured technical reliability, it constrained instructional innovation by failing to account for discipline-specific pedagogical needs. When the REACT framework was introduced, stakeholders reported improved instructional relevance as technology decisions became explicitly connected to experiential learning, simulations, and applied problem-solving common in business education.

Very few technology implementation and management frameworks are applicable directly to education. The most common framework is the COBIT framework created by ISACA for information technology management and IT governance. COBIT has excellent principles that overlap with educational technology management and implementation but should not be strictly adhered to as educational technology should have an academic approach and not a business approach. While a business approach to educational technology will ensure technically correct implementation and management, it will not correctly align technology management and implementation with the district's strategic plan, mission, and vision as closely as an educational technology management framework. While technology has some standard aspects across the industry, it is a disservice not to approach technology through a directed lens, especially in business education.

2) Lack of Strategic Technology Planning Limits Pedagogical Impact.

The absence of a clearly articulated strategic technology plan emerged as a significant barrier to sustainable innovation. Prior to implementing the framework, technology decisions were largely reactive, driven by immediate needs or external pressures rather than long-term instructional goals. Embedding technology planning within the broader institutional strategy enabled clearer prioritization, reduced redundancy, and strengthened alignment between technology use and learner readiness for the modern workplace.

Educational institutions commonly have a strategic plan that aligns the district with critical goals and milestones to better the school. Looking at predominant school districts in the area, many had strategic plans, but with little to no reference to technology and the district's technology plan. Technology undoubtedly has impacted our educational institutions in massive ways, and not having a plan for one of the most valuable assets is not the correct approach. A primary example of a strong strategic plan with technology was Lake County Tech Campus, which had a key technology area in their strategic plan with specific action items, timeline, measures, and results. This strategic area of Lake County Tech Campus is a comprehensive technology plan example.

Looking at Chicago Public Schools, the largest school district in Illinois, it was discovered that their strategic plan only had one initiative for technology. Their strategic plan stated one technology goal "Provide a classroom device for every student and teacher. Our students deserve modern technology at their fingertips to support their learning. Within the next five years, every student will be equipped with a device, such as a tablet or laptop, for digital learning in the classroom. These devices will be used at the direction of teachers and educators, who will also be provided a device with classroom management tools to enhance student learning and collaboration. To support that goal, we will also double the internet bandwidth at every one of our schools. This strategy directly addresses the digital divide to ensure that every student, regardless of income or access to technology at home, has the tools and resources needed to benefit from a 21st century education" (Valle et al., 2019). While providing a classroom device for every student and teacher is a great milestone, this goal is not specific or encompassing all major educational technology elements. Knowing that technology plays such an important role in educational experience and growth, one strategic goal of providing a device to every student and teacher cannot cover all elements of technology and properly work towards the district's mission "To provide a high-quality public education for every child, in every neighborhood, that prepares each for success in college, career, and civic life" (Valle et al., 2019).

Figure 3. Lake County Tech Campus Technology Strategic Area (Kapala, 2020)

Figure 3: Lake County Tech Campus Technology Strategic Area (Rapara, 2020)

Lake County Tech Campus

2020-2025 Strategic Plan

Strategic Area: Programming/Technology/Curriculum

Goal Statement: Equip students and teachers with access to the most relevant technology in order to interact confidently with those technologies.

Key Area	Action	Action Manager	Timeline	Measures	Results	2020-2021	2021-2022
Technology	Work with member schools to integrate technology resources and provide equitable access to all students	Lake County Tech Campus Principal Team and Technology Team	2020-2025	Technology usage report	Equitable access for all	Splashtop Remote Access to computer labs to access software and hardware demands of computing courses. Checked-out laptops and Chromebooks for students in need of a device. Updated Tech Academy website with student-friendly tutorials.	All Special Education teachers, case managers, counselors, and liaisons to Tech Campus have access and received training for the Schoology gradebooks of their students to track their progress.
	Research shareable collection system for all components of ESSA	Lake County Tech Campus Principal Team and Technology Team	2020-2025	Technology needs assessment	Increased number of students meeting ESSA goals		Purchases Transeo work based learning software that will provide detailed student data to all member districts regarding ESSA opportunities.
	Recognize and implement the needs of programs through industrial and educational technology	Lake County Tech Campus Principal Team	2020-2025	Annual program reviews	Current programmatic and educational technology throughout the building	Fully remote learning environment specific to programming which helps equate to remote working environment	
	Refine the development of e-Learning and blended learning opportunities and an effective delivery system	Lake CountyTech Campus Principal Team and Technology Team	2020-2025	Student and staff surveys, lesson plans and assessment data	Effective e-Learning opportunities	Integrated Schoology LMS into teaching to manage, provide, & assess student work in an equitable fashion. Provided Remote Access via Splashtop Business for students to gain access to computer lab resources. Additionally, instructors live-stream daily lessons.	Continued support of previous year integration.

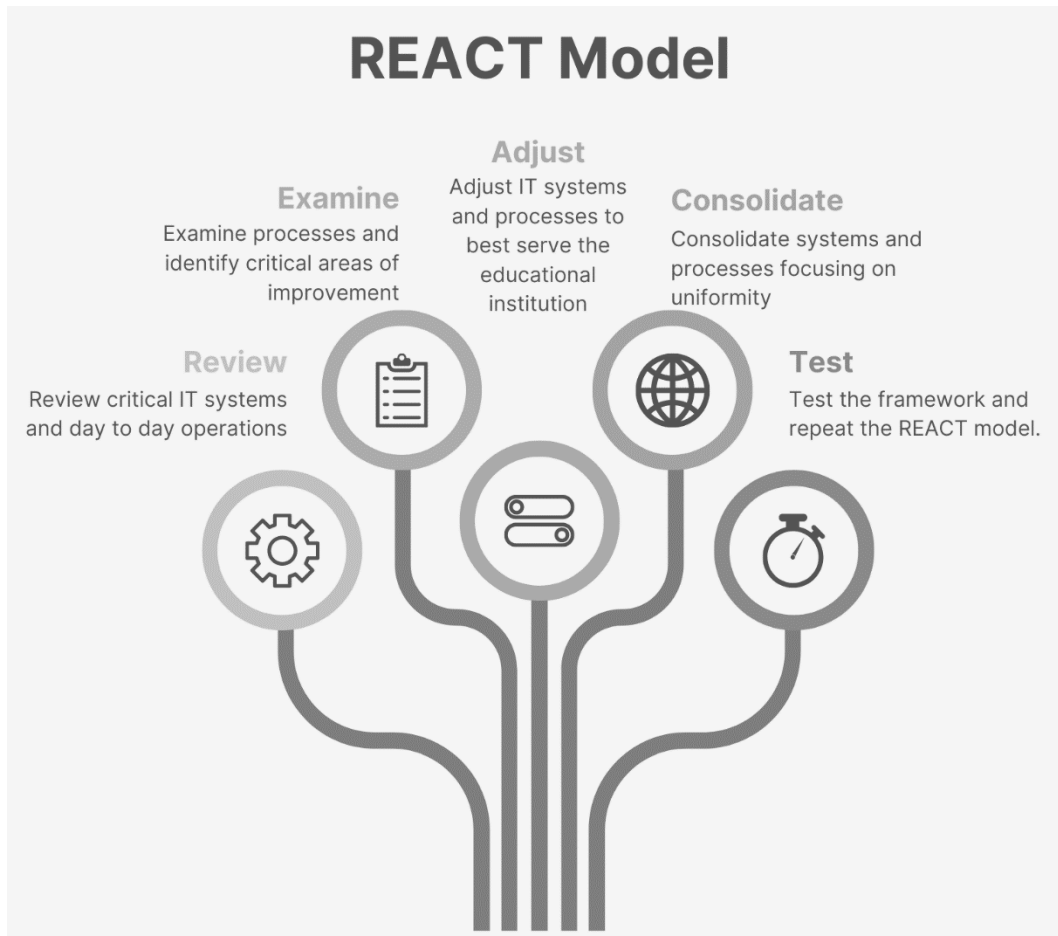
Solution or Treatment:

The solution was the creation of the Educational Technology Management Framework. This framework combines the five core COBIT principles with IDS program frameworks to develop the five framework branches of the REACT (Review, Examine, Adjust, Consolidate, and Test) model. Meaningful innovation in business education requires both context-specific technology management and intentional strategic planning. The Educational Technology Management Framework addresses these needs by differentiating educational technology from generic IT practices and by positioning technology planning as a core component of pedagogical and institutional strategy. The core concept of the REACT model is to directly review and develop an IT strategy and management plan that aligns technology with the educational institution's mission and vision. This framework can be applied in a narrow or broad approach, depending on the depth of strategic plan elements one would like to include and analyze.

- Review critical IT systems and day-to-day operations. This can consist of internal and external technology network and infrastructure assessments and an in-depth look at day-to-day operations and processes. The primary key is to understand the educational technology environment at this point in time and to perform user research. At this stage, it is important to get a general baseline of how the IT department functions and how the end-users use the technology during day-to-day operations. Observation is a crucial component to begin this, as one should not send out a survey regarding user research if one does not have a general understanding of the environment being surveyed.
- Examine processes and identify critical areas of improvement. This stage looks at the pain points and opportunities of what needs improvement and what is working well. Starting the REACT model, must not get too granular as the first few iterations of the model must be broad and then focus on granular elements later on. This is also an excellent time to start developing the educational technology strategic plan and align it with the institution's strategic plan. What are areas of improvement in the next year, two years, and five years?
- Adjust IT systems and processes to best serve the educational institution. This is the time to align the strategic plan (if available) and see the critical educational goals for the institution. How will IT have to adjust to assist the institution in meeting and exceeding these goals? This is an important time to sit down with key stakeholders in the institution and take a deep dive into how IT plays a role in the strategic plan. It is important to ensure that IT is not overlooked when dissecting the goals of the institution, as many backend changes are needed by IT to support the strategic goals. This is a pivotal time to make personnel changes and overall process adjustments. The IT team should directly be involved throughout this framework, so they understand the goals and the reasoning behind the changes.

- Consolidate systems and processes focusing on uniformity. Now it is time for management simplification. What are the primary areas of time spent by both users and IT personnel that can be consolidated or removed with system-wide change? Many educational institutions started with very little technology, then expanded to have too much technology, and now are trying to reduce for management purposes and have a set and manageable technology baseline. Again, this process can start as a broad scope for the first few iterations of the REACT model and then work to become more granular as you continue the model. Now is a great time to consider bringing in a consultant or managed service provider to take a look at best practices and, more importantly, gain insight from an external perspective. Would outsourcing some of the IT services and management be a viable option and the best fiscally responsible approach? Now is the time to determine what path to take to ensure how to best serve the educational institution's needs.

Figure 4. REACT Model



- Test the framework and repeat the REACT model. After the first four branches of the model have been worked through, it is time to take a step back and see if all of the adjustments are working to reach the educational institution's strategic plan and the strategic technology plan (if applicable). How has technical training been implemented to ensure that all stakeholders have the appropriate strategy to work through the new technology changes? Constructivist learning theory is an excellent way to approach technology training and implementation. The goal is to work to create an environment where the end-users are progressing as much as the technology changes. If technology is implemented without the constructivist learning approach, the end-users will quickly become dependent on IT support rather than working through problems independently. While it is vital to provide technical support, it is imperative that a dependent relationship with IT is not needed to solve every problem. The IT department should focus on supporting systems to run correctly and not need to be the expert in every system. This is a great time to engage with technology trainers or coaches to have them give feedback on the changes.

IMPLEMENTATION AND TIMELINE

The REACT model timeline to fully process should not be greater than six months. All five branches of the model should be completed in six months before starting the next iteration. The reason for this timeline is that organizations and technology within the organizations are very fluid and need to be analyzed within six months, so that steps in the framework that are no longer applicable are not being performed. This period would allow the institution to work through the Educational Technology Management Framework twice a year to ensure they stay on top of emerging technologies and drive continuous improvement within the institution. At minimum, the REACT model can be an annual process for an institution depending on the size and overall time allocated to work through this model. The following criteria should be adhered to regardless of the situation, so the model produces optimal results.

- A complete cycle of the REACT model is done prior to restarting another cycle.
- The initial processes of the REACT model starts broad and then eventually can work to a more granular focus after the model has been completed multiple times.
- The REACT model should be performed at a minimum once a year.

For business educators and administrators, ETMF provides:

- A repeatable innovation cycle aligned with business pedagogy.
- A governance structure that supports experimentation without sacrificing consistency.
- A mechanism for aligning technology investments with workforce-relevant learning outcomes.

For researchers, the framework offers a foundation for studying digital transformation and pedagogical innovation within business education settings.

CONCLUSION

This study reinforces two critical insights for education in general and business education in particular: technology management and integration cannot be effectively treated as industry-agnostic, and educational institutions must move beyond ad hoc technology adoption toward deliberate strategic planning.

By explicitly differentiating educational technology from generic enterprise IT and embedding technology planning within institutional strategy, the Educational Technology Management Framework offers a structured yet flexible approach to digital transformation in education. The REACT model enables institutions to align technology decisions with pedagogical priorities, experiential learning models, and workforce expectations, and this is nowhere more relevant than in business education.

Ultimately, aligning technology management with both disciplinary context and strategic intent positions educational institutions to innovate sustainably, enhance instructional quality, and prepare learners for technology-intensive professional environments.

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Manuscript Guidelines, Submission and Review Process

TOPIC AREAS (BUT NOT LIMITED TO THESE):

- Course design – current courses, new courses, new trends in course topics
- Course management – successful policies for attendance, homework, academic honesty ...
- Class material
 - o Description and use of new cases or material
 - o Lecture notes, particularly new and emerging topics not covered effectively in textbooks
 - o Innovative class activities and action-learning – games, active learning, problem based
- Major or emphasis area program design that is new or innovative.
- Assessment – all aspects including AACSB and university level assessment strategies and programs
- Integration of programs or courses with other academic disciplines
- Internship programs
- Business partnerships
- Successful student job placement strategies
- Any topic that relates to higher education business education.

SUBMISSION AND REVIEW PROCESS:

Copyright

- Manuscripts submitted for publication should be original contributions and should not be under consideration with another journal.
- Authors submitting a manuscript for publication warrant that the work is not an infringement of any existing copyright, infringement of proprietary right, invasion of privacy, or libel and will indemnify, defend, and hold Elm Street Press harmless from any damages, expenses, and costs against any breach of such warranty.

Prepare your manuscript

- See the Style Guideline page for specific instructions.
- Articles must make a contribution to business education innovation.
- Manuscripts can be any length. The first 10 pages are charged the current per page rate, and pages over 10 are charged half that rate.
- Articles can be either regular research papers, or shorter notes that succinctly describe innovative classroom teaching methods or activities.
- Manuscripts should be completely finished documents ready for publication if accepted.
- Manuscripts must be in standard acceptable English grammatical construction.
- Manuscripts should be in MS Office Word format. Word 2007 files are acceptable, as are earlier versions of Word. If you are using a new version of Word after Word 2007, save in Word 2007 format.

Submit your manuscript

- Manuscripts may not have been published previously or be under review with another journal.
- Submit the manuscript attached to an email to **submit@beijournal.com**
- We will respond that we have received the manuscript.
- Article submissions can be made at any time.
- Submission deadlines: September 15 for December issue, March 15 for December issue.

Manuscript review

- The editor and reviewers will review your submission to determine if 1) the content makes a contribution to innovative business education, 2) is of the proper page length, 3) is written in proper grammatical English, and 4) is formatted ready for publication.
- Submissions not meeting any of these standards will be returned. You are invited to make revisions and resubmit.
- If the submission meets the standards, the manuscript will be sent to two reviewers who will read, evaluate and comment on your submission.
- The editor will evaluate the reviews and make the final decision. There are 3 possible outcomes:
 - Accept as is.
 - Accept with minor revisions.
 - Not accepted.
- Reviews will be returned promptly. Our commitment is to have a decision to you in less than two months.
- If your paper is not accepted, the evaluation may contain comments from reviewers. You are invited to rewrite and submit again.

If your paper is accepted

- Minor revision suggestions will be transmitted back to you.
- Revise and send back as quickly as possible to meet printer deadlines.
- Upon final acceptance, we will bill you publication fees. See www.beijournal.com for latest per page fees. Sole author fees are discounted.
- The fees include all costs of mailing a copy of the issue to each author via standard postal ground.
- Delivery to locations outside the continental US will cost an additional \$10 per author for 5 day delivery.
- Faster delivery methods are available for US and international delivery. Contact the editor for a specific pricing.
- All publication fees should be remitted within 10 business days of acceptance, if possible.
- If you decide not to publish your paper with BEI Journal after submitting payment, we will refund publication fees less \$200 to cover costs of review and processing.
- Cancellation cannot occur after the paper has been formatted into the final printer's file.

Manuscript Style Guide and Example

An example is provided following these instructions.

This style guide represents style guidelines in effect for future issues, but always check for updates online.

Authors are responsible for checking for correct grammar, construction and spelling. Authors are also responsible for formatting pictures, tables, and figures such that a pdf black and white file sent to the publisher will reproduce in a readable manner.

General Setup:

- All fonts other than exceptions noted below: Times New Roman. 10 point for text. Other sizes as noted below
- Margins: 1 inch on all sides of 8½x11 inch paper size.
- No headers or footers, other than page numbers centered lower.
- Absolutely no footnotes or endnotes via footnote or endnote formatting. For footnotes or endnotes, place a number of the footnote in the proper location as a superscript. Then at the end of the paper or bottom of the page, add the footnote as text with a superscript number to correspond to that footnote.
- Page numbering bottom centered.
- No section breaks in the paper.
- No color, including url's. Format to black. No color in tables or figures. Use shading if necessary.
- All pages must be portrait orientation. Tables and figures in landscape orientations should be reformatted into portrait orientation.
- All paragraphs should be justified left and right, single spaced, in 10 point Times font, no indent on first line, 1 line between each heading and paragraph.
- One line between each paragraph.

Titles, Authors, and Headings:

- **Title centered 14 point bold.** One line between title and author's name.
- Authors: centered, 12 point. Name, affiliation, state, country.
- One line space to **ABSTRACT** (title 10 point, bold, all capitalized, aligned left; text of abstract 10 point, no bold)
- After **ABSTRACT**, one line space, then **Keywords**. Followed by one line space to first major heading.
- **HEADINGS, MAJOR**, 10 point, bold, all capitalized, aligned left.
The specific headlines will be based on the content of the paper, but major sections should at a minimum include an abstract, keywords, introduction, conclusion, and references.
- **Sub-headings:** 10 point, bold, first letter capitalized, no line to following paragraph. Align left.
- *Third level headings:* *Italic*, 10 point, first letter capitalized, no line to following paragraph. Align left.
- **Keywords:** heading: 10 point, bold, first letter capitalized, no line to following paragraph. Align left.
Your list of keywords in 10 point, no bold.

Tables, Figures and Graphs:

- All fonts 10 point.
- Numbered consecutively within each category. Table 1, Figure 1 etc.
- Title: 10 point, bold, left justify title, one space, then the table, figure, etc.
- Example: **Table 1: Statistical Analysis**

References:

- APA format when citing in the text. For example (Smith, 2009).
- References section: 8 point font, first line left margin, continuation lines 0.25 inch indent. Justify left and right. No line spacing between references. List alphabetically by first author.
- Specific references: Last name, First initial, middle initial (and additional authors same style) (year of publication in parentheses). Title of article. *Journal or source in italics*. Volume and issue, page number range.
- Example: Clon, E. and Johanson, E. (2006). Sloppy Writing and Performance in Principles of Economics. *Educational Economics*. V. 14, No. 2, pp 211-233.
- For books: last name, first initial, middle initial (and additional authors same style) (year of publication in parentheses). *Title of book in italics*. Publisher information.
- Example: Houghton, P.M, and Houghton, T.J. (2009). *APA: The Easy Way!* Flint, MI: Baker College.

Example (note that this example represents a change from previous style guides)

Evidence to Support Sloppy Writing Leads to Sloppy Thinking (14 pt bold)

Peter J. Billington, Colorado State University - Pueblo, Colorado, USA (12 point)

Terri Dactil, High Plains University, Alberta, Canada

ABSTRACT (10 point, bold, all capitalized, left justified)

(text: 10 point Times font, no indent, justified, single space, 150 words maximum for the abstract)

The classic phrase “sloppy writing leads to sloppy thinking” has been used by many to make writers develop structured and clear writing. However, although many people do believe this phrase, no one has yet been able to prove that, in fact, sloppy writing leads to sloppy thinking. In this paper, we study the causal relationship between sloppy writing and sloppy thinking.

Keywords: sloppy writing, sloppy thinking (10 point, bold title, first letter capitalized, left justified).

INTRODUCTION (10 point, bold, all capitalized, left justified).

The classic phrase “sloppy writing leads to sloppy thinking” has been used by many to make writers develop structured and clear writing. However, since many people do believe this phrase, no one has yet been able to prove that in fact, sloppy writing leads to sloppy thinking. Is it possible that sloppy writing is done, even with good thinking. Or perhaps excellent writing is developed, even with sloppy thinking.

In this paper, we study the writing of 200 students that attempts to test the theory that sloppy writing leads to sloppy thinking.

PREVIOUS RESEARCH

The original phrase came into wide use around 2005 (Clon, 2006), who observed sloppy writing in economics classes. Sloppy writing was observed in other economics classes (Druden and Ellias, 2003).

RESEARCH DESIGN

Two hundred students in two business statistics sections during one semester were given assignments to write reports on statistical sampling results. The papers were graded on a “sloppiness” factor using...

Data Collection (Sub-heading, bold but not all caps, 10 point, aligned left, bold, no line after to paragraph)

The two hundred students were asked to write 2 short papers during the semester...

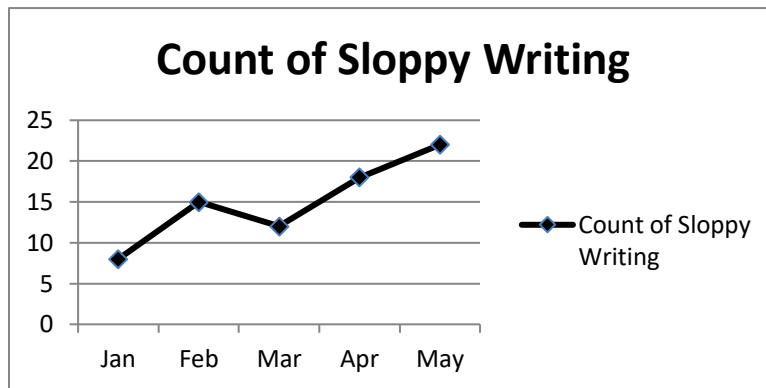
Data Analysis(Sub-heading, bold but not all caps, 10 point, aligned left, bold, no line after to paragraph)

The two hundred students were asked to write 2 short papers during the semester...

DISCUSSION

The resulting statistical analysis shows a significant correlation between sloppy writing and sloppy thinking. As noted below in Figure 1, the amount of sloppy writing increases over the course of the spring semester.

Figure 1: Sloppy Writing During the Semester (10 pt bold, 1 line after to table, left justify)



The count results were compiled and shown in Table 1 below.

Table 1: Counts of Good and Sloppy Writing and Thinking (bold, 1 line after to table, left justify)

	Good Thinking	Sloppy Thinking
Good Writing	5	22
Sloppy Writing	21	36

*-Indicates significance at the 5% level)

As Table 1 shows conclusively, there is not much good writing nor good thinking going on.

CONCLUSIONS

The statistical analysis shows that there is a strong relation between sloppy writing and sloppy thinking, however, it is not clear which causes the other...

Future research will try to determine causality.

REFERENCES (title 10 point, all caps, bold, align left, one line to first reference)

(1 line spacing) (All references 8 point, indent second line 0.25 inch)

- Clon, E. (2006). Sloppy Writing and Performance in Principles of Economics. *Educational Economics*. V. 14, No. 2, pp 211-233.
 Devad, S. and Flotz, J. Evaluation of Factors Influencing Student Class Writing and Performance. *American Journal of Farming Economics*. V. 78, Issue 3, pp 499-502.
 Druden, G. and Ellias, L. (1995). *Principles of Economics*. New York: Irwin.

(short bio section optional, can run longer than these examples; removed before sent to reviewers)

Peter J. Billington, Ph.D., is a professor of operations management at Colorado State University – Pueblo. His research interests include lean six sigma and innovative education.

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Endnote: (do not use word footnote or endnote formatting to accomplish this; see comments above)

Build 3 on 2-18-2026