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Strategies for Integrating Data Analytics in Accounting

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This is to certify that the doctoral study by

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Walden University
2025

Abstract

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Abstract

The increased need for data analytics proficiency requires accounting program directors and faculty to explore strategies to reduce the technology skills gap between education and professional requirements. Grounded in the technology acceptance model, the purpose of this qualitative pragmatic inquiry was to explore strategies that program directors use to integrate data analytics into the accounting program curriculum. The participants were 8 program directors and 2 faculty with over 2 years of program change experience in the accounting department. Data were collected through semi structure interviews with 10 participants and comparative data analysis with the AICPA & NASBA report. Through a thematic analysis, themes were identified: initial training strategies, employer development, data analytics integration and challenges, and forward-looking strategies. A key recommendation is for businesses to consider a department wide strategy versus a predominantly individual employee approach to technology integration. The implications for positive social change include the potential for increased graduates adapted to technology in the professional accounting world increasing levels of transparency and validity to business financial reporting.

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Dedication

I would like to dedicate my doctorate to Aimee for always believing in me and inspiring me to challenge myself. To my brother John thank you for your humor, and encouragement.

Acknowledgments

I wanted to express my gratitude to my doctoral chair, Dr. Dina Samora, for all the feedback, advice, and encouragement along my journey. The impact as a professional and educational mentor will not be forgotten. I would also like to thank my second committee member, Dr. Cheryl Lentz, for all the time, insight, and feedback. My study would not have been as complete without the two of you. Thank you.

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Section 1: Foundation of the Project

The American Institute of Certified Public Accountants (AICPA) and the National Association of State Boards of Accountancy (NASBA; 2021) determined a significant professional gap in the integration of data analytics in accounting programs, hindering professional qualifications in technological agility and big data systems use (BDS) (Baldwin et al., 2023). BDS is familiar to the accounting industry, but its expanded use requires accountants to adapt to compete and develop a digital mindset (Baldwin et al., 2023). Qasim and Kharbat (2020) presented that the rapid adoption of technology in accounting has left a gap not only in the current profession but also in graduates meeting industry and employer needs. The preparation for the new age of accounting requires an increase in professional knowledge to stay relevant to employer demands and the changing professional certification requirements. However, the pace of automation far exceeds the basic excel skill set of graduates leaving professional accountants not prepared for technical competencies needed for the professional workforce (Phillips & McCoy, 2022).

Background of the Problem

The rapid pace of technological growth continues to augment businesses with increasingly large volumes of data collection. Understanding big data enhances traditional accounting in particular to provide deeper insight into financial information and strategic development. Accountants play a significant role in big data collection and analytics, enhancing the accounting skill base and providing deeper insight into financial information (Andiola et al., 2020). The significance is enough to show that job

descriptions will alter in the future to reflect the impact of disruptive technology (Tiron-Tudor et al., 2021). BDA continues to alter professional certifications, enhancing analytics requirements to reflect the data-driven marketplace and mindset (Losi et al., 2022).

The AICPA investigated changing professional needs in technology within the accounting profession. The result of the study determined that a requirement for significant analytical expertise that lead to the new Certified Public Accountant (CPA) Evolution exam supporting the change in business needs (Aldredge et al., 2021; Phillips & McCoy, 2022). The NASBA and AICPA (2021) collaboration released additional guidance encouraging the integration of data analytics into the accounting curriculum with support from the AACSB accreditation body standard A5 and then A7 (Losi et al., 2022). Accountants now function in a digital environment, requiring mastery of current and future disruptive technology (Gambhir & Bhattacharjee, 2022). Burke and Polimenti (2020) confirmed that upon entering the accounting profession, students should know about workforce technology, supporting the A5 and A7 direction. Hence, university program directors continue to strive to develop strategies to foster competencies in BDS.

Infusing data analytics into early areas of the accounting curriculum could provide a basis for later, more extensive analysis in the program (Losi et al., 2022). However, technology gaps remain with faculty training concerns, questions of faculty digital acumen, and curriculum implementation points (Phillips & McCoy, 2022). Andiola et al. (2020) presented multiple factors that impact integration, including budgeting for training, computer lab equipment, and a willingness to continue to upskill

in the profession. Program directors must evaluate the various factors to strategically develop a plan to enhance technology and reduce the professional skill gap supporting the need for additional research.

Business Problem Focus and Project Purpose

Accounting competencies in technology continue to outpace the professional skills of graduating students (Holmes & Douglas, 2022). Akdredge et al. (2021) confirmed, explaining the gap continues to expand in education to professional skills for graduates. The increase in disruptive technology leaves graduates lacking the required industry skills to enter the accounting profession (Holmes & Douglas, 2022). The general business problem is that accounting program directors and faculty face a challenge in meeting the growing demand for graduates with data analytics skills, resulting in a growing gap between meeting CPA certification and employers' requirements. The specific business problem is that some accounting program directors and faculty lack effective strategies to integrate data analytics into the program, hindering the advancement of the program growth and lacking employers' requirements.

Therefore, the purpose of this qualitative pragmatic inquiry is to identify and explore the effective strategies accounting program directors and faculty use to integrate data analytics into the accounting products, thereby meeting employers' requirements and remaining competitive. A pragmatic approach allows for the study of this phenomena within a natural context, addressing practical business issues, and to produce knowledge that may provide practical strategic solutions (Kelly & Cordeiro, 2020). Specifically,

understanding effective strategic approaches may assist program directors and faculty to reduce the technology gap between higher education and employers' requirements.

Population

The targeted population includes up to 10 accounting program directors or faculty with more than 2 years of accounting program change experience to meet business demands. Morris (2000) contended interviews provide a wealth of data, allowing for a smaller sample size to reach saturation. Galvin (2015) and Kelly and Cordiero (2020) emphasized the importance of actionable knowledge and the interconnectedness of experience. Program directors and accounting faculty are in a position within the organization to adapt product offerings to meet business requirements to remain competitive in the marketplace.

Public data from the AICPA were used to determine employer requirements. The triangulation from AICPA and NASBA data, and higher education program directors and faculty may assist in supporting or refuting findings in closing the gap between program enhancements and business needs (Carter et al., 2019).

The program directors and faculty will come from universities in the United States. The interview outcomes may determine effective strategies, processes, perceptions, experiences, and challenges for integrating data analytics employers' requirements.

Conceptual Framework

The framework that grounds this study includes the technology acceptance model (TAM) framework. Davis (1989) created the TAM with two factors perceived usefulness

and perceived ease which affect decisions to employ new technologies. Vankatesh (2000) extended the TAM to explore behavioral indicators, such as fear and anxiety to understand the reluctance to the adoption of technology. For data analytics to be integrated successfully, faculty training is the main strategy for professional development and dissemination into the curriculum.

Perceived usefulness determines if the user perceives the technology as useful to job performance (Davis, 1989). If the user deems the technology has the possibility of being useful, then perceived ease of use (PE) determines the degree of effort or complexity to integrate for use (Davis, 1989). Davis et al. (1989) explained that the two factors influence the behavior of the user, thus correlating behavioral intent to use with the actual system use. Vankatesh's (2000) variables of anxiety or fear add to the dimension of this proposed study by factoring in any apprehension impacting adoption and use. The logical connections between the framework presented and the nature of my study include using the TAM to facilitate the identification and exploration of accounting program directors' effective strategies and related processes for integrating data analytics into the accounting curriculum.

Research Question

The research question for this study is: What effective strategies do program directors use to integrate data analytics for future professional accountants?

Assumptions and Limitations

Assumptions

Bhangu et al. (2023) considered assumptions as common sense in nature, personal beliefs lacking reasoning about people, or a situation being studied. In this study, there is an assumption that questions were answered clearly and honestly in the interview process.

Limitations

The limitation of this study resides in the accounting program director's experience in implementing data analytics into an accounting program. The interviewed experiences may differ significantly from the size, type, and location of the university. Ravitch and Carl (2022) presented that smaller sample sizes are focused on depth, whereas statistical analysis to a wider set may be difficult. Another limitation is the participants recall may be brief and limited in detail of the implementation or planning process. Finally, all participants are volunteers, thus able to remove themselves from the interview at any point in the process, hindering the sample size of the identified population.

Transition

Section 1 introduced the background of technology disruption facing the accounting profession and higher education. Qasim and Kharbat (2020) highlighted the gap between technological adoption in accounting and graduates' preparedness to meet professional needs. Consequently, the AICPA introduced the updated CPA Evolution exam, emphasizing significant analytical expertise (Aldredge et al., 2021; Phillips &

McCoy, 2022). However, higher education program directors need help integrating data analytics into accounting curricula, including faculty training concerns and digital acumen (Phillips & McCoy, 2022). The following sections will cover the literature review (see Section 2), a thematic review of published material on the study topic, the project methodology (see Section 3), and the findings and conclusions (see Section 4).

Section 2: The Literature Review

A Review of the Professional and Academic Literature

The literature segment is a comprehensive review of academic literature justifying my research study. The primary sources for the literature review includes 89 peer-reviewed journal articles, four professional websites and publications, and one seminal book. The peer reviewed articles are with a 5-year period and equate to 91% of the peer journals used. Various databases through Walden University Library, Google Scholar, and professional associations (AICPA, MNCPA) provided peer-reviewed and academic resources. The keywords used in the literature search included *the technology acceptance model (TAM), CPA Evolution, accounting data analytics, big data analytics,* and *accounting automation.*

The literature review begins by exploring the TAM theory, the conceptual framework for this study. The use of the TAM conceptual framework covered multiple areas of technology disciplines, thus providing additional research to narrow the focus of accountants' technology skill set coupled with the professional guidance of the new CPA evolution. The research in the literature review supports the qualitative pragmatic inquiry and addresses the research question: What effective strategies do program directors use to integrate data analytics for future accountants?

Technology Acceptance Model

The TAM model provides an understanding of user tendency toward technology acceptance. Davis (1989) theorized that perceived usefulness influenced the PEU, deducing that the more effortless the use, the more valuable the system is and utilized.

Therefore, determinants of perceived usefulness drive user intentions, causing the need for further study of increased system experience (Venkatesh & Davis, 2000). Venkatesh (2000) acknowledged control and intrinsic motivation could be part of a new system structure for the TAM. However, Venkatesh and Bala (2008) extended PE with determinants for self-efficacy and external control. The extended use of systems coupled with trial-and-error recording of use validates the TAM results (Lux & Knight, 2021). Brozović et al. (2022) results determined the validation of user experience, displaying the strength of the TAM in studies. However, Davis et al. (1989) explained the two factors influence the behavior of the user, thus correlating behavioral intent to use with the actual system use applied to the base of the TAM.

The behavioral intentions derived from the TAM, recognize perceived usefulness (PU) and PE, as essential factors shaping individuals' intentions and behaviors toward technology adoption (Scherer, 2019). However, Razak and Ismail (2022) expanded upon this framework by integrating the TAM with a secondary framework to further extend innovative characteristics beyond mere behavioral intention. Razak and Ismail found that this integration, the combination of PU and information systems (IS), informs responses to a given situation, extending the behavioral variable of uncertainty avoidance (UA). Almaiah et al. (2022) concurred, suggesting UA influenced participant uncertainty tolerance to technology acceptance, increasing the perceived risk the user will face. Consequently, incorporating UA into the analysis yields insight into individual responses to technology, highlighting the significance of addressing uncertainty in technology adoption processes (Razak & Ismail, 2022).

Venkatesh and Davis (2000) evolved the TAM to the TAM 2, which incorporated subjective norms (SN) based on the theory of reasoned action (TRA; Fishbein & Ajzen, 1975). SN added a new dimension influencing PU and behavioral intentions (Venkatesh & Davis, 2000). With the increase of input variables, Alyoussef and Al-Rahmi (2022) found that integrating the TAM with innovative diffusion theory for eLearning offered an extended insight into behavioral factors by adding input variables of trialability (TR), complexity (CO), relative advantage (RA), observability (OB), perceived compatibility (PC), and PE. Integrating factors feeding into PU and PE increases the results of behavioral intention to use (Alyoussef & Al-Rahmi, 2022). Roger (1985) and Davis (1995) shared that introducing positive behavioral perceptions of innovations is critical to adopting technology. Meanwhile, recent studies expand the TAM to the Unified Theory of Acceptance and Use of Technology (UTAUT) with cryptocurrency integration into core business functions infer technology acceptance and behavioral intention for use (Yeong et al., 2022). Khechine et al. (2020) concurred, using the UTAUT as the method of social media constraints in web-based technology adoption.

Irrelevant to the extension or evolution, the TAM remains the most used model to describe the intent of use (Scherer et al., 2019; Shuya et al., 2023). In a meta-analysis review, the TAM predicted user behavior for technology acceptance in an education and professional setting (Scherer et al., 2020; Venkatesh & Davis, 2000). Farsawang and Songkram (2023) utilized the TAM as one of several models to express the factors for university students' behavior in adaptation to technology and the importance of institutional resource and support systems development. Elkmash et al. (2022) studied the

impact of data analytics on building a consumer performance metric through the lens of the TAM. Zhao and Zhao (2021) used the TAM model to determine digital nativity and computer self-efficiency in adopting technology, determining the ability to predict faculty intention for use and the university's overall strategic adoption impact (Frosig, 2023; Huang & Teo, 2021). Thus, such a study is appropriate for the education industry.

With TAM, the most used metrics are PU and PEOU (Yeong et al., 2022). Davis (1989) discussed PU is reflective of the level of technology use an individual determines is useful to completing a job. Davis (1989) furthered that PEOU provides a deeper context of ease of use with minimal effort. Yeong et al. (2022) presented PU as a benefit, bringing joy, pleasure, or enjoyment. In contrast, Hayak et al. (2022) posited PU as a determinant of the extent of belief a user has in the technology and level of increase in job performance. However, Hayak et al. concluded a difficulty establishing conclusive PU and PEU in audit professionals, specifically hindered by too large of a geographic area and communication data collection issues. Moreover, verifying the need for further research within a smaller geographic region, a more conclusive collection process, and the opening of additional research approaches (Hayak et al., 2022).

Moravec (2013) proposed that increased technology feeds into social change, which looped back to increased disruptive technology development. Specifically, Moravec and Martinez-Bravo (2023) furthered by evaluating how the educational ecosystem could influence technological and social change in human behavior. Davis (1989) explained that PEOU refers to the degree to which a person believes that using a particular system would make the task easier and avoid putting in too much effort. Hayek

et al. (2022) explained that the PUOU and the PU are both key dependent variables to measure the acceptance of the external variable. Chen et al. (2022) and Mitra et al. (2022) contend that PEOU is a key indicator in factoring the acceptance and use of technology, emphasizing the need for additional studies in machine learning in a business program.

CPA Evolution

Jackson and Meek (2020) researched the importance of professional employment metrics aligning educational business outcomes. Accounting requires in-depth business knowledge and technology to guide work-integrated learning effectively (WIL) to align with labor market demands (Jackson & Meek, 2020). Jackson and Meeks further defined WIL as integrating work-related educational experience to promote professional accounting expectations and CPA licensure. Aldredge et al. (2020) concurred that the skill gap in the accounting profession reflects the business of education staying the same with the evolving expectations of professional accounting. Aldredge et al. continued by closing the professional gap with competencies that drive curricula aligned with the demands of the technology skillset in the CPA licensure exam. Congruent with Jackson and Meek and the expansion of WIL and technology embracing, Aldredge et al. captured five factors for strategic transformation takeaways that include the ability of letting go of (a) how education worked in the past, (b) transform to a business model of professional growth markets, (c) embracing a new advanced mission for accounting, (d) seizing technology development, and (e) innovating.

The AICPA and NASBA (2023) presented the gap in accounting education and professional skills is impacting the growth of the workforce and stabilizing the CPA

pipeline. Minnesota CPA licensure requirements require professionals and students to have 150 credits with a mix of 24 semesters of upper-level accounting credits and 24 semesters of business courses (Minnesota Certified Public Accountant [MNCPA], 2023). The findings were that most educational programs focus on adapting programs to prepare students to be professional certified accountants (Daly & Weber, 2021). MNCPA (2023) reiterated that a person could sit for the CPA exam with 24-semester credits in accounting but cannot receive licensure until the 150 credits and previously mentioned 24 semester hours of accounting and 24 semester hours of business (MNCPA, 2023). However, the MNCPA concluded that the requirements to be a licensed professional on the ability for the student to increase technology use for all CPA areas. Furthermore, contending that all accounting students should be proficient in data analytics through use in multiple higher education courses (Mintchik et al., 2021).

The CPA exam evolves periodically to adapt to new professional demands (MNCPA, 2023). Roessner (2023) explained that in 2016, the CPA blueprint adjustments included problem-solving and critical thinking. A redesign in 2020 focuses on changing technology growth, and in 2023 another change to incorporate technology, agility, and the need for professional flexibility (AICPA & NASBA, 2023; Roessner,2023; Tysiac, 2020). The joint AICPA and NASBA 2021 survey imparted what the professional accountant needed, sparking the new exam evolution project (Roessner,2023; Tysiac, 2020). The CPA exam effectively changed focus to proving data analytic skillset and technical agility in two main exam segments: (a) the core and (b) the area of specialization (Phillips & McCoy, 2022). Richardson and Watson (2021) concurred with

the core area of Audit and Attestation (Audit) and the outer ring Business Environment and Concepts (BEC) exam, which have various levels of data analytic components intertwined into the exams.

Dorata and Shea (2022) found that the altered exam provided a measuring point of a more profound knowledge structure reflecting the reality of the profession, supporting the need for enhanced public confidence and protection. However, Nickell and Chambers (2022) cautioned that where the AICPA and academia share the focus on preparing students for technology skills, accounting curricula are the foundation for lifelong learning and professional development. Bakarich et al. (2021) emphasized that change is necessary and the higher education accounting program needs learning experiences in current technology and the adaptability to pivot with emerging technologies. The dramatic changes to the CPA exam will mirror the need for change to mirror professional requirements (Bakarich et al., 2021). Bakarich et al. (2021) continued that the impetus for change directly related to professional technology growth, requiring generative AI, big data, cloud computing, and blockchain into the accounting program, removing the professional skills gap. The AICPA and NASBA (2023) directed that the presented changes to the exam should direct functional awareness to technical skill development, enhancing the role CPAs hold in the profession, and needed adjustments to higher educational accounting curriculum to meet professional needs.

Accounting Profession Competency Digital Shift

Atanasovski and Toceva (2022) found a clear presentation of a digital shift tending to align academics and professionals with lessening the technology gap that

aligned with the AICPA and NASBA (2021) report. Specifically, the professional role requires integrative technology such as artificial intelligence (AI) and blockchain for efficient data processing, real-time analysis, and decision-making in accounting (Atanasovski & Toceva, 2022). The AICPA and NASBA (2021) reported more than half of graduate students lack basic digital acumen, governance, internal controls, cyber security, and generative AI skills. Hayek et al. (2022) conferred that the role of an entry-level accountant is obtaining more digital acumen. Thus, finding that new accountants and junior accountants need to adapt quickly from organizing accounts to a digital mindset with data analysis (Hayek et al., 2022). Similarly, Schmidt et al. (2020) found the need for digital acumen by use of the status quo bias theory, with a TAM perceived use model to examine the adaptation to data analytics. Consistent with these results, Hayak et al. presented a call to action approach with a need to incorporate data analytic capabilities into programs in an incremental basis, defending the need for additional research.

The continual change in the accounting profession requires upskilling current professionals to retool education to adapt to the increased unstructured data (Richardson & Watson, 2021). Richardson and Watson (2021) focused on attributing change to one factor to reduce the stigma associated with learning a new skill. However, Richardson and Watson found that no matter the factor selected, some business professionals refuse to develop new technology skills. Tiron-Tudor and Deliu (2021) researched job descriptions, focusing on management accountants and how technology integration enhanced job performance. Tiron-Tudor and Deliu explained that business is altering job

descriptions and titles to reflect the need for big data experience away from traditional accounting roles. Novak et al. (2021) supported that data sets or big data sets are the input where data analytics takes businesses to the next phase of economic and strategic decision-making.

The continual infusion of big data permeates every aspect of a business, requiring organizational adaptation (Alyoussef & Al-Rahmi, 2022; Novak et al., 2021) and altering the skill set of the accounting profession (Hayek et al., 2022; Schmidt et al., 2020). However, Baldwin et al. (2023) presented that exposure to emerging technologies poses a challenge in developing the mindsets to adapt to technology past the initial effort point. Specifically, by adapting the pseudo-model of technology agility, Baldwin et al. concluded a growth mindset could be developed through integration in a classroom and with strategic design thinking. Whereas Tungpantong et al. (2022) reflected that the act of discussing data sets increased data knowledge and promoted creative thinking and promoting digital mindset development. The 2021 AICPA NASBA survey found that data is the underpinning of the accounting profession and accountants are expected to begin a career with more senior level work because entry work is now automated (Roessner, 2023). The survey results aligned with Philips and McCoy (2022), imparting that accounting graduates need a digital mindset and unstructured problem-solving skills to meet professional needs upon graduation. The entry of analytics as a requirement in the profession increases the need for strategic development in accounting programs.

Mintchik et al. (2021) attributed the change in technology to adapting the accounting graduate's mindset to meet industry standards and increase a successful

professional journey. Expanding, Lala et al. (2021) contended that new technology necessitated the requirement for accountants to obtain higher technical skills. Aldredge et al. (2020) postured that technology adaptation in the accounting profession and mainstream accounting curricula have been diverging for some time, requiring a complete strategic transformation to lessen the profession gap. Digital transformation is essential for higher education to monitor because the skill gap will continue unless addressed quickly to meet professional needs (Tungpantong et al., 2022). Hines and Tapis (2022) analyzed the possibility of a standalone model for data analytics framework development. Hines and Tapis reviewed statistical techniques to adapt to developing and emerging technology, Excel, and alternate software to incorporate into real world case studies. Hines and Tapis found that keeping up with technology and having a recruiting class of graduates with data and emerging technology skills is the missing piece for employer's needs. Thus, these findings indicate the need for further research into strategies for technology integration into the accounting curriculum.

Integrating data analytics and automation facilitated a fundamental shift in job descriptions and expectations in managerial accounting (Andreassen, 2020). Andreassen (2020) explained that digital technology facilitates the adaptation of the identity of the managerial accountant to analytical data collection and decision support capabilities. However, integrating analytics in a graduate managerial accounting course presented initial concerns with a need for more technology exposure (Andreassen, 2020). Contrasting Andreassen, Corradino (2021) found after initial technology exposure, anecdotal feedback provided a positive learning experience, increasing technical

knowledge and curiosity (Corradino, 2021). Corradino furthered by concluding relevant analytics projects with corporate partners could quickly increase skill development in a relevant workforce way. Whereas Petkov (2020) reaffirmed that not all accountants will be receptive to change, but small avenues of business change can increase wiliness to learn. In contrast, Baldwin et al. (2023) found that adaptation to technology impacted mindsets differently, but technological agility can return with the required reinforcement of the material. The integration of technology into curriculum with projects and integrated learning may provide a more receptive learning environment.

Professional Skill Gap

Tim Ryan, US Chair and Senior Partner with PwC US, expressed that the analytical gap in the profession is apparent, implying that the lack of digital skills is one of the greatest threats to the workforce (Accounting Today, 2020). The impact of data analytics in the accounting profession is no longer a debate, but one that requires adaptation prior to resistance (Schmidt et al., 2020). Employers expect technical competency and critical situation thinking on day one (Nickell & Chambers, 2022). Nickell and Chambers (2022) attributed critical thinking development to the integration of real-world application and case application to promote technology competencies, ultimately preparing professionals for a rapidly transforming career field. Further, Andiola et al. (2020) found that accountants to contribute to business far past the traditional role and more into an analytic strategic partner, confirming a rapidly transforming career field. The increased role for accountants requires a strategic process for integration into new professional demands.

Phillips and McCoy (2022) identified a gap between students' adeptness in social media and proficiency in business digital literacy, emphasizing a need for stronger skills in data interrogation and critical thinking. Addressing this gap, however, requires more than just integrating technology into the curriculum (Ong & Djajadikerta, 2019). Ong and Djajadikerta (2019) argued that effective educational reform must also emphasize maintaining a foundation in accounting theory and research to ensure students can apply digital tools meaningfully within an accounting framework. Further supporting this perspective, Peng et al. (2023) demonstrated that combining technological agility with soft skills training in accounting curricula expanded students' preparation for the accounting profession. Accordingly, educational programs are increasingly focused on developing curricula that balance technical, theoretical, and soft skills to produce well-rounded graduates ready for certification and professional practice (Daly & Weber, 2021). A strategy to balance technological skills with soft skill development becomes essential requiring further research.

Prem (2022) presented a literature review to determine the selection of accounting as a career, identifying critical success factors indicating college program development to backfill the profession pipeline. Further, Prem identified accountants as knowledge, and innovation leaders in India, representing the critical success direction of the accounting profession, thus, creating an urgency in closing the gap of knowledge with higher education. Aldredge et al. (2021) conveyed that the skill gap is far from new, but postulated curriculum reform is essential in eliminating the gap by promoting a skillset shift to a practitioner level. However, the downward trend of accounting graduates with

digital acumen, logic, and critical thinking skills to be career-ready is cause for concern, leaving firms to recruit from outside the accounting field (Aldredge et al., 2021). Moreover, Bahador and Hader (2020) postulated that an accounting student's education should prepare the graduate for the initial practitioner-level skill set demands. Qasim and Kharbat (2020) countered that the rapid adoption of technology in accounting has left a gap not only in the current profession but also in graduates meeting industry and employer needs. Research into closing the professional and educational gap could uncover strategic development for continued technology adaptation (Kharbat, 2020).

The current scope of learning in data analytics extends beyond traditional faculty and workforce education. In a study of 192 practicing accountants from the 2018 IMA Annual Conference & Expo Research Lab, Schmidt et al. (2020) found that, while practitioners recognized the importance of learning data analytics, the perceived switching costs often reduced their willingness to adopt these new skills. This finding aligns with earlier research by Bollenback and Glassman (2018), where faculty similarly emphasized the need for technical skill development; however, the perceived value of such skills was often confined to individual courses rather than broader professional development. This highlights the need for early adoption and the cultivation of a digital mindset, enabling professionals to pivot more readily as new technological advancements emerge (Schmidt et al., 2020).

Aldredge et al. (2021) emphasized a critical skills gap in accounting, highlighting the need for accounting programs to align more directly with strategic business competencies. Ma’dan et al. (2022) explored this alignment further by surveying industry

professionals in Malaysia to identify key skills required for employability, then working with several universities to integrate these findings into their curricula. Building on this industry-university connection, Ma'dan et al. (2020) provided a framework for enhancing graduate employability through curriculum revision, specifically advocating for the removal of outdated courses and the incorporation of content relevant to evolving professional standards. A proposed strategic approach included offering minors and specialized programs to help students acquire complementary skills, supporting adaptability in dynamic job markets (Ma'dan et al., 2020).

Moreover, Ma'dan et al. (2020) emphasized that policy-makers in Malaysian public universities see the value of creating a learning environment that prioritizes industry-relevant skills alongside theoretical foundations. This approach complements the recommendations of Samuels and Snow (2024), who advocate for technology-agnostic course design that allows flexibility in integrating a range of tools and technologies, thereby accommodating both faculty and student development, but also professional development preferences. This approach indicates the need for strategic development around program foundations and adaptation to increase learning outcomes for both students and faculty (Samuels & Snow, 2024).

Adaptation

Hodder and Lucio (2021) focused on crisis and change impacting employer relations after Covid-19. Specifically, the need for adaptation in the workforce to forge a relationship with academic and professional needs. Where Hodder and Lucio researched professional adaptation, Eilefsen et al. (2020) focused on auditing profession and the

increased need to adapting to the use of analytics. Eilifsen et al. introduced a two phased approach by interviewing public accounting firm heads and 216 partners and management personnel. The interviews consisted of the increased use of advanced data analytics and the perception of use in the firm. Eilifsen et al. indicated professionals could adapt to small engagements, however, larger audits were hindered by firm acceptance. Aldredge et al. (2021) presented competencies for data analytics and determined a learned process is needed to increase accounting professional's data acumen. Zhang et al. (2018) concurred with determining accountants need data skills more than ever, changing the landscape of education. Adaptation becomes the focus of needed research as students and professionals require continued technologic competencies (Zhang et al., 2018).

Dzuranin et al. (2018) identified data analytics as a pivotal force shaping business decision-making, which has profound implications for university curricula, faculty development, and ultimately the accreditation and success of accounting programs. Dzuranin et al. argued that updating accounting curricula to align with industry demands necessitates a structured framework that administrators can use to guide departments and to prioritize training opportunities for faculty and industry professional development. Similarly, Clark et al. (2020) proposed a thematic approach to learning analytics, emphasizing that successful implementation requires both financial investment and strategic backing from senior administration. This alignment with senior administration support echoes the findings of Eilifsen et al. (2020) and Hodder and Lucio (2021), who underscore the necessity of leadership buy-in and adaptation to a model of data analytics

that integrates effectively into teaching and learning practices. A key issue, as Clark et al. (2020) noted, lied in developing faculty capacity to accurately collect and interpret data in ways that are reliable for both strategic and instructional purposes. Supporting this, Aldredge et al. (2021) concluded that accounting educators should aim to create transformative, world-class curricula that align closely with professional standards, preparing students for the demands of an increasingly data-driven accounting profession. The development of digital acumen by faculty increases the possibility of data analysis integration in the curriculum (Aldredge et al., 2021).

Dow et al. (2021) presented a structured approach for aligning accounting program goals with specific course-level objectives, offering a framework that includes case study integration and curriculum design guided by diffusion of innovation theory. This method provided accounting educators with business oriented practical steps to elevate program objectives while tailoring curriculum elements to meet the dynamic needs of the field (Dow, 2021). In contrast, Eilifsen et al. (2020) took a cautious perspective on adopting audit data analytics (ADA) in auditing, suggesting that many firms adopt a wait-and-see stance regarding ADA integration. However, Kasztelnik and Campbell (2023) argued that the profession has evolved, now requiring advanced analytic skills in modeling, prediction, and data visualization—skills that are essential for modern accounting roles and the evolving CPA exam. The modern accounting world continues to integrate data, requiring accountants and programs to pivot into evolving technology advancements with ease without a strategy to adopt efficiently (Kasztelnik & Campbell, 2023).

Supporting this shift, Bahador and Haider (2020) observed that integrating information technology within accounting education increased graduates' readiness to transition effectively into professional roles. Despite these advancements, Kotb et al. (2019) reported that while faculty recognize the importance of technology integration, they often lack access to adequate training and resources, hindering curriculum redesign efforts. Holmes and Douglas (2022) further emphasized the need for such curricular adjustments, noting that the rise of disruptive technologies has left some graduates underprepared to meet industry demands. Together, these studies underline a critical call for accounting programs to expand their focus on technology and data analytics, thus equipping students with the skills necessary to excel in an increasingly data-driven and tech-centered profession.

The AICPA and NASBA (2021) reported mixed results from a 317-sample set of educators, indicating an inconsistent application of technology use in the overall curriculum, with the majority focusing on minor application, two to 12 class sessions, in the Intermediate Accounting and Accounting Information Systems curriculum. Being adaptive and providing faculty to integrate the technology to explore specific course topics allow for more course integration and new course development past entry-level use (Polimenti & Burke, 2021). Nickell and Chambers (2022) presented that technology expectations challenge faculty to incorporate into multiple courses without removing other skill development work. Nevertheless, Nickell and Chambers suggested mapping out a plan and integrating e-resources and Excel to complement current assignments might circumvent a complete curriculum revision. Hence, the research calls for a clear

curriculum mapping to the course assignments for integration but challenges the need for technology compliant faculty for delivery (Polimenti & Burke, 2021).

Building a current curriculum that is adaptive to new technology needs requires innovative simulations and material that is more relevant than textbook material (Wenxu & Shuyi, 2021). Gambhir and Bhattacharjee (2022) instilled that both accounting and finance require course technology integration to develop analytical and visualization skills. Where Richarson and Watson (2021) leaned on the refocusing of accounting to complement technology in each course area, Mintchik et al. (2021) explored a growth mindset that can occur in a single accounting course, enhancing students' willingness to translate to a continual lifelong learning model. Thus, traditional accounting can become divergent, and design thinking can build fast reactions, creativity, and critical thinking (Mintchik et al., 2021).

Samuels and Snow (2024) reflected that the earlier the accounting course process technology is introduced, the familiarity becomes the underpinning of acceptance of use in other courses. The implementation guidance can reflect the faculty’s comfort level of providing a clean data set or challenging students with more profound skill development in the lower course structure (Samuals & Snow, 2024). Dana and Prosser (2024) reiterated that the curriculum needs to change to meet the demands of the industry. Reflecting on past case analyses, Dana and Prosser concurred that the need for early infusion of technology gradually increases with each course to build adaptability to technology integration. The adaptation from one course to another is the cornerstone of developing a digital mindset and fostering divergent thinking (Mintchik et al., 2021).

Engagement in Data Analytics

The engagement of faculty in integrating analytics into academic programs has garnered significant attention, with a particular focus on its implications for business education. McKee (2017) suggested that fostering faculty engagement can effectively begin with introducing basic course analytics, which helps faculty become comfortable and familiar with analytics as a foundation for broader usage within courses. Building on this approach, Bollenback and Glassman (2018) surveyed 113 business faculty across undergraduate and graduate programs and found that 84 faculty acknowledged the added value analytics brings to coursework. However, the business faculty also identified a critical need for training, with another 84 respondents indicating they would require support to effectively integrate analytics into the curriculum (Bollenback & Glassman, 2018). This finding aligned with broader business practices, where data analytics are leveraged as tools for strategic decision-making, as noted by Popoola et al. (2024). Popoola et al.'s study emphasized the strategic value of business analysis in enhancing organizational efficiency and optimizing operations, drawing a parallel to the transformative potential of analytics within educational settings. This highlights the potential willingness to integrate, but also the need to develop training to leverage emerging technology.

Xu et al. (2024) explored the level of analytics integration in academic programs, revealing a discrepancy between faculty perceptions and industry standards. Faculty members viewed a 9.3% integration level as adequate, whereas business professionals advocated for a minimum of 13.9%. Xu et al. concluded that faculty willingness is the

underpinning of successful analytics integration, underscoring the importance of aligning academic practices with industry expectations. Similarly, Elhajjar and Ouaida (2020) contended that while awareness of technology can be a non-factor, perceived usefulness significantly influences technology adoption, aligning with findings by Hamood (2023) that faculty attitudes are pivotal to technology integration, particularly within business-oriented programs. This result is congruent with Popoola et al. (2024), who argued that the strategic implementation of business analysis not only enhances operational effectiveness but also supports informed decision-making processes. Thus, enhancing the need for a formal strategy for technology integration.

As lifelong learners, faculty require continuous development to adapt to emerging technologies, noted by Kazu and Demiralp (2016). Frosig (2023) also highlighted the importance of addressing faculty concerns regarding self-efficacy and the perceived impact of analytics on student learning outcomes and adaptation to the business profession. In a business context, such development fosters a culture of strategic thinking and data-driven decision-making, as evidenced by Gambhir and Bhattacharjee (2022), who argued that skillset development in analytics creates new opportunities for decision-making. Losi et al. (2022) underscored the need for higher education to blend professional interaction, technology investments, and faculty development to foster engagement, especially among tenure-track faculty. In business programs, skill set development remain essential in enhancing the new generation of business leaders, but to be effective a continuous training and strategic plan must be followed.

Digital competency also plays a crucial role in technology adoption. Antonietti et al. (2022) proposed that faculty members with higher digital competency find it easier to integrate technology into curricula, though self-efficacy remained a determining factor in acceptance of technology. Scherer et al. (2019) corroborated this finding, faculty might experience behavioral conflict if institutional support for technology includes the perception as inadequate to address self-efficacy concerns. In the business field, Popoola et al. (2024) emphasized that fostering digital and analytical skills contributed to organizational adaptability, a value mirrored in both a business and educational settings where faculty and professional competency in analytics directly impacts success. Thus, understanding how to properly close the professional and educational gap becomes essential for business success.

Xu et al. (2024) hypothesized that faculty members' perceived behavioral control influenced course evaluation outcomes, suggesting that behavioral factors are essential in technology adoption. Xu et al. recommended that planned behavior models incorporate professional partnerships to develop customized learning experiences in analytics. The recommendation aligns with Popoola et al. (2024), who advocated for strategic business analysis in enhancing operations. Collectively, these studies underscore that analytics integration in business education depends on faculty members' comfort, perceived usefulness, digital competency, and willingness to engage in continuous professional development (Popoola et al., 2024; Scherer et al, 2019; Xu et al., 2024). Faculty engagement in analytics thus mirrors the strategic imperatives seen in business settings, where data-driven decisions and operational efficiencies are essential for organizational

success (Popoola et al., 2024). The findings of these studies collectively advocate for additional research in the building of data analytics within faculty and curriculum.

Strategic Development

The integration of analytics and AI into accounting and business curricula reflects a strategic response to the evolving demands of Industry 4.0 (Richardson & Watson, 2021). Richardson and Watson (2021) argued that accountants are not being replaced by technological advancements but are instead adapting to harness operational analytics to drive strategic decision-making. Similarly, Eilifsen et al. (2020) emphasized the accountant's role in deciphering data to identify performance trends, underscoring the shift from traditional tasks to a focus on analytical insight. The findings indicated multiple avenues for future research including behavioral strategies to increase technology use and application in the accounting profession (Eilifsen et al., 2020).

Faculty are central to bridging this gap by integrating data analytics into curricula, although unfamiliarity with tools and evaluation methods creates immense challenges (Bollenback & Glassman, 2018). Strategically, institutions are broadening the traditional accounting focus to include new skill sets aimed at closing the analytics proficiency gap. Aldredge et al. (2021) contended that this expanded focus lays the foundation for a modernized approach to accounting education, which Baldwin et al. (2023) supported by proposing a morphological box strategy that maps data management skills in the curriculum, providing measurable pathways for skill development.

The role of AI in business intelligence (BI) further complements this shift. Bharadiya (2023) conducted a comparative study on BI and AI in the context of big data

analytics, emphasizing how the fusion of AI with BI transforms data interpretation, operational efficiency, and strategic foresight in business environments. AI-driven analytics frameworks, as Bharadiya argued, facilitate a comprehensive approach to data, enabling businesses to make real-time, data-informed decisions. This emphasis on AI aligns with the curricular expansion in accounting education, where educators are preparing students to leverage AI as a strategic tool for data analysis and insight generation (Bharaddiya, 2023).

Losi et al. (2022) identified specific gaps in analytics integration, with faculty noting challenges in defining analytics objectives and collaborating across departments. Their study concluded with an action plan to improve data analytics strategies, which aligns with Bharadiya's (2023) findings on the benefits of AI-enabled BI in enhancing organizational adaptability. The strategic framework Losi et al. proposed mirrors the AI-driven approaches in business that Bharadiya highlighted, particularly in developing responsive, adaptable systems to meet dynamic data demands. However, the results from both are missing strategic direction for closing an analytics gap and requiring additional research.

The advent of Industry 4.0, propelled by advancements in AI and digital technology, has spurred a shift toward enhanced digital competency in accounting education (Atanaasovski & Toceva, 2022; Richardson & Watson, 2021). Atanaasovski and Toceva (2022) attributed this shift to a new industrial paradigm, while Martinelli et al. (2021) described it as the foundation for the factory of the future, driven by AI and big data. Bharadiya's (2023) comparison of BI and AI in business reflected this paradigm

shift, underscoring how AI not only supplements decision-making but also reshapes business operations, enabling agile responses to rapidly changing market conditions. For academic institutions, this evolution calls for digital literacy initiatives that prepare students for AI-integrated environments in accounting and business (Farsawang & Songkram, 2023).

The role of AI in enhancing data-driven insight is evident in accounting as well. Shu and Ye (2023) explored AI's role in big data analytics, noting that machine learning models facilitate knowledge discovery and enhance data interpretation. Maphosa and Maphosa (2023) extended this perspective within higher education, illustrating how AI-driven educational frameworks allow faculty to create adaptive learning experiences that reflect data patterns and increase precision. Specifically, Maphosa and Maphosa's analysis highlighted the accelerated growth of AI applications across disciplines, demonstrating that higher education institutions to invest in AI to enrich academic outcomes to mimic business needs. Bharadiya's (2023) study supported these findings, emphasizing AI's capacity to transform data analytics and streamline knowledge discovery, crucial in adapting educational strategies for future business professionals. This adaptation is crucial for AI adaptation but requires further research to develop strategic avenues to incorporate effectively (Maphosa & Maphosa,2023).

Faculty professional business training and development remain critical to the successful integration of analytics and AI within accounting education. While Ionescu (2022) observed an increase in publications on data analytics in accounting, Bacher-Hicks et al. (2021) noted a post-COVID rise in searches for technology learning

resources, indicating a growing interest in expanding faculty and student knowledge. Farsawang and Songkram (2023) further advocated for the triangulation of qualitative and quantitative research to highlight the urgency for improved digital literacy and training in AI and analytics within universities to enhance business performance and underpin students with technology competencies for professional preparedness.

Sanoran and Ruangprapun (2023) promoted strategies to integrate AI-driven analytics for anomaly detection and substantive testing, enhancing the efficacy of audits. However, the challenge of academic integrity arises with data-driven tools, as Lux and Knight (2021) warned of potential dishonesty in Excel-based projects. Lux and Knight (2021) recommend the implementation of macros as a preventive measure, highlighting the need for clear protocols around technology use in business and academia. Even as institutions adopt more advanced analytics programs, Sarkar et al. (2021) observed that the rapid pace of technology often surpasses faculty training, presenting barriers to seamless integration. The pace of the technology evolution and training of personnel ahead of the course dynamics becomes problematic (Sarkar et al., 2021).

Transformative Strategies

Digital transformation reshaped business operations, moving from production efficiencies to more sophisticated management information systems that underpin strategic decision-making (Flayverbom et al., 2019). Flayverbom et al. (2019) argued that digitalization has influenced societal norms and business processes, yet big data demands industry-specific strategies that align with ethical and legal standards. In accounting, the integration of diverse systems and transactional data has prompted new strategic

approaches (Kokina & Blanchette, 2019). Kokina and Blanchette (2019) posited that this shift enables analytics and robotic process automation to support strategic insights, paving the way for enhanced operational efficiencies and predictive capabilities. Digital transformation offers immense business insight but requires strategic alignment with the business.

As digital data becomes central to business operations, Ibrahim et al. (2021) likened big data's role in accounting to a holistic view of business data, enhancing predictive modeling and supporting strategic development. Building on this, Kokina et al. (2021) suggested that when accountants triangulate diverse data points and analyze variables impacting performance, they emerge as digital innovators who drive strategic transformations in their organizations. The more technology continues to increase, the more technical knowledge and storytelling skills will become the forefront of business acumen requirements, particularly in finance for predictive and prescriptive models (Jayabalan, 2024). For storytelling to occur, data proficiency must be developed.

Data visualization and dashboarding expanded the monitoring of business processes and has a notable influence on the accounting profession and education (Jayabalan, 2024). Sun (2022) explored a transformative model that incorporates industry cases into accounting courses to foster knowledge explosions, helping students achieve measurable gains in content mastery, knowledge acquisition, and practical application. However, Polimenti and Burke (2021) cautioned that learning tools and strategies must remain adaptable to accommodate emerging solutions, as students' technological adaptability and commitment to ongoing education are essential for maintaining

relevancy in the field. In another approach, Jayabalan (2024) explained that irrelevant of the industry, a transformative strategy develops in automated reporting, real-time insights, data analysis, with ethical and transparent AI models.

Showalter and Krawczyk (2022) highlighted a faculty-centric strategy, implementing a data analytics boot camp for educators, later expanding to graduate students through subgroup sessions at an internal emerging technology summit. This structured approach provided an ongoing, scalable model for introducing disruptive technologies to both faculty and students in accounting. Conversely, Miltner (2022) critiqued boot camps as rapid learning tools, suggesting they should serve as supplements rather than long-term solutions. Meanwhile, Chen (2022) emphasized the importance of integrating AI and data analytics directly into business curricula, arguing that embedding these skills within core programs is critical for developing students' technical competencies.

Polimenti and Burke (2021) proposed a dual-committee approach as a transformative strategy for curriculum revision, establishing an internal blue-ribbon committee to review curriculum and technology needs, followed by an advisory committee of industry professionals to ensure workforce alignment. This strategy facilitated a holistic curriculum update that closed the skills gap between academia and industry. Similarly, Taylor et al. (2024) advocated for industry partnerships to bolster program relevance; a collaboration with Deloitte led to a simulation that mirrored real-world accounting technology demands, providing students and faculty hands-on training with industry-standard platforms.

In another approach, Choo and Tan (2024) examined the role of data analytics in enhancing student retention in accounting courses. Choo and Tan's strategy linked analytics to retention by demonstrating that data-driven insights could strengthen students' comprehension and retention of course content, as measured by improved test scores and learning outcomes. Similarly, Corradino (2021) emphasized the value of hands-on analytics projects, where students develop critical thinking skills through data exploration, categorizing variables, and formulating data-driven questions. This approach aligns with Choo and Tan's findings, reinforcing the potential for analytics to deepen student knowledge and adaptability through practical application.

Transition

Section 2 provided the literature review for the conceptual framework and research question: What effective strategies do accounting program directors use for integrating data analytics in the curriculum to meet CPA certification and employers' requirements? The emerging themes organizing this section were the TAM, the CPA exam, the Accounting Profession digital shift, the higher education skill gap, curriculum adaptation, faculty engagement, and strategic development. Each theme area will provide an underpinning of published knowledge to support and further my research.

Section 3 will focus on the research project methodology, specifically identifying the role of the researcher, ethical considerations, IRB approval information, and the discussion of the nature of the method and project design. This will be followed by the specific population, data collection process, and interview details, leading to data

organization and analysis and concluding with the reliability and validity of the study. Section 4 will follow with the findings and conclusion of the study.

Section 3: Research Project Methodology

Section 3 will center on the research project methodology of the qualitative study. This section will begin by exploring the role of the researcher, along with ethical and procedural considerations, followed by the project's design and approach. Moreover, descriptions will clarify the specific population, sampling techniques, and the selection rationale for the study. Additional information will elaborate on the data collection process, organization strategies, and the development of interview questions to align with the study's objectives. The section includes evaluation of the study's reliability and validity to ensure robust and credible findings. Last, the anticipated limitations or challenges of the methodology and suggested strategies are discussed.

Project Ethics

The role of the researcher is essential in a qualitative study. The researcher is an active instrument in the data collection and interpretation and ensures ethical standards are upheld (Merriam & Tisdell, 2016). Merriam and Tisdell (2016) explained that the researcher also has potential shortcomings and biases that may impact the study. Braun and Clarke (2022) presented researcher bias as a conceptualization of the researcher's values, presenting as a distortion of object reality. Thus, the researcher, being a part of the data collection process, provides transparency and credibility (Yin, 2018).

The researcher's ethics directly impact the validity and reliability of a study, underpinning the integrity and ethical stance in the process (Hillbrink & Jucks, 2019). I have been a part of higher education for 22 years, beginning as an adjunct and progressing to the Program Director of Master and Undergraduate Accounting programs.

My experience includes leading efforts in curriculum redesign, course design, and accreditation. As a faculty member, my experience includes all areas of accounting, finance, business, and economics. Before higher education, I led businesses and, later, a state agency in various business areas for 25+ years. For this study, I am aware of my personal bias and will take the additional step of member checking to mitigate bias and increase credibility in the study. Meriam and Tisdale (2016) posited that the researcher requires mitigation awareness techniques, to avoid or reduce personal biases.

Singh et al. (2022) reflected that a means to mitigate the risk of bias is to ensure replication and enhance accuracy. The key is to reduce the inclusion of personal bias at each step, including the interview process (Singh et al., 2022). Merriam and Tisdell (2020) concurred that an interview is a conversation with a purpose where the researcher can focus on the issue and the respondent's viewpoint. In the interview, I will use semi-structured interview questions to direct with questions but allow for expansion of the participants viewpoint (Merriam & Tisdell, 2020). Yin (2018) offered that a semi-structured interview allowed for the flexibility of a Zoom interview. The focus of the study will be on the questions and during the Zoom interviews to increase the study's validity, thus focusing on the program director or faculty participant and member checking to ensure accuracy. Accuracy was also evident in the interview protocol, which asked participants the same questions (Merriam & Tisdell, 2020).

The use of informed consent remains consistent with the Belmont Report's three focal areas of respect for persons, beneficence, and justice (Pritchard, 2021). To be mindful of these three areas, participants will be given reminders of the ability to remove

themselves from the interview or project at any point. Any names or institutions will remain anonymous in the study and the results. A coded number provided to the participants will mask identities. All recordings and transcripts will reside in a safe in my home and then be destroyed on the fifth anniversary of the study to protect the participants. Finally, the final doctoral project included the Walden IRB approval of 12-26-24-0227260.

Nature of the Project

The nature of this study is a qualitative approach. This approach is appropriate for this study because a qualitative approach allows for the exploration of the phenomena and the exploration of participants' perceptions. Merriam and Tisdell (2016) explained a qualitative approach provide for an interpretation of experiences, a picture of the environment created, and the meaning attributed to the phenomena. However, the data set from the AICPA is specific to elements relating to qualitative CPA evolution results, thus not appropriate for the intent of this study to explore effective data analytic strategy**.**

The design is the pragmatic inquiry with the use of semi-structured interviews to collect perceptions from program directors and faculty on low-risk aspects of professional roles to uncover factors that influence data analytics adoption and use. A pragmatic inquiry will provide the opportunity for direct replication and analytical conclusions will be stronger than a single case study (Yin, 2018). Hence, the data from a pragmatic inquiry can fill potential gaps from the first case and enhance the analytic conclusions.

Population, Sampling, and Participants

Morris (2000) contended that the more detailed answers provided by each interview may justify a smaller sample set. Hennick and Kaiser (2022) summarized various routes to saturation and determined that 5-10 interviews were significant in finding saturation. However, Sargent (2012) reflected that when the participant is deep in knowledge, saturation will occur quickly, but if saturation is absent, the number of participants should increase.

The participants of the study are accounting program directors or faculty with more than 2 years of accounting program change experience at a university. The participants must have experience in guiding changes in an accounting program to be able to address the research problem. Sargeant (2012) indicated participants for a study should reflect the knowledge of the research question to enhance the study results. Thus, criteria for participation are selective to a leader of the accounting department of either undergraduate or graduate level, has experience in updating, changing, or redeveloping courses and or programs, and familiarity with the industry.

The selection of the population for this study was through purposeful sampling. Yin (2018) explained purposeful sampling is a smaller sample, selected to meet the criteria of the inclusion criteria (Merriam & Tisdell, 2020; Subedi, 2023). The purposeful selection allows for a data search to identify the program directors, or equivalent, without hindering the use of time calling each university. Thus, a sampling strategy that focuses on the typical participants that work in higher education overseeing the accounting department. The identification of a participant through a data search allowed for more

data points to be checked and ensured the person met many of the study inclusion criteria prior to the first contact point. The remainder of the qualifiers would be known after the first contact point and prior to acceptance to participate in a semi-structured interview process.

Kelly and Cordiero (2020) emphasized the importance of actionable knowledge and the interconnectedness of experience. Program directors are in a position within the organization, where they have the course experience and oversee the accounting specific programs. The learned knowledge provides practical consequences and reasoning, providing an anchoring of respondent's experience in the phenomena (Kelly & Cordiero, 2020). Adding the data component from the AICPA for employer requirements, data saturation should occur. Hennick and Kaiser (2022) summarized various routes to saturation and determined that five to 10 interviews were significant in finding saturation. Based on the breadth and nature of the research question, a smaller sample size can allow for a comprehensive saturation, but note, if repetitive information is not achieved, then the sample size should be increased (Subedi, 2023).

Data Collection Activities

The data collection process for this study is a semi-structured interview process. Merriam and Tisdell (2020) described semi-structured interviews are structured, but flexible, allowing the interviewer to respond to the situational flow of the moment. Yin (2018) explained semi-structure as a study of the participants and interaction with the process, allowing for structure to guide, but flexibility for participants answers. Hence, I

will be using semi-structured interview for data collection from the program directors or equivalent.

The interview took place over Zoom, which allowed for recording without video, and the use of a handheld recording device as a backup. For validity, I used a member check with the transcripts to confirm wording with the participant. Once the transcript is transcribed and proofread for any errors, the document is confirmed. Singh et al. (2022) presented that bias can be mitigated through replication, thus, confirming questions and answers could indicate a level of accuracy in the data collection process. The presented interview protocol, guiding the interview, is in the Appendix and was used throughout the interview collection process.

The second form of data collection comes from the AICPA, and NASBA (2021) accounting program curriculum gap analysis report. The report provides data points coinciding with the research focus. The use of data provided a triangulation to shore up internal validity (Merriam & Tisdall, 2020; Natow, 2020; Sargeant, 2012). The data were from a public source and is non-sensitive.

Interview Questions

1. How did you integrate data analytics into the accounting curriculum?
2. How did you determine employer expectations?
3. What challenges did you face in expanding the use of data analytics into the curriculum?

4. What strategies for training/professional development do you incorporate for faculty?
5. How did you measure if the integration of data analytics met employer needs?
6. How did partnerships with employers and industry groups help provide better insights to inform program design and strategy?
7. What data sources do program directors find most valuable for understanding skill gaps in employer needs?
8. What changes would you make to your implementation strategy of data analytics for future technology implementation strategic plans?
9. What additional information, if anything would you like to add to this interview?

Data Organization and Analysis Techniques

In a qualitative study, I am the primary data collection instrument (Dhakal, 2022; Merriam & Tisdell, 2016). Collins and Stockton (2022) presented that because the interviewer is the instrument playing a part in a scene. The data collection process of semi-structured interviews over Zoom is the initial scene, collecting rich data on the experience of the program director or faculty member (Singh et al., 2022; Yin, 2018). Following the interview protocol (see Appendix), transcripts of the interview were promptly provided to be checked by the member within 2 days for validation. Once the validation occurred, NVivo, a qualitative data analysis software tool, analyzed and determined themes (Dhakal, 2022). According to Braun and Clarke (2022), thematic analysis has six phases: (a) familiarizing yourself with the dataset, (b) coding, (c)

generating initial themes, (d) developing and reviewing themes, (e) refining and defining themes, and (f) writing. The NVivo database application is designed to process the data collection and analyze the six phases of thematic analysis. Data themes from the AICPA and NASBA joint reports were then added to determine a triangulation. Triangulation uses other materials to validate the results (Natow, 2020).

Familiarization

The first step is to become immersed in the data (Braun & Clarke, 2022). The review included the recordings of each interview and create word-for-word transcripts to send to the interviewees. Immersion is the process of gaining a deeper understanding of the data (Braun & Clarke, 2022). After validating the transcript for accuracy, I uploaded the verified transcripts into NVivo 15. NVivo 15 can import many documents to capture the text (Dhakal, 2022).

Coding

In thematic analysis, coding explores the data for meaning and relevance to the research question (Braun & Clarke, 2022). The output of the code allows for code labels that identifies different meanings (Braun & Clarke, 2022). However, with the use of NVivo 15, the provided tools format patterns to develop options to sort, label, and organize the coded data (Dhakal, 2022). Nvivo 15 used the term node which is synonymous with code in either a thematic approach or case approach (Dhakel, 2022). For this study, codes or nodes were used to initially organize the data to the research question.

Generate themes

In this part of the process, organization occurs by reviewing theme results from NVIVO 15 and searching for any potentially missing themes in the data. Braun and Clarke (2022) explained that exploring the data codes, potentially connecting codes, and clustering them into candidate themes assists in relating the outcomes to the research question and possibly results in a pattern. NVivo has a cadre of tools to frame the data and present relationships (Dhakel, 2022).

Develop and Review Themes

The development and review phase provide a validity check on the developed themes, reengaging to see if a different pattern could develop (Braun & Clarke, 2022). In NVivo process, maps and other reporting functions can visually represent the relationships in the data, allowing for another way to develop richness to the themes (Dhakel, 2022). I generated multiple reports from visual mapping to Node relationships to determine if a new pattern can develop.

Refining and Defining

In this phase, I refined the analysis to demonstrate the richness of the data and the flow (Braun & Clarke, 2022). The manifestation of the themes required additional checking for internal theme clarity, the boundary for the theme, and what the theme contributes to the research problem (Braun & Clarke, 2022). Employing the naming of the themes and the final shaping of the outcomes encapsulated the refining and defining stage. This stage took time to develop the analytical insights (Braun & Clarke, 2022).

Write Up

Braun and Clarke (2022) liken writing to telling the study's analytic story. The thematic results were formatted to reflect the conceptual framework of the TAM. In this phase, the goal was to interpret the analysis of past theme development to explain its significance in relation to the research problem (Braun & Clarke, 2022). Triangulation with public source data validated and deepened the data quality and validity.

Reliability and Validity

Reliability

In a qualitative study, reliability is based on the trustworthiness of the data and should be validated through multiple methods to create dependability (Subedi, 2023). The employ of member checking to validate the reliability of the interview transcripts and use data points from the AICPA and NASBA (2021) provides data triangulation. Furthermore, Subedi (2023) suggested an audit trail of the documentation to substantiate the process and allow for transferability. Confirmation was made to documents in the data collection, analysis, and interpretation process to strengthen dependability will ensure transparency in the process.

Validity

According to Merriam and Tisdell (2020), internal validity hinges on the meaning of reality and credibility. Qualitative research is holistic, not quantitative in structure, and more about documenting experiences and observations (Merriam & Tisdell, 2020). To capture experiences, the goal was to conduct semi-structured interviews with participants. Moreover, I provided member checking by (a) completing a detailed review of the

transcripts, then (b) sending the transcript to the participant for validation of wording and meaning. Finally, data triangulation with the AICPA and NASBA report data points for additional richness to the meaning and validity of the study. The validity then increased, allowing for clear reader transferability (Merriam & Tisdell, 2020).

In conjunction with reality and credibility, Sargeant (2012) suggested that the researcher should extrapolate the data quickly to determine themes. The transcript allowed for the identification of repetitive themes, indicating data saturation (Merriam & Tisdell, 2020; Sargeant, 2012). The presentation of transcripts of the interviews within 2 days and follow up for member check approval assisted in validating. The interpretation of the interview data presents theme generation and confirmability in the research (Braun & Clarke, 2022). Confirmability is the objectivity of the findings, and results are based solely on the data collected versus biases (Merriam & Tisdall, 2020).

Transition and Summary

Section 3 of this study outlined the research methodology, beginning with established ethical considerations and progressing through the detailed data preparation and organization steps. The section concluded by addressing the reliability and validity of the study, thus forming a solid foundation for its trustworthiness and confirmability. The section also provided insights into the methodological decisions that support the study's alignment with its objectives. Hence, the discussion of potential limitations and mitigation strategies can enhance the study’s foundation. Section 4 will present the detailed findings of the research through theme analysis, tables, figures, and expanded analysis. The results will drive the highlights of the study’s contributions to both business

and societal contexts. Recommendations, including identified limitation analysis, will address future research direction. Last, a comprehensive conclusion will anchor and bring the study to completion.

Section 4: Findings and Conclusion

Section 4 will present the findings and conclusions of the study. This section will begin with the restatement of the research question followed by the presentation of findings organized into themes derived from semi-structured interviews, compared with the AICPA and NASBA report, then examined through the TAM. Moreover, this final section will provide business contributions and recommendations, and implications for social change will be followed by recommendations for future research and the conclusion of the study.

Presentation of the Findings

The research question for this study was, what effective strategies do program directors use to integrate data analytics for future professional accountants? With semi-structured interviews, I explored the question through the lens of program directors and faculty in accounting and triangulated themes using external data. The interview data was coded in NVIVO, creating the aggregate themes of initial training strategies and identification, employer development strategy, integration strategy and challenges, and forward-looking strategies. A presentation of the second-order themes and first-order concepts detail the underpinning of the aggregate construct theme development. The findings will then be discussed through the lens of the TAM framework, paying specific attention to PU and PE leading to behavioral intention and use behavior (see Table 1).

Table 1

Themes With Supporting Concepts

Aggregate themes	Second-order themes	First-order concepts
Initial Training Strategies	Professional Organizations	Book Publisher
	Conferences	Pod Cast
	Online Learning	Workshops
	Co-worker centric	American Accounting Association (AAA)
		Department Meeting
		Sharing informally
		AICPA
		Cases
Employer Strategy	Survey	Soft skills
	Network Relationship	Case studies
	Working Group	Integrated learning
	Partnership	Engagement in curriculum
		Technology skills
		Guest Speaking
		Internships
Integration Strategy & Challenges	Instructor Acceptance	Faculty structure
	Past Basic Excel	Metrics
	Balance of Content	Skill Development
	Remaining Current	Learning dynamics
		Support
Forward-Looking Strategies	Metrics	AICPA Reports
	CPA Requirements	Past Antidotal
	Industry Expectations	Technology selection
	Departmental Focus	Research
		Credential approach
		Feedback

Beginning Training Strategies

Richardson and Watson (2021) advocated for a systematic, profession-wide adaptation of technology skills for analyzing datasets. However, the interview findings reveal the initial business strategy themes as an organic, grassroots approach in business practice adoption to technology. The thematic results from the interviews demonstrate that initial strategy development remains highly segmented and individually driven rather than organizationally mandated. Thus, limiting the influence of PE, segmenting behavior with intent for integrating data analytics in the initial strategy to individual use.

Interview K's observation about a "desperate need to incorporate analytics" [with only] "one or two individuals" willing to explore strategies reveals both organizational awareness of analytics' importance and the reality that implementation relies on individual champions. This finding suggests a significant gap between recognizing the need for change and having a structured approach to achieve it. Similarly, Interview H's experience highlighted how professional development often occurs through external channels rather than internal directives, with analytics "emerging more and more at the American Accounting Association (AAA) conference." This conference-based exposure appears to be a primary catalyst for awareness rather than formalized training programs within organizations.

Interview SH further reinforces this pattern of individual initiative, describing an "individual drive to learn" [new technology and discovering] "the power past Excel." This self-directed learning ultimately positioned this individual as an informal knowledge leader who "educated others," creating an ad hoc knowledge transfer system within the

organization. This co-worker-centric, individually driven approach to analytics adoption contrasts sharply with the systematic adaptation recommended by Richardson and Watson (2021). The individual drive suggests that accounting organizations may lack the infrastructure or framework to implement more coordinated technological transformation strategies.

Professional Organizations and Conferences

The interview data reveals a significant pattern in how accounting professionals acquire data analytics skills through professional associations rather than through formal organizational training structures. The prominent role of conferences emerges clearly across multiple interviews, with the AAA Analytics conference specifically highlighted by Interview TM as "by far one of the best conferences to go to just learn and try new software and see what other faculty are doing." This suggests these conferences serve dual purposes: providing technical knowledge and creating communities of practice where professionals can benchmark against peers. Moreover, Kavitha and Joshith (2025) reflected that the PE can create a practical approach to learning, overshadowing the importance of the user friendliness of the software. Ultimately, the exposure in a conference approach prioritized the benefit of the software form an external source, in place of preference for ease of use from an organizational approach.

The interviewees (M, TR, SD, SH, and D) identify professional organizations beyond just the AAA, including the Institute of Management Accountants (IMA) and the AICPA, all contributing to continuing education in technology skills. This indicates a distributed network of professional organizations available to program directors and

faculty to expand data analytics competencies, but to also network and share best practices. Additionally, the continuing education requirements for maintaining CPA credentials function as a mechanism for technological upskilling. As Interview TM noted, “AAA, AICPA, and IMA are all common places” for advanced technology learning. This suggests another avenue to support a technology strategy for technological skill building.

Interview D’s observation about needing to “keep your eyes up and keep your head on a swivel” and “actually want to do it” underscores the self-directed nature of this professional development. This reflects a professional environment where individual initiative and proactive engagement with available resources remain essential to developing advanced analytics capabilities. The wiliness to learn enhances the perceived usefulness and ease of use, leading to a behavioral element to incorporate technology into the course curriculum (Farsawang & Songkram, 2023).

Online Learning

The exploration of webcasts and publisher training material encompassed a secondary theme with a significant pattern in how online learning platforms and resources serve as components in the skill development for accounting professionals adapting to data analytics. The emergence of publisher-provided training resources as valuable learning tools is presented by Interview N who “attends a lot of the webinars and training put on by the book publishers.” The book publishers continue to expand roles beyond textbooks to become active facilitators of professional development in emerging technical areas.

The convenience and efficiency of these online learning modalities emerge as key benefits. Interview H emphasized how working through examples with complete data sets provides a “learning point” that can be accessed “when time permits." This flexibility appears particularly valuable for professionals balancing ongoing skill development with existing work responsibilities. Formal professional organizations are actively supporting this trend, as evidenced by the AICPA's academic resource hub which promotes webcasts and content to upskill faculty (AICPA & NASBA, 2023). The institutional support of the AICPA and NASBA legitimizes online learning as a pathway for on demand professional development.

Interview D suggested characterized online learning as providing “quick and applicable” learning opportunities, which suggests that these resources are valued not just for convenience but for their practical relevance and immediate applicability. This contrasts with more traditional, time-intensive educational approaches. However, Interview TM presented a colleague using Coursera online courses as “a strategic online starting point” indicates that formal online learning platforms are being integrated into professional development strategies. This suggests practitioners continue to construct personalized learning pathways that combine various online resources based on specific needs and circumstances. Collectively, these findings highlight how digital learning resources are complementing conference-based professional development, creating a multi-faceted approach to acquiring data analytics skills that accommodate different learning preferences, time constraints, and specific knowledge needs.

Co-Worker Centric

The last main subtheme under initial strategy development was coworker centric learning. The interview findings point to co-worker relationships emerging as a crucial but double-edged mechanism for skill development. The authoritative bodies in the accounting profession, the AICPA and NASBA have formally recognized the technology skills gap through initiatives like the CPA evolution and the gap analysis report (2021) emphasized "digital acumen development." This aligns with academic perspectives like Aldridge et al. (2020), who advocate for embracing technology to bridge the divide between accounting education and professional practice. Previous subthemes revolved around the external professional development, publisher, and online approach, whereas the final area was the interaction of coworkers interested in learning and discussing findings.

The power of peer-to-peer knowledge transfer emerges prominently in interviews. Interview N identifies "dialog with my colleagues and peers [as] one of the most powerful strategies," while Interview D explicitly contrasts the approach of formal departmental initiatives, noting that communication with peers has been the "main factor," not the department driving the "learning points." The co-worker centric knowledge transfer pattern appears to function as both a solution and a challenge. While centric knowledge creates effective pathways for knowledge sharing among motivated individuals, strictly co-worker centric learning may simultaneously represent a failure of support structures to provide comprehensive training opportunities. The development of

co-worker centric knowledge may alleviate the concerns for perceived use and allow for gradual acceptance translating to a behavioral acceptance over time.

Employer Development Strategy

Richardson and Watson's (2021) observation on accounting firms driving upskilling initiatives demonstrated the industry's active role in promoting accounting education through data analytics integration. This employer-led push suggests a recognition within the profession that traditional educational pathways alone may be insufficient for developing the required analytics competencies. Falgout et al. (2024) extended this understanding by examining the perspective of academic leadership. The findings reflected that successful integration is dependent on both external and internal stakeholders and concurrently adapting employer requirements into the education technology strategy. The dependency on both external partnerships and internal partnership suggests that department chairs must simultaneously look outward for industry guidance while managing internal change processes, creating a new development strategy that is employer integrated.

Network Relationship and Partnership

The building of relationships dominated the theme of employer strategy with the need to build a foundation of networking connections and employer partnerships. Where the AICPA and NASBA (2021) revealed the gap in employer and higher education graduates, the building of a foundation with employers will identify specific areas of technology to increase strategy. Interview K and M discussed the importance of "local employers and professional groups" to build faculty relationships and partnerships, but to

also “engage students” through real working examples. Interview D concurred with strategically working with employers to remain updated with trends, but to also be proactive in engaging in a “work integrated” learning environment and leading to building a student employer networking opportunity. Each reflected on the building of relationships to increase student eventual internships and employment.

Networking and partnerships require an overall departmental strategy to emphasize the importance of employer relationships. All but one interview stressed a departmental strategy where relationships are established, allowing for current students to be considered for internships and eventual employment. Interview N went a step further with reading employer feedback indicating strengths and weaknesses of the student, “specifically looking for things around data rationalization, formulas, analytics and visualization.” Interview TM reflected, “we have spent years now hearing the importance of Excel, I want to teach students more, but the fact remains mid-tier and small firms are still catching up on technology options.” In all cases, fostering professional partnerships and networks is an ongoing strategy component that is needed for industry knowledge, in class components, and connection to the broader industry landscape for internships and career development.

Working/Advisory Group

To maintain a quality program and professional knowledge, continued integration with an advisory group to leverage skill set development in faculty is essential (Falgout et al., 2024). TM reflected, “we hear from our employers over and over again and from our advisory boards.” Interview TR concurred: “I'm using the accounting advisory committee

meeting times to talk with employers and gain insight as to what it is that they're looking for and what their needs are." Interview D concurred, stating that a "working group" is invaluable because "you can ask the hard questions" [and] "a conversation" on growing business trends. Interview N reinforced, "I take that opportunity to really grill them and find out what the workplace is like."

These findings highlight the strategic importance of formalized advisory structures in accounting education, moving beyond ad hoc employer interactions toward institutionalized knowledge exchange mechanisms. The language used by interviewees, such as "grill them," "ask the hard questions," and "gain insight," clearly suggest that advisory relationships serve as critical information-gathering platforms where faculty actively communicate with industry representatives rather than passively receiving predetermined feedback. This represents a significant shift from traditional models where advisory boards might simply approve curriculum to more dynamic knowledge relationship strategies.

Reflection of Integration and Challenges

Integrating data analytics and other technology tools introduces new possibilities and challenges in higher education (Mexhuani, 2025). Second-order themes of instructor acceptance, past basic excel skills, balance of content, and remaining current were the reoccurring statements in the interviews. Falgout et al. (2024) found the integration of analytics was highly dependent on the skill set level of current faculty and of the accounting content familiarization. The familiarity is with the specific area of accounting

and how to incorporate analytics without removing content but adding to the knowledge of the content (Mexhuani, 2025).

This tension between traditional accounting knowledge and emerging technological competencies creates a significant pedagogical challenge for accounting educators. Faculty must navigate the delicate balance of preserving essential accounting principles while simultaneously integrating new analytical approaches that enhance rather than displace core content. The interviews suggest successful integration requires expertise where faculty possess both deep disciplinary knowledge and technological fluency, allowing the identification of meaningful connection points between traditional accounting concepts and modern analytical tools. As accounting programs continue to evolve, professional development opportunities that address integration challenge become increasingly vital, enabling faculty to develop the hybrid expertise necessary to prepare students for a profession where technical accounting knowledge and data analytics capabilities are increasingly inseparable.

Instructor Acceptance

Interview findings further reveal a stratified adoption pattern among faculty, with adoption rates closely tied to career stage, disciplinary specialization, and prior technology exposure. Boyle et al. (2025) found that as older faculty retire or resign, newer faculty have a greater exposure and wiliness to use technology. Faculty who specializes in information systems or who have industry experience with data analytics tools demonstrate higher confidence in integration efforts, while those without such backgrounds express greater hesitation. The PE and PU is a direct reflection on the TAM

model indicating behavior tendency to not only learn but integrate into decision making and proactive use (Venkatesh & Bala, 2008).

The level of behavioral use creates potential inequities in student learning experiences, where exposure to analytics may vary significantly depending on instructor assignment rather than curricular design. Interview D noted, “Some faculty are extremely comfortable with technology and others are resistant to the change,” highlighting the uneven landscape of technology adoption within accounting departments. Interview H and M focused on the age and comfort level of faculty using technology creating a “not interested” in adoption approach in the department initially. This variability suggests the need for systematic faculty development approaches rather than relying on individual initiative alone.

Moreover, the challenges of integration of data analytics extend beyond technical skill development to include pedagogical reimagining. Faculty must reconceptualize accounting education from a predominantly rule-based, procedural approach to one that incorporates more exploratory, creative elements inherent in data analysis work and discovery. This represents a fundamental shift in accounting curriculum, requiring instructors to develop new assessment methods, classroom activities, and learning objectives that effectively merge quantitative analysis with professional judgment.

Aldredge et al. (2021) compared the increase of technology skills to a strategic alternative mindset. Richardson and Watson (2021) concurred with the skillset of accountants transforming into a digital path for growth. Moreover, Interviews D and N both focus on the need for “case study” development with employers to increase critical

thinking and divergent thinking. Interview TM and H concurred with adding “additional technology” integration to show accounting students more options for learning and developing a digital mindset. However, continued curriculum transformation demands significant internal investment in both resources and cultural change. Falgout et al. (2024) found in academic environments a change in material content may include the cost of integrating external business into the process to build technical competencies. Thus, Falgout et al. discussed the need for continual revising for innovation, rather than a single integrated strategy from the beginning.

Past Basic Excel

The AICPA and NASBA report (2021) identified a significant gap between higher education and the professional world regarding technology integration. Data analytics integration remains below 46% and primarily concentrated in intermediate accounting and accounting information courses. Interview H noted that “it was late 2019” when companies began requesting “Excel and firms were beginning to ask for more advanced power BI, and tableau.” Interview TM observed that while most accounting programs teach “basic Excel functions [when it comes to] advanced software”; this is where “the gap begins to show.”

Interview SD described himself as the faculty member who advanced beyond Excel, becoming a leader who teaches others through “conferences, webinars, and in his classes.” This intent to learn and teach aligns with the TAM framework’s concept of perceived usefulness, particularly in integrating real-world applications into coursework.

However, his department still struggles with other faculty “taking the initiative” beyond Excel.

Interview K questioned, “What do we need to do to update our curriculum to make sure we can get our students through the CPA exam into the profession and really educated on this data analytics piece?” Interview TM noted that while Excel is taught as a foundational skill, their program remains siloed regarding software skills, with specific tools like QuickBooks confined to particular courses. These interview themes consistently indicate that while basic Excel is widely utilized, advancement into more sophisticated analytics remains limited.

These findings reveal a significant implementation gap in accounting technology education that extends beyond mere adoption delays to suggest structural and systemic barriers within academic institutions. The data indicate a technological divide where Excel functions as a baseline competency while more advanced analytical tools remain peripherally integrated. This duality aligns with Davis’s (1989) TAM where PE significantly influences adoption rates. Mexhuani (2025) further explained critical key challenges emerge when technology inclusivity is not present in a program. The persistent focus on the use of Excel despite industry signals requesting more sophisticated analytical capabilities suggests institutional inertia where curricula evolve incrementally rather than a transformative, innovative strategic approach.

Interview SD and P demonstrates the critical role of individual champions in technology integration, where innovation often depends on “motivated individual faculty” rather than systematic institutional approaches. This personalization of

innovation creates vulnerability in program sustainability, as the departure of key faculty members could significantly impact a program's technological capabilities. Interview SD reflected that technology competency comes from “dedicated life long learning” and “personal development” through “keynote speaking, book publication, and sharing.” Conversely, the reliance on individual initiative rather than departmental strategy also creates uneven student learning experiences, where exposure to advanced technologies becomes contingent on instructor assignment rather than programmatic design.

Furthermore, the “siloed” approach to software skills noted by Interview TM indicates a fragmented curricular approach where technology competencies are treated as “isolated skills” rather than integrated capabilities applied across the accounting discipline. This compartmentalization conflicts with professional environments where technological tools are integrated throughout accounting workflows rather than confined to specific functions. The emphasis on CPA exam preparation in Interview K’s comments also reveals tension between credential-focused education and emerging professional requirements. This potentially creates competing priorities for curriculum development where traditional exam content may receive precedence over evolving technological competencies.

Kavitha and Joshith (2025) concluded that AI tools should personalize learning, enhance student engagement, while enabling advanced thinking complimenting core material, not replacing core course material. Interview D reflected the “bigger challenge” is that every time something “new comes up,” there is a chance of losing space for content with integration. Interview K presented, “we started with our Principles of

Accounting and Principles of Managerial Accounting. And in principles, we just integrated some basic Excel data analytics." Interview D surmised that "course incorporation without the stretching of content coverage becomes a concern with the short time period and the length of the term."

Interview H had the approach of having as current balance of material in the course, but also "take a moment to show Alteryx, RP8 just for fun so that they realize that availability is out there." Interview TM reflected starting with Excel: "but then we move into Tableau, Power BI, Alteryx, UiPath, and Python." Incorporating technology Having a faculty with extended knowledge past excel allows for a greater incorporation of technology. Interview TM expanded with each graduate accounting course, a strategy to "balance content" and "technology" in every course.

These interviews reveal a fundamental tension that extends beyond technological adoption to encompass deeper questions about the boundaries and balancing of accounting education. Program directors and faculty are navigating on how to align new technology into courses without the loss of accounting core material. Eilifsen et al. (2020) and Hodder and Lucio (2021) furthered with establishing an alignment of leadership buy in, and a balanced integration of analytics into teaching and learning practices. Reflecting on Interviews D, K, and H, the balanced integration of data analytics into the program could reduce the tension of individual course balance and selection by expanding to a full internal department strategy.

Program Director Forward-Looking Strategy

Reflecting on the integration of data analytics and the growing prevalence of AI tools in the professional world, interviewees were asked if their strategy would change implementing technology moving forward. Interview D indicated that the determination of practical tools needs to be made prior to chasing all the new technologies. Interview SD decided to change strategy by incorporate badging into his courses for extra credit to learn new technology past analytics versus removing content in a course outline. Interview SH wants to expand strategy past theory and increase "data mining" where it can show active learning. Interview TM and H both discussed the increase of personal development funds to increase faculty routes to learn. By increasing funds, then more learning process can happen and translate into continued upgrades to courses.

Interview N focused on what data publishers are providing and being aware of where you are teaching, selecting data students will resonate with and use it. In place of "I bought a widget," use a "flower shop that has 25 locations, different types of flowers." Interview N contended that "if they can relate to the topic, they can learn the technology." Interview TR and TM both reflected on the importance of strategy change moving forward with keeping student resume building in mind as more "comprehensive cases" are developed to enhance learned skills of graduates.

These interview findings reveal an evolving landscape of strategic approaches to technology integration in accounting education. The innovative strategies initially address the core competencies and how to add a quick component to the pedagogy. Interview K and H both discussed specific course integration, Interview D had the emphasis on

determining “practical tools” before “chasing all the new technologies.” As time progressed from initial implementation, to now, interview H reflected with the “retirement of older staff,” full department integration of “new technology” is continual. The pause in individual quick adaptation is showing a progression for the initial strategy into a more deliberate thoughtful approach to incorporate feedback and compliment course objectives. A new dynamic strategy of a program integrative learning experience is a divergence from Dzuranin et al. (2018), where data analytics is integrated in singular courses. The dynamic approach allows programs to maintain focus while still preparing students for technological changes in the profession.

Interview SD’s badging strategy represents a particularly innovative response to curriculum constraints. By creating parallel learning pathways through strategic optional badging opportunities, faculty can effectively expand the learning environment beyond traditional course structures without sacrificing core content coverage. This approach creates flexible learning paths that recognize student interest and ability, potentially increasing engagement with technological tools while preserving essential accounting knowledge. The flexible learning approach integrates TAM allowing for individual technology acceptance with various levels of adoption (Mexhuani, 2025).

Interview N’s stretched technology acceptance by placing an emphasis on contextual relevance through familiar data sets. By utilizing relatable examples drawn from students' lived experiences, faculty can reduce the tension associated with adopting new technology while simultaneously mastering new technological tools and accounting concepts. This approach recognized that technology adoption is facilitated when students

perceive immediate relevance and application to contexts they understand. Specifically, interview N stressed, no matter the class, “it’s making a human connection of some kind.” The strategic selection of familiar contexts creates cognitive scaffolding that supports the transfer of technological skills to professional environments, addressing the persistent challenge of knowledge transfer between academic and professional contexts.

The strategic emphasis on “resume building” and “comprehensive cases” articulated by Interviews TR and TM indicates a fundamental shift toward an outcomes-based curricular design that prioritizes demonstrable professional capabilities over course completion. This approach directly addresses the skills gap identified in the AICPA and NASBA report (2021) by creating more authentic assessment experiences that mirror the integrated nature of technological and accounting knowledge in professional practice. By designing comprehensive cases that require students to apply technological tools to complex accounting scenarios, faculty create learning experiences that develop both the technical and contextual knowledge required for professional success, potentially reducing the transition challenges graduates face when entering the workforce.

Metric Identification

Each interviewee was asked how they measured the success of implementing analytics and closing the employer and higher education gap in their respective programs. The results provided the same theme of only anecdotal awareness, but no metric to solidly state an achievement was made. Interview D contended it is a difficult measure to make past a qualitative approach “discussing with employers and alumni.” Interview K also mentioned discussion with employers as the only formal practice at this time: “we

just keep the channels of communication open." Whereas interviews H, TM, M, N, and P agree qualitative is the only way at this point because each employer is so different in scale and requirements. Interviews SD, SH, and TR also answered anecdotally, but reflected questions are asked in all employer events and through career services.

This consistent reliance on anecdotal assessment methods across all interviews reveals a significant measurement gap in accounting education's approach to technology integration. Despite the substantial investments in curriculum development, faculty training, and technological infrastructure, programs lack robust mechanisms to evaluate the effectiveness of these investments beyond informal feedback channels. This absence of empirical assessment frameworks represents a fundamental disconnect between the quantitative analytical skills accounting programs aim to develop in students and the qualitative, impression-based methods used to evaluate program effectiveness in developing these same skills.

The challenge of measurement appears rooted in several factors revealed through the interviews. First, the heterogeneity of employer requirements noted by interviewees H, TM, and N creates significant complexity in establishing standardized metrics that apply across diverse employment contexts. Second, the reliance on "keeping channels of communication open" suggests a reactive rather than proactive assessment approach where programs respond to employer feedback rather than systematically evaluating specific learning outcomes. Third, the institutional separation between academic departments and career services mentioned by interviewees SD, SH, and TR indicates

potential structural barriers to comprehensive data collection that would connect educational interventions with employment outcomes.

This measurement gap has significant implications for continuous improvement efforts in accounting education. Without specific metrics beyond anecdotal feedback, programs face challenges in identifying which pedagogical approaches most effectively develop technological competencies, determining optimal resource allocation for technology integration, and demonstrating return on investment for technological infrastructure. The absence of robust assessment mechanisms also complicates accreditation processes and educational research that could advance understanding of effective technology integration practices across the field.

CPA Requirements

The AICPA, CPA requirements for continuing education and the changes with the CPA evolution provided a catalyst for both strategy development for analytics integration, but also for program directors and faculty to increase skill development. The AAA and other professional networks, large accounting firms (PWC, EY, KPMG), and book publishers were the first areas the interviewees presented as driving learning. Aldredge et al. (2020) contended closing the professional gap with competencies that drive curricula aligned with the demands of the technology skillset in the CPA licensure exam is an essential measure. For competencies to drive curriculum, a fostering of AI has to happen at the higher education level, training all faculty on the tools and integration (Kavitha & Joshith, 2025).

Although the drive began with the larger firms, interview K reminds us that we all need to do better moving forward to not exclusively consider firm needs and balance with all “corporate and firm” industry CPA needs. Interview N reminded that analytics is the “flavor of the month” right now and we need to keep the larger picture in mind, remain in tune with the industry and be able to adjust and adapt quicker than before.

Business Contributions and Recommendations for Professional Practice

This subsegment is focused on the applicability of the findings compared to the ability to develop an implementation strategy for technology integration for program directors in higher education. The gap between higher education and professional requirements is well documented, but strategies to reduce the gap are still needed. The findings of this study are discussed from a two-prong approach, applicable findings for program directors and applicable strategy findings for reducing the professional and educational gap overall.

Applicable Findings for Program Directors

Program directors in accounting education face challenges in implementing technological innovations into the product and incorporating formalized training programs within the organization. The following findings provide strategic insights for effectively navigating these challenges. The research reveals a critical need for program directors to foster systematic approaches to technology integration rather than relying on individual champions. The results can be transferable to conference presentations and future research initiatives.

As evidenced in the interviews, “a singular person or two people driving the process of learning” creates vulnerability in program sustainability. Program directors should develop formal structures that distribute responsibility for technology integration across the department while providing appropriate recognition and support for early adopters who can serve as peer mentors.

Creating structured, ongoing dialogue with employers emerges as essential for program relevance. Rather than casual networking, program directors should establish formalized feedback loops that continuously calibrate curriculum with industry needs. Interview N’s methodical analysis of employer feedback demonstrates an evidence-based approach that program directors can emulate, particularly focusing on data analytics skills that represent evolving technical demands of the profession.

The technology adoption disparities between large and small accounting firms identified by Interview TM creates an educational challenge requiring strategic response. Program directors should consider developing tiered educational approaches that address both advanced technological skills for students targeting large firms while maintaining strong foundational skills for those entering smaller practices. This differentiated approach acknowledges the varying technological environments graduates will encounter.

While the TAM framework identifies PU as driving technology adoption (Venkatesh & Davis, 2000) PE remains a significant barrier. Program directors must allocate sufficient resources, including costs, toward reducing the time and effort the faculty must invest in learning new technologies (Richardson & Watson, 2021). This

includes providing dedicated professional development time, technical support, and recognition of technology integration efforts in promotion considerations.

The research indicates that the most effective learning occurs at the intersection of academic theory and professional practice. Program directors should prioritize the development of “work integrated” learning environments that blur traditional boundaries between academia and industry. These co-production models of accounting education create authentic learning experiences, develop professional socialization, and establish career pathways for students (Bakarich et al., 2021).

Moving beyond anecdotal assessment represents a critical opportunity for program directors. Developing multi-dimensional evaluation frameworks that incorporate direct measures of student technological competencies, longitudinal tracking of employment outcomes, systematic employer feedback mechanisms, and comparative benchmarking would enable more evidence-based decision-making. Such comprehensive assessment approaches provide clearer signals of progress in closing the gap between academic preparation and professional expectations.

The research suggests that accounting faculty often prefer to learn technology skills through peer-to-peer exchange rather than formal training. Program directors might benefit from formalizing and supporting these peer learning networks, providing resources and recognition for knowledge sharing activities rather than imposing entirely new training structures that may not align with faculty learning preferences.

By implementing these evidence-based approaches, program directors can more effectively lead their departments through technological transformation, ensuring

graduates possess the analytical skills increasingly demanded by the accounting profession while maintaining excellence in core accounting education.

The progressive integration approach described by Interview K, beginning with "basic Excel data analytics" in principles courses, suggests a scaffolded curriculum design that attempts to build technological competencies in parallel with accounting concepts. This scaffolded approach aligns with recognizing that students must first master foundational accounting concepts before engaging with more complex analytical applications. However, this incremental approach may inadvertently reinforce a false bridge between "content" and "technology" rather than presenting them as integrated components of modern accounting practice.

Interview TM's comprehensive strategy of balancing content and technology "in every course" represents a more transformative approach to curriculum design where technological tools are treated as essential components of disciplinary knowledge rather than supplementary skills. This approach requires significant faculty development and curricular coordination but may better prepare students for professional environments where technological and accounting knowledge are inseparable. The contrast between Interview H's exposure-focused approach and Interview TM's comprehensive integration highlights the spectrum of responses to technological change, reflecting varying institutional capacities, faculty expertise, and philosophical orientations toward the evolving boundaries of accounting education.

Reducing the Professional and Education Gap

Reducing the professional and educational gap is more than one element in a strategy. Prem (2022) reinforced with the need to find the critical success factors and creating that urgency to close the gap. The interview data reveals that while departments may initially convene to discuss gaps and analytics integration, the actual learning and implementation work typically falls to a singular person or two people driving the process of learning. This suggests a significant disconnect between organizational recognition of the need for change and the allocation of resources to support widespread skill development. The reliance of individual champions rather than a departmental approach can be viewed as a positive subtheme, but also a negative challenge. The development of a peer-to-peer learning internal network can function effectively in closing learning gaps and providing a TAM model of showing ease of use, eventually leading to a behavioral departmental change (Falgout et al., 2024). However, if the individual drivers leave, or other faculty are unwilling to learn and incorporate, the challenge remains.

The findings are clear that program directors would benefit from working with employers directly to determine relevant technology, provide current examples, and proactively engage with the industry to understand needs. Aldredge et al. (2021) stressed the gap can be reduced with the promotion of a skillset shift from theory to a practitioner's mindset. The mindset shift could create an integration of education and employer perspective needs. Baldwin et al. (2023) concurred with developing a mindset to adapt to technology can progress faculty and students to a more strategic design

thinking approach. In turn this can create a technology behavior direction to partnership and networking communities to reduce the gap and essentially open more opportunities for professional development.

Implications for Social Change

Moravec (2013) proposed that an increase in technology feeds into social change, which loops back to increased disruptive technology development. Moravec and Martinez-Bravo (2023) furthered by evaluating how the educational ecosystem could influence technological and social change in human behavior. Thus, program directors could create positive social change by increasing data analysis and encouraging the role of technology and business in social awareness and change.

This study provides the practical ways to implement a more holistic department presentation to adopt technology to faculty continuing development and students learning experience. The creation of a curriculum restructured to reduce the technology gap between the profession and education could allow for a transition to a deeper understanding of financials in a business (Aldredge et al., 2021). A graduate with a digital mindset provides a deeper insight that could enable the financial strategy to increase environmental, social, and governance (ESG) initiatives (Zin et al., 2022). The AICPA (2023) reflected that ESG reporting, and assertions are becoming standard notations to the Securities and Exchange Commission (SEC) in business filings.

The AICPA and NASBA (2021) report data exemplified the need for increased technology exposure to the student. Enhancing faculty technology behavior increases the transference into the curriculum, thus, expanding technology growth in the student base.

The transition into the professional landscape creates a backfill of technology adaptive professional accountants desperately in need (AICPA & NASBA, 2023). Having technology adaptive professional in the accounting landscape increases the transparency of company financial reporting, impacting the reliability for all external readers.

Recommendations for Further Research

This qualitative pragmatic inquiry aimed to explore effective strategies for program directors to integrate data analytics into an accounting program. The limitations identified by the program director and faculty experience level in program change could impact the strategy to implement technology changes. Using Ravitch and Carl's (2022) approach to a smaller sample size, I was able to focus on identifying participants with relevant experience prior to interviewing for the study. However, remembering the details of analytics implementation remained as a possible limitation of the study. Therefore, the recommendations for further research include deeper questioning, integrated employer faculty training.

For this study, the main limitation was with the years of experience of the program director or faculty member. To answer the research questions, this item became imperative. Where all participants clearly met the qualifications for the study, a few interviewees had to pause to remember the initial strategy questions. Deeper probing questions could have allowed for more recollection and rationale for the integration approach used. Other qualifiers could also have been used to distinguish if the interviewee was solely with an undergraduate program, graduate program, or both.

Accounting programs can be in the undergraduate to graduate program, requiring different levels of material and skill development.

Additionally, this study was developed to identify initial strategies and explore moving forward strategies for technology integration. The results provided multiple examples of case use and opportunity for certification during the course. A recommendation for future research is around the use of course training elements to increase the PU and PE with faculty and employer integrated applications to learning technology and strategy development. Hence, a future study could replicate this study in different contexts to gather specific area detail expanding on technology acceptance.

Conclusion

This qualitative pragmatic inquiry was to identify and explore the effective strategies accounting program directors and faculty use to integrate data analytics into accounting products, thereby meeting employer's requirements and remaining competitive. The targeted population was program directors with two or more years of accounting program change experience to meet business demands. The study findings highlighted initial strategy development that was divergent from internal departmental training and focused more on individual training and external resources. The themes developed through interviews captured insight into the initial training strategies, employer development requirements, challenges in integrating data analytics, and potential forward-looking strategies.

The study offers program directors and faculty strategies for future improvements. Technology is an area of continued development and growth. Reflecting on the insights

of others can help establish a best practice baseline for future implementations. Specifically, allow for multiple opportunities to craft internal training and external training strategic plans. The establishment of an integrated learning perspective by a dual approach of professional development and higher education curriculum enhances produces graduates ready for professional requirements, closing the skillset gap. Moreover, the enhanced graduate ability strengthens the professional landscape, backfilling a an industry gap, and increasing the strategic competitiveness of a firm.

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Appendix: Pragmatic Inquiry Protocol

Research Study Title: A Program Director's Strategies for Integrating Data Analytics in the Curriculum.

The sample questions for the study are:

1. How did you integrate data analytics into the accounting curriculum?
2. How did you determine employer expectations?
3. What challenges did you face in expanding the use of data analytics into the curriculum?
4. What strategies for training/professional development do you incorporate for faculty?
5. How did you measure if the integration of data analytics met employer needs?
6. How did partnerships with employers and industry groups help provide better insights to inform program design and strategy?
7. What data sources do program directors find most valuable for understanding skill gaps in employer needs?
8. What changes would you make to your implementation strategy of data analytics for future technology implementation strategic plans?

Interview Procedures

- Contact participant to remind of zoom date and time.

• The zoom interview duration will be 30 minutes at the date and time convenient for the participant.

- I will present nine interview questions and follow up with some probing questions as needed.
- With your permission, I will record the interview using zoom and other devices.
- The purpose of recording is for transcription and the ability to provide you with a copy to verify your words within two days of the interview. This will also be considered a validation or member checking of the interview for accuracy.
- I will follow up a few days later with an email to confirm the receipt of the interview transcript and for any changes and for approval.

I want to thank you for providing your time and sharing your experiences with me.