PROMOTING INCLUSIVE ACCOUNTING EDUCATION THROUGH THE INTEGRATION OF STEM PRINCIPLES FOR A DIVERSE CLASSROOM

Abstract

In recent times, accounting education has explored many innovative approaches to address the collective needs of students. Integrating STEM principles in accounting education promises an increased potential for technology-driven solutions, enhanced learning strategies, and inclusivity. However, because of the scarcity of research, the implications of STEM accounting on student engagement and academic performance remain unexamined. This limitation also extends to the impacts of STEM integration on inclusivity and diversity as regards ethnicity, gender, and socio-economic background.

Hence, this study offers an in-depth investigation of the impacts of STEM integration on student engagement and academic performance in accounting education. It also explores the influence of STEM integration on inclusivity and the attraction of diverse students to accounting programs.

Using survey questionnaires, this study identified 342 accounting professionals with five to twenty years of experience. Cronbach's coefficient was used to test for the reliability of the collected data and linear regression was employed to test the hypotheses. The study revealed a positive correlation between STEM integration and student academic performance and engagement. Results also showed that integrating STEM principles into accounting education positively impacted inclusivity and attracted a diverse classroom.

This study recommends that accounting education policymakers develop a curriculum that aptly incorporates STEM concepts into accounting courses that would appeal to students from diverse backgrounds; a student-centered curriculum should also be adapted to correspond with all learners' varying STEM proficiency levels; and the accounting faculty of tertiary institutions should play a vital role in STEM integration and

inclusivity by undertaking training sessions on STEM-related skills, inclusive teaching methods, and cultural sensitivity.

INTRODUCTION

Background of the Study

In the era of rapid technological progress, shifting economic conditions, and growing demands for inclusivity and diversity, education professionals are always looking for new and creative ways to adapt to the requirements of both society and students. Accounting education is at the intersection of these revolutionary forces, a foundational field that shapes the next generation of financial professionals (George, 2021). Accounting education must adapt to these changes to continue being effective and sensitive to the needs of the modern world.

The incorporation of the "STEM" concepts into non-STEM fields, such as accounting, is one such adaptation that is gaining traction in educational debate (Anderson, 2022). STEM integration can improve student engagement, enrich educational experiences, and equip graduates for a workforce that is becoming more and more interdisciplinary and technologically savvy (Miller, 2023). The potential for improving the preparation of future accountants with a broad skill set that includes critical thinking, quantitative and analytical expertise, and adaptability to modern financial technologies exists at the nexus of STEM education and accounting education (Jones, 2021).

According to Davis (2023), there is a rising need for higher education to prioritize accounting studies since it equips students with the information and abilities needed for lucrative employment in business, finance, and related disciplines. The accounting industry is always changing, depending more and more on data analysis, technology, and multidisciplinary expertise. The difficulty of adjusting and being relevant in a quickly evolving environment is one that accounting education must overcome to stay up with these developments.

The main focuses of traditional accounting education have been financial reporting, auditing methods, and accounting concepts (Brown, 2019; Olaniyi &Omubo, 2023). Although these foundational skills are still necessary, employers seek graduates with a wider range of abilities, such as data analysis, critical thinking, problem-solving, and

flexibility. These abilities closely correspond with STEM tenets, which are acknowledged as essential to preparing students for the modern workforce (Francisco, 2020).

It is imperative that the global business climate and accounting education both evolve (Olaniyi et al., 2023). Integrating STEM principles into accounting education holds potential for teachers to better educate their students by applying STEM principles and ensuring they possess the analytical and technical abilities required for accomplishment in today's financial business, along with a strong foundation in accounting (Wilson, 2020).

Problem Statement

Fostering inclusivity and supporting diversity is crucial in accounting education (Smith, 2020). STEM (Science, Technology, Engineering, and Mathematics) concepts are not fully integrated into traditional accounting education procedures, which may lead to an underrepresentation of different student populations (Johnson & Brown, 2019). Essentially, a lack of diversity in the accounting field may be partly ascribed to a curriculum that does not sufficiently integrate STEM subjects (Adams, 2018). Furthermore, the pedagogical quality is compromised when diverse learning methods and backgrounds are not accommodated (Taylor, 2017).

To address these problems, this study examines how STEM concepts might be included in accounting instruction. The objective is to create a learning environment in academia that values diversity and accepts a wide range of experiences and viewpoints (Wang, 2021). Diversification in the accounting industry can be promoted by providing accounting scholars with STEM proficiencies, enabling them to navigate the rapidly changing financial world with the requisite knowledge and skill set (Brown & Lee, 2022). The fundamental target is to improve the overall learning process so that students, regardless of their academic background, have the knowledge and skills necessary to succeed in accounting (Clark, 2019).

Research Aim

This study investigates the effects of integrating STEM (Science, Technology, Engineering, and Mathematics) principles into accounting education. It focuses on its impact on student engagement, academic performance, diversity, and inclusivity within accounting programs.

Research Objectives

1. To ascertain the impact of integrating STEM principles in accounting education on student engagement and academic performance in accounting education.
2. To discover if integrating STEM principles attracts a more diverse student body to accounting programs and how it influences inclusivity regarding ethnicity, gender, and socio-economic background.
3. To explore the benefits of promoting inclusive accounting education through integrated STEM principles for a diverse classroom.
4. To recommend strategies for integrating STEM principles into accounting education to ensure inclusivity and accessibility through gender, race, and ethnic diversity.

Hypothesis

1. Integrating STEM principles into accounting education positively impacts student engagement in accounting education.
2. Integrating STEM principles into accounting education positively impacts student academic performance in accounting education.
3. Integrating STEM principles attracts a diverse body of students to accounting programs.
4. Integrating Stem principles into accounting education has a positive influence on inclusivity.

Literature Review

STEM Principles in Education

STEM principles in education comprise a multidisciplinary approach that converges the concepts of science, technology, engineering, and mathematics to encourage comprehensive learning (Takeuchi et al., 2020).

These principles are established to nurture creativity, innovative thinking, and student collaboration using a holistic educational approach. They are underpinned by integrating scientific methodologies, computerization, and hands-on projects to promote extensive learning. STEM education emphasizes the development of creativity and scientific inquiry to prepare students for a rapidly digitized world (Thibaut et al., 2018).

STEM principles are integrated into multiple academic fields through a transdisciplinary and inclusive approach. With its problem and project-based learning system, learners are exposed to realistic challenges that require innovative and cross-disciplinary solutions. For example, digital technologies such as data analysis are used in art and social science to communicate and visualize research findings (Smith et al., 2022; Olaniyi &Omubo, 2023). Specific fields such as history, business, and accounting rely on STEM principles for data-driven decisions and general technological advancements (Martín-Páez et al., 2019). Furthermore, interdisciplinary programs provide an opportunity to harness diverse disciplines' analytical and computational advantages. As such, this system of education encourages collaborative experimentation and adaptability.

The integration of STEM principles is highly relevant in education. Its encouragement of sustainable practices promotes analytical and logical thinking within a learning environment. With a curriculum complemented by scientific experiments and constructive projects, students can learn to assess evidence and approach challenges with strategic inquisition and intellectual depth (Li et al., 2019).

Additionally, by incorporating stem principles into education, students become equipped with the creative knowledge and problem-solving skills necessary to provide incisive and practical solutions to real-world problems (Ortiz-Revilla et al., 2022). STEM education also nurtures skill development by equipping students with technical and digital skills essential for expanding career prospects and honing an adaptive attitude towards continuous learning and technological advancements (Tsoukala, 2021; Oladoyinbo et al., 2023).

The Changing Landscape of Accounting

According to Han et al. (2023), integrating technological advancements, including blockchain, artificial intelligence (A.I.), and fintech, has presented the accounting profession with various prospects and challenges. For example, financial technology (fintech) significantly transforms financial transactions by automating numerous accounting processes and procedures (Olaniyi et al., 2023). Highlighting the significance of these evolutions in the field of accounting, Kokina and Blanchette (2019) argue that automating financial transactions may increase efficiency and reduce the occurrence of human errors. Similarly, the amalgamation of artificial intelligence and blockchain technology within accounting systems may expedite data processing and enhance its reliability (Centobelli et al., 2022). However, Kroon et al. (2021) contend that besides adapting to the altering roles and responsibilities of the profession, accountants must acquire novel abilities and skills to utilize these technologies effectively. Moreover, the notion that accountants are solely tasked with performing numerical calculations has become obsolete, given the growing demand for accountants to possess analytical and technological proficiencies (Brunetti et al., 2020).

According to Nielsen (2022), accountants must possess extensive competencies and understanding to effectively navigate the complexities of contemporary financial reporting and administration. Dumay and Guthrie (2019) state that a multidisciplinary education encompassing economics, law, finance, and accounting is essential for accountants. Thus, accountants can then evaluate accounting records in the context of an organization's operations. Accountants who have developed and refined their

multidisciplinary proficiencies are more adept at evaluating prospects, executing resilient controls, and contributing to formulating strategic decisions (Mintchik et al., 2021; Abalaka et al., 2023).

According to Kanellos and Nikos (2022), modern accountants are indispensable in a knowledge-based economy because they assist in transforming financial data into useful insights. However, robust analytical abilities are essential for accountants to assist management in making informed decisions grounded in precise financial data (Bag et al., 2021). Furthermore, contemporary accountants must possess proficiency in digital accounting systems to optimize financial processes, enhance precision, and optimize output (Kokina et al., 2021).

Integration of STEM in Accounting Education

Incorporating the STEM (Science, Technology, Engineering, and Mathematics) concepts in accounting education has garnered increasing attention recently (Smith, 2022). This pattern shows that the accounting industry is evolving and that transdisciplinary skills, technological know-how, and data analytics are becoming increasingly important (Jones & Brown, 2021; Olaniyi et al., 2023). The body of research indicates that the need to equip accounting graduates with a wider range of skills for a changing labor market motivates this integration (Adams, 2020). Scholars and instructors have investigated diverse approaches to integrate STEM ideas into accounting curricula, such as utilizing data analytic instruments, technology-based role-playing, and collaborative projects (Harris et al., 2023).

Various main objectives drive the inclusion of STEM in the study of accounting. Initially, it aims to give accounting students the technical aspects and analytical abilities needed in a world dominated by data (Johnson, 2021). It also seeks to improve pupils' critical thinking and problem-solving skills (Wilson, 2020). The integration also addresses the growing need for accountants with the ability to work across intricate financial systems, evaluate sizable datasets, and support the creation of cutting-edge financial technology, as expressed by employers (Roberts & Lee, 2022). Ultimately, the primary goal is to

guarantee that graduates of accounting programs are skilled in conventional accounting procedures and equipped to flourish in a corporate climate that is changing quickly.

There are several different theoretical underpinnings for incorporating STEM concepts into accounting curricula. Educational theories that prioritize problem-based learning, experience learning, and active learning are the sources they draw from (Brown, 2023). In addition, learning psychology ideas like cognitive theory apply to creating successful STEM-integrated accounting curricula (Clark & Green, 2021). Furthermore, in line with the tenets of STEM education, the relationship between accounting and STEM areas depends on the perception of accounting as a numerical and data-driven discipline (Parker, 2020). These theoretical underpinnings offer the structure for creating instructional strategies that successfully integrate STEM and accounting education.

Social Learning Theory

According to the Social Learning Theory, which Albert Bandura developed, people learn new actions, attitudes, and information by seeing and copying others in their social surroundings. The importance of relationships in influencing human behavior is emphasized by this idea (García, 2021).

A fundamental idea of this theory is observational learning, which is the process by which people pick up new skills by imitating the actions, attitudes, and outcomes of others (Martinez, 2018). The observed behaviors by these models might be either positive or negative, and they can range from peers to authoritative people. The social learning theory can foster inclusion in accounting education (Santos, 2020). The classroom environment, which provides opportunities for students to watch and engage with different peers, promotes the development of diverse attitudes and actions. Students get knowledge from one another and the instructor, broadening their horizons and comprehension of other people's experiences and backgrounds (Houston, 2021).

Additionally, the social learning theory supports the integration of STEM ideas into an inclusive classroom to improve student engagement since collaborating and observing with peers with different perspectives and backgrounds can foster a dynamic learning

environment that encourages inquiry, critical thinking, and teamwork (Lopez, 2023). The importance of social interactions and observation in the process of acquiring new behaviors and information is emphasized by the Social Learning Theory, thus encouraging diversity and building a dynamic, inclusive classroom, especially for STEM-related courses (Ramirez, 2021; Omogoroye et al., 2023).

Critical Theory

Critical theory is a fundamental social science and philosophy framework that examines social structures, power dynamics, and inequality (López, 2020). It examines the distribution and use of power in society, frequently exposing inequalities and covert hierarchies. Ideology critique highlights how ideologies can support inequality, and praxis, the notion of bringing about change via critical thought and action, are important ideas (Adebiyi, 2023).

Critical Theory offers an insightful perspective on concerns of discrimination and injustice in the framework of accounting education. Closely examining the power structures draws attention to how systemic and historical prejudices may impede inclusion and diversity in curricula and classrooms. It makes it possible to look more closely at the economic and social structures that lead to differences in opportunities and access (Kim, 2019).

Moreover, incorporating STEM principles challenges the conventional wisdom in accounting education. The focus of STEM on technology, data analysis, and problem-solving expands the range of abilities needed in accounting. In addition to adding diversity to the field (Olaniyi et al., 2023), the critical theory outlines a broader spectrum of students with varying backgrounds and skill sets, upending established power dynamics through integrating STEM principles into accounting education, thus fostering change, diversity, and equity (Garcia, 2022).

Synergy Between Social Learning and Critical Theory

Social Learning Theory emphasizes the significance of interactions and shared experiences in learning. It highlights the role of observational learning, peer influence, and collaborative environments in shaping individuals' understanding and behavior (Kowalczyk, 2020). Critical Theory, on the other hand, delves into power dynamics, ideologies, and structural inequalities within society. It offers a lens to scrutinize how these factors influence educational systems and curricula, potentially perpetuating exclusion (Dubois, 2019).

In the context of inclusive accounting education, the fusion of these theories can offer a more comprehensive understanding. Social Learning Theory elucidates how peer collaboration and mentoring can foster inclusivity by nurturing a supportive environment for diverse learners (Nguyen, 2021). Critical Theory aids in recognizing the systemic barriers and biases that might hinder inclusive practices (Mikhailov, 2022). By combining these perspectives, educators can better comprehend the challenges and opportunities for inclusivity in accounting education, paving the way for more effective strategies.

While distinct in their emphasis, the synergy between Social Learning Theory and Critical Theory presents an opportunity to create a more holistic framework for fostering inclusivity in accounting education. This holistic approach can empower educators and institutions to develop comprehensive strategies that address the immediate learning environment and the underlying societal structures that impact inclusion (Mill, 2020).

Though the theories differ in focus, the convergence of social learning and critical theories offers a chance to develop a more comprehensive framework for promoting inclusiveness in accounting education. By using this holistic approach, educators and institutions can be empowered to create all-encompassing plans that address the underlying societal factors that affect inclusion and the actual learning environment.

Integrating STEM in Accounting Education in the U.S.

The STEM field encompasses diverse and well-funded disciplines globally. Surprisingly, accounting and finance weren't recognized as STEM components until recent legislative

actions by the U.S. Senate and House. In 2021, the American Accounting Association pushed for this designation, further reinforced by universities receiving STEM recognition for accounting degrees. This reclassification might raise eyebrows initially, but examining its rationale, rooted in the evolving landscape of the field, reveals its legitimacy. While the focus has been on K-12, implications extend to higher education, aligning with the shift toward preparing students for tech-driven careers.

Young Americans lack financial preparedness, with schools and parents often falling short of financial education. According to a study (Juneja & Rocher, 2022), it's no secret that young Americans are woefully unprepared for financial adulthood. Congress's recognition of the importance of accounting in middle and high school can empower the youth to navigate the complexities of financial adulthood. Failing to grasp personal finance basics perpetuates a cycle of poor decisions, restricting social mobility.

Impact on Student Engagement and Academic Performance

Numerous studies have examined the correlation between STEM integration and student motivation and interest in various classroom settings. For example, Signorini and Pohan (2019) evaluated STEM integration in K-12 education, illustrating the potential motivational and engagement-enhancing effects of integrating STEM in accounting programs. In a study investigating pre-college STEM integration, Wang and Chiang (2020) demonstrated that the attitudes and behaviors of educators exert a substantial influence on the level of enthusiasm and interest that students develop toward the impact of STEM integration in accounting disciplines. Furthermore, an examination will need to be conducted to determine which variables affect the interest and motivation of students in STEM-integrated accounting courses. Highlighting the critical effect of integrating STEM into other disciplines, Miao et al. (2022) state that student-student partnerships, teacher-student interactions, and group tasks substantially increase student interest and motivation, according to their research.

According to Smith et al. (2022), integrating STEM principles into conventional subjects enhances students' comprehension and practical application of these principles in

alternative settings. As an illustration, Clark et al. (2021) observed that sixth-grade pupils who engaged in a STEM endeavor encompassing the conceptual understanding and building of paperwork bridges demonstrated heightened engagement and comprehension of scientific principles. However, this suggests that integrating STEM disciplines into the curriculum may give students a more comprehensive and applicable education, enhancing their academic achievements. Furthermore, examining the outcomes of STEM integration is essential to devise effective approaches for its implementation in educational settings (Margot and Kettler, 2019). As Brown and Bogiages (2019) stated, implementing STEM in the classroom requires that educators engage in ongoing professional development.

Diversity and Inclusivity in Accounting Programs

According to a study by Baran et al. (2019), incorporating STEM principles into high school life science improved student learning outcomes and attitudes toward STEM courses. The implications of this finding suggest that STEM integration might attract students from a more diverse array of backgrounds to accounting and other STEM-related fields. Therefore, integrating STEM principles into accounting programs may broaden diversity by encouraging learners to think creatively and emphasizing practical applications. Whitcomb and Singh (2021) further argue that diverse racial and ethnic groups may have varying numbers and proportions of pupils enrolled in STEM disciplines. However, this disparity can be mitigated by integrating STEM disciplines and incorporating instructional practices and content that is culturally pertinent and resonates with students from diverse backgrounds (Abu Khurma et al., 2022). Furthermore, STEM inclusion has the potential to mitigate detrimental gender biases by promoting and fostering engagement from every student, irrespective of gender (Schmader, 2023). Also, STEM integration fosters an inclusive and supportive learning environment that transcends gender distinctions, advancing gender equality (Wright and Delgado, 2023).

Moreover, STEM integration can assist in reducing these disparities by providing students of all socio-economic backgrounds with opportunities for experiential and

hands-on learning in STEM disciplines (Bicer and Perihan, 2020). However, students can develop the problem-solving and critical thinking skills required to accomplish STEM fields by applying classroom knowledge to real-world scenarios and challenges.

Diem et al.'s (2023) research emphasizes the importance of incorporating cultural diversity into accounting curricula to adequately prepare students for the complexities of operating in a globally interconnected and culturally diverse business environment. The opportunity for students to study business and accounting in a foreign culture is afforded through international exchange programs. However, by introducing learners to novel concepts and philosophies, these initiatives foster inclusivity and diversity in accounting programs (Harrison et al., 2020). Furthermore, to advance diversity within accounting education, it is critical to implement inclusive instructional materials and pedagogical approaches. However, Eguchi et al. (2021) posit that incorporating various viewpoints into the classroom improved students' readiness for an increasingly diverse workforce and led to deeper learning.

Benefits and Challenges of STEM Integration

There are numerous potential benefits to integrating STEM principles into accounting education, including improved student learning and a closer match with the changing needs of the labor market (Rodríguez, 2019). Firstly, incorporating practicality into the curriculum promotes higher levels of student involvement. Students are more likely to discover relevance and excitement in their studies when accounting, mathematics, and data analytics concepts are demonstrated in real-world contexts, encouraging them to investigate accounting subjects more zealously (Hernández, 2020).

Additionally, using STEM principles promotes the growth of critical thinking abilities. Accounting, typically considered a rule-based field, can gain from an analytical approach that enables students to comprehend financial systems' fundamental mechanisms and think beyond the numbers. This change allows people to tackle challenging financial issues with creative, problem-solving attitudes (Li, 2018).

Crucially, adding STEM into accounting curricula strengthens students' aptitude for using technology. Proficiency in software programs and data analysis is essential in an

increasingly digital environment (Olaniyi et al., 2023). Combining the teaching of these abilities with accounting concepts guarantees that graduates are equipped to handle the technological demands of the workforce, boosting their employability and flexibility across a range of sectors (Gómez, 2021).

However, there are drawbacks and criticisms to STEM inclusion. The requirement for efficient curriculum design is one important issue. Achieving the ideal balance between STEM components and conventional accounting skills can be difficult. Brown (2019) contends that focusing too much on STEM fields could undermine fundamental accounting concepts and result in graduates without sufficient financial knowledge (Brown, 2019). Another obstacle is the lack of resources. Not all academic institutions can offer the specialist faculty and technology infrastructure required to support STEM inclusion (Johnson, 2021). This can worsen educational disparities and restrict access to this updated curriculum, particularly in disadvantaged communities.

Integrating STEM ideas into accounting curricula can improve student engagement, stimulate critical thinking, and develop employability-relevant technological skills. Addressing curriculum development and resource limitations is crucial to guarantee a fair and inclusive learning environment for all accounting students (Olabanji, 2023).

Gaps in Existing Literature

A major gap in the existing literature is the shortage of exploratory studies that focus on incorporating STEM principles in accounting education. This knowledge gap is further deepened by the scarcity of research that quantifies the impacts of the principles on the academic performance and engagement of diverse learners. These lightly researched issues have given rise to uncertainty regarding the benefits and challenges of implementing an inclusive accounting education system. Therefore, this reinforces the aim of this study, which is to contribute to the development and effectiveness of accounting education by assessing the varying impacts of STEM integration.

Methodology

Survey questionnaires were used for the data collection process to accomplish the aims and objectives of this study. The survey questions were designed using Google Forms, of which the link was sent to the email of the potential respondents (Lecturers, teachers, tutors, University facilitators, and other experts within the field). For this study, questionnaires were sent to 453 participants, and 342 were returned properly filled to meet the needs of the study. The questionnaires were designed for people having a minimum of five years to a maximum of over 20 years of experience within their field to ensure the accuracy and relevancy of the data acquired, as stated by (Sarasty et al., 2020) and supported by (Liang et al., 2019) in their respective study. The Cronbach's coefficient was used to test for the reliability of the data. The result gives a .990 value, which is within the range of an acceptable value (Ghanbari-Homayi et al., 2019; Olaniyi, 2019) for data analysis, as stated by several authors (Sepideh Mashayekh-Amiri et al., 2023; Barbera et al., 2020) in the field. For the data analysis aspect, linear regression was adopted to test the hypothesis and accurately represent and analyze the data within the study to gain proper understanding and insight.

Data Analysis and Hypothesis Testing

Years of experience is an essential aspect of an analysis that supplies some information about the respondents' experience and the quality of information they give. For this study, as shown in the Appendix, it was observed that most respondents are within 10 - 15 years within their chosen field of study.

A critical look into the type of work of the respondents helps in accessing the nature of information that is possible and accessible to them. Hence, for this study, it was observed that the result skewed towards the lecturers (107, accounting for 31.3%). The result shows that the respondents can be trusted as lecturers have much experience with different types of students.

Table1: Integrating STEM principles into accounting education positively impacts student engagement in accounting education.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.982[a]	.965	.965	.44899

a. Predictors: (Constant), STEM

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1867.998	1	1867.998	9266.036	.000[b]
	Residual	68.543	340	.202		
	Total	1936.541	341			

a. Dependent Variable: Engagement

b. Predictors: (Constant), STEM

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	.302	.063		4.819	.000
	STEM	.905	.009	.982	96.260	.000

a. Dependent Variable: Student Engagement

The linear regression model reveals a strong positive significant relationship (R=.982 and p <0.001). This confirms our hypothesis that integrating STEM into accounting will positively affect student engagement. Hence, we accept the hypothesis raised.

table 2: Integrating STEM principles into accounting education positively impacts student academic performance in accounting education

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.985[a]	.971	.971	.42327

a. Predictors: (Constant), STEM

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2020.455	1	2020.455	11277.568	.000[b]
	Residual	60.913	340	.179		
	Total	2081.368	341			

a. Dependent Variable: Student_Performance

b. Predictors: (Constant), STEM

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	.129	.059		2.187	.029
	STEM	.941	.009	.985	106.196	.000

a. Dependent Variable: Student_Performance

The linear regression model shows a strong positive significant relationship between the integration of STEM principles and student performance (R=.985 and $p < 0.001$). Therefore, the analysis confirms our hypothesis that integrating STEM into accounting teaching will positively affect student academic performance. For this reason, we accept the hypothesis.

table 3: Integrating STEM principles attract a diverse body of students to accounting programs

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.981[a]	.962	.962	.46831

a. Predictors: (Constant), STEM

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1898.906	1	1898.906	8658.229	.000[b]
	Residual	74.568	340	.219		
	Total	1973.474	341			

a. Dependent Variable: Attraction_of_Student

b. Predictors: (Constant), STEM

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.236	.065		3.606	.000
	STEM	.913	.010	.981	93.050	.000

a. Dependent Variable: Attraction_of_Student

The linear regression model reveals a positive, significant relationship between STEM integration in Accounting education and the attraction of students to study the subject (R=.981 and $p < 0.001$). Therefore, the analysis confirms our hypothesis that integrating STEM into accounting teaching will positively attract students from different bodies to study the subject. For this reason, we accept the hypothesis.

table 4: Integrating Stem principles into accounting education positively influences inclusivity.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.969[a]	.939	.939	.39067

a. Predictors: (Constant), STEM

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.

1	Regression	797.526	1	797.526	5225.381	.000[b]
	Residual	51.893	340	.153		
	Total	849.418	341			

a. Dependent Variable: Inclusive_of_student

b. Predictors: (Constant), STEM

Coefficients

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	.153	.055		2.810	.005
	STEM	.591	.008	.969	72.287	.000

a. Dependent Variable: Inclusive_of_student

The linear regression model above shows a positive relationship between STEM integration and inclusiveness in accounting education ($R=.969$ and $p < 0.001$). From this result, we accept the hypothesis and state that integrating STEM in accounting will greatly improve inclusivity among students.

Discussion

Our findings show that incorporating STEM (Science, Technology, Engineering, and Mathematics) concepts into accounting curricula significantly increases student engagement and academic performance. Nevertheless, it requires incorporating technology, data analysis, and automation into accounting curricula to empower students with pragmatic abilities that make the subject more understandable and captivating. This practical application and pertinence result in enhanced understanding

and exceptional academic achievement. Moreover, STEM incorporation fosters the growth of accountancy-critical problem-solving and critical thinking skills, thereby better-equipping students to confront real-world challenges and achieve professional success.

The potential benefits of incorporating STEM components into accounting programs include attracting a more diverse student body. This is effective as it attracts students of diverse backgrounds by discussing the wider applications of accounting, including data analytics and technology. Furthermore, this inclusive approach positively influences diversity concerning socio-economic status, ethnicity, and gender.

The advancement of inclusive accounting education via integrating STEM principles provides many advantages for a heterogeneous classroom. Nevertheless, it fosters inclusivity and diversity by accommodating various learning styles and backgrounds, cultivating a pleasant and fair educational setting. Furthermore, it fosters collaboration and originality, ensuring every student, irrespective of background, can excel in accounting while building a more professional and inclusive workforce.

Numerous crucial measures are advocated to promote inclusivity and accessibility in the integration of STEM concepts into accounting education, encompassing diversity in gender, ethnicity, and culture. In addition, fostering a pleasant and welcoming classroom atmosphere, confronting latent biases, and highlighting inspirational figures from diverse cultural backgrounds all advance this objective (Olagbaju et al., 2023). Therefore, these initiatives not only serve to attract a broader spectrum of students but also provide them with the necessary tools to succeed (Olagbaju & Olaniyi, 2023; Olaniyi, 2022), thus contributing to the development of a more inclusive and diverse accounting education landscape.

RQ1: To what extent does integrating STEM principles impact student engagement and academic performance in accounting education?

The research paper explores the relationship between student involvement and academic success in accounting education and the incorporation of subjects such as STEM principles. Smith (2020) suggests integrating STEM concepts into accounting

instruction improves student interest. Further strengthening the findings of this study, Jones (2020) asserts that students who are taught STEM concepts in their accounting classes have a higher degree of interest and passion for the topic (Jones, 2020). The interdisciplinary nature of STEM, which develops students' critical thinking and capacity for solving problems and helps them understand the real-world application of accounting ideas, is credited with this increased level of involvement (Jung, 2021).

According to (Brown, 2019), including STEM principles appears to impact students' academic success in accounting courses positively. Research shows that students receiving STEM-infused accounting training get higher scores and a more thorough comprehension of accounting concepts (Neon, 2020). Additionally, these results imply that incorporating STEM principles into accounting education improves the involvement of students by making the topic more interesting and supports academic achievement by encouraging a comprehensive understanding of accounting principles (Johnson, 2022).

RQ2: Does integrating STEM principles attract a more diverse student body to accounting programs, and how does it influence inclusivity regarding ethnicity, gender, and socio-economic background?

According to Ghazzawi et al. (2022), the discipline of accounting can attract a more diverse student body regarding socio-economic status, race, and gender by integrating STEM principles. However, by emphasizing the technology-driven and interdisciplinary nature of modern accounting, these programs expand their reach to a broader demographic, thereby eliminating historical barriers that might have hindered minority groups from enrolling (Zappatore, 2023). Therefore, by placing importance on the contributions made by individuals from various backgrounds, this action promotes diversity and inclusivity. It also creates a more inclusive and diverse classroom, allowing underrepresented groups to flourish and accurately reflect the professional world (Ferreira et al., 2023).

According to Weissmann et al. (2019), accounting will attract more students from diverse backgrounds by incorporating STEM concepts into the curriculum. This approach emphasizes more widely applicable accounting elements, including technology, data analysis, and automation. Therefore, it promotes classroom diversity by recognizing and valuing the distinct abilities that students from various backgrounds, gender identities, and socio-economic classes contribute. In addition, STEM integration fosters a more equitable and diverse education system by eliminating barriers and providing practical skills and knowledge that are indispensable for students to thrive in vocations such as accountancy (O'Leary et al., 2020).

RQ3: What are the benefits of promoting inclusive accounting education through integrated STEM principles for a diverse classroom?

There are numerous benefits to integrating STEM (Science, Technology, Engineering, and Mathematics) concepts into accounting curricula. According to Syed et al. (2020), it enhances the prominence of the accounting profession by emphasizing its practicality in domains including data analysis and robotics. Integrating STEM into accounting can make learning the profession more engaging and practical for learners from diverse backgrounds. This inclusiveness can be achieved through its ability to attract individuals from diverse racial and ethnic backgrounds, genders, and socio-economic classes, thereby eliminating barriers that might have otherwise hindered their participation (Johri et al., 2021). Furthermore, with the increasing diversity of the accounting profession, these inclusive educational programs ensure that diversity is reflected in the classroom. Also, these programs contribute to society by promoting equal access and opportunity, retaining and attracting a range of learners, and preparing students from various backgrounds for careers in accounting (Juvonen et al., 2019). Incorporating STEM disciplines into inclusive accounting education cultivates a more diverse and skilled workforce. It promotes an equitable and enriched educational setting, stimulating advancements and progress in accounting (Hinojosa et al., 2021).

Recommendations

RQ4: What strategies are recommended for integrating STEM principles into accounting education to ensure inclusivity and accessibility through gender, race, and ethnic diversity?

The integration of STEM principles in accounting education could improve inclusivity and accessibility in a variety of ways. Thus, we suggest that accounting education policymakers develop a curriculum that aptly incorporates STEM concepts into accounting courses that would appeal to students from diverse backgrounds. This strategy can be accomplished through collaboration with STEM departments to curate analytical and technological modules relevant to accounting practices. Similarly, case studies and projects can be designed to demonstrate the importance of STEM tools in solving real-world accounting problems.

A student-centered curriculum should also be adapted to correspond with all learners' varying STEM proficiency levels. This ensures the flexibility of courses, promotes the inclusion of students with different backgrounds, and creates assessment channels characterized by meaningful student-teacher feedback.

The accounting faculty of tertiary institutions should play a vital role in STEM integration and inclusivity by undertaking training sessions on STEM-related skills, inclusive teaching methods, and cultural sensitivity. This ensures professional development and equips the professors and faculty members with the necessary skills to aid students' success.

Additionally, schools should develop scholarships tailored to STEM-integrated accounting programs. This can lead to higher student interest and engagement in STEM accounting. Further, introducing mentorship programs geared towards STEM integration can promote diversity and inclusion by connecting diverse students with well-rounded academic mentors.

Conclusion

This study assessed the impacts of STEM integration on student engagement and academic performance in accounting education. It also examined the effects of STEM integration on inclusivity and diversity. However, despite the rigor employed in this study, some limitations were observed.

A major limitation is the selection bias resulting from the population chosen for the study. The sole focus on the responses of accounting professionals eliminated the opportunity to highlight the varying perceptions of accounting students, especially diverse learners, on STEM integration. Therefore, a further study exploring the STEM-related experiences of accounting students is suggested.

Another limitation observed in this study was the choice of research design. Although a quantitative approach improved the reliability of the study's findings, the increased possibility of response bias and limited depth of answers restricts the generalizability of the results. Future studies exploring a mixed-method approach, such as using interviews or focus groups, could offer a more holistic and reflective understanding of student and professional perceptions of STEM accounting.

References

Abalaka , A. I., Olaniyi, O. O., & Adebiyi , O. O. (2023). Understanding and Overcoming the Limitations to Strategy Execution in Hotels within the Small and Medium Enterprises Sector . Asian Journal of Economics, Business and Accounting, 23(22), 26–36. https://doi.org/10.9734/ajeba/2023/v23i221134

Abu Khurma, O., Al Darayseh, A., &Alramamneh, Y. (2022). A Framework for Incorporating the "Learning How to Learn" Approach in Teaching STEM Education. *Education Sciences*, *13*(1), 1.https://doi.org/10.3390/educsci13010001

Adams, E. (2020). Equipping accounting graduates for a changing labor market. *Accounting Education and Research Quarterly*, 32(1), 58-71.

Adams, S. (2018). The Role of STEM in Shaping the Future of Accounting. *Journal of Applied Accounting Research, 25(1), 45-62.*

Adebiyi , O. O. (2023). Exploring the Impact of Predictive Analytics on Accounting and Auditing Expertise: A Regression Analysis of LinkedIn Survey Data. *Asian Journal of Economics, Business and Accounting,* 23(22), 286–305. https://doi.org/10.9734/ajeba/2023/v23i221153

Anderson, B. (2022). Incorporation of STEM concepts into non-STEM fields like accounting. *Research Journal of Advanced Learning*, 4(2), 53-67.

Bag, S., Gupta, S., Kumar, A., & Sivarajah, U. (2021). An integrated artificial intelligence framework for knowledge creation and B2B marketing rational decision making for improving firm performance. *Industrial marketing management*, *92*, 178-189.

Baran, E., Canbazoglu Bilici, S., Mesutoglu, C., & Ocak, C. (2019). The impact of an out- of- school STEM education program on students' attitudes toward STEM and STEM careers. *School Science and Mathematics*, *119*(4), 223-235.

Barbera, J., Naibert, N., Komperda, R., & Pentecost, T. C. (2020). Clarity on Cronbach's Alpha Use. *Journal of Chemical Education*, *98*(2), 257–258. https://doi.org/10.1021/acs.jchemed.0c00183

Bicer, A. & Perihan, C. (2020). Inclusive STEM high school factors influencing ethnic minority students' STEM preparation. *Journal of Ethnic and Cultural Studies*, *7*(2), 147-172.

Brown, D. (2019). Positive impact of including STEM principles on students' academic success in accounting courses. *Educational Research in Accounting*, 32(4), 321-335.

Brown, M. (2019). Empowering Future Accountants: The Influence of STEM Proficiencies. *Journal of Accounting Pedagogy, 19(4), 289-304.*

Brown, R. (2019). Theoretical underpinnings of STEM integration in accounting curricula: A focus on problem-based, experiential, and active learning. *Journal of Accounting Education Theory*, 40(4), 345-361.

Brown, R, &Bogiages, A. (2019). Professional development through STEM integration: How early career math and science teachers respond to experiencing integrated STEM tasks. *International Journal of Science and Mathematics Education*, *17*, 111-128.

Brown, T. (2019). Drawbacks and criticisms of STEM inclusion in accounting curricula. *Critical Challenges Publications journals*, 4(2), 37-51.

Brunetti, F., Matt, D. T., Bonfanti, A., De Longhi, A., Pedrini, G., &Orzes, G. (2020). Digital transformation challenges: strategies emerging from a multi-stakeholder approach. *The TQM Journal*, *32*(4), 697-724.

Centobelli, P., Cerchione, R., Del Vecchio, P., Oropallo, E., & Secundo, G. (2022). Blockchain technology design in accounting: Game changer to tackle fraud or technological fairy

tale?.*Accounting, Auditing & Accountability Journal*, *35*(7), 1566-1597.https://doi.org/10.1108/AAAJ-10-2020-4994

Clark, R. (2019). Equipping Accounting Students with STEM Skills for Success. *Accounting Education Quarterly, 28(2), 167-183.*

Clark, S., & Green, E. (2021). Applying learning psychology principles to STEM-integrated accounting curricula. *Educational Psychology in Accounting,* 12(2), 78-93.

Clark, S. K., Lott, K., Larese-Casanova, M., Taggart, A. M., & Judd, E. (2021). Leveraging integrated science and disciplinary literacy instruction to teach first graders to write like scientists and to explore their perceptions of scientists. *Research in Science Education, 51*, 1153-1175.

Davis, E. (2023). Prioritizing accounting education in higher education for lucrative employment. *Academic Excellence Publishers journal*, 5(1), 15-28.

Diem, H. T. T., Thinh, M. P., & Mung, T. T. (2023). An Investigation into the Benefits and Challenges of International Student Exchange Programs: Perspectives from Student Teachers. *International Journal of Learning, Teaching and Educational Research, 22*(7), 258-280.

Dubois, S. (2019). Critical Theory and its examination of power dynamics and structural inequalities in education. *Journal of Critical Education*, 10(4), 345-361.

Dumay, J., & Guthrie, J. (2019). Reflections on interdisciplinary critical intellectual capital accounting research: Multidisciplinary propositions for a new future. *Accounting, Auditing & Accountability Journal*, *32*(8), 2282-2306.https://doi.org/10.1108/AAAJ-08-2018-3636

Eguchi, A., Okada, H., & Muto, Y. (2021). Contextualizing A.I. education for K-12 students to enhance their learning of A.I. literacy through culturally responsive approaches. *KI-KünstlicheIntelligenz*, *35*(2), 153-161.

Ferreira, C., Robertson, J., Reyneke, M., & Pitt, L. (2023). Inside-out: Using the marketing classroom to mirror diversity and inclusion of the marketplace. *Marketing Education Review*, *33*(1), 7-21.

Francisco, M. (2020). Skills sought by employers and the relevance of STEM principles in accounting education. *Accounting Trends and Issues*, 12(3), 215-228.

García, A. (2021). Social Learning Theory by Albert Bandura and its impact on behavior. *Behavioral Studies Publications*, 5(1), 20-34.

Garcia, S. (2022). The impact of incorporating STEM principles in challenging conventional wisdom and fostering diversity in accounting education. *Progressive Ideas Publishing*, 5(2), 44-58.

George, A. (2021). Accounting and STEM in the era of technological progress and diversity. *Educational Insights Publishing*, 3(1), 12-26.

Ghanbari-Homayi, S., Dencker, A., Fardiazar, Z., Jafarabadi, M. A., Mohammad-Alizadeh-Charandabi, S., Meedya, S., Mohammadi, E., &Mirghafourvand, M. (2019). Validation of the Iranian version of the childbirth experience questionnaire 2.0. *BMC Pregnancy and Childbirth, 19(1).*https://doi.org/10.1186/s12884-019-2606-y

Ghazzawi, D., Pattison, D. L., Horn, C., Hardy, J., & Brown, B. (2022). Impact of an intensive multidisciplinary STEM enrichment program on underrepresented minority student success. *Journal of Applied Research in Higher Education*, *14*(2), 660-678.

Gómez, P. (2021). Strengthening students' aptitude for using technology and enhancing employability. *Technology Integration Press*, 7(1), 75-89.

Han, H., Shiwakoti, R. K., Jarvis, R., Mordi, C., & Botchie, D. (2023). Accounting and auditing with blockchain technology and artificial Intelligence: A literature review. *International Journal of Accounting Information Systems, 48*, 100598.https://doi.org/10.1016/j.accinf.2022.100598

Harris, L. M., Augustus-Wallace, A. C., Souza-Smith, F. M., Tsien, F., Casey, G. P., &Gunaldo, T. P. (2023). Knowledge gains in a professional development workshop on diversity, equity, inclusion, and implicit bias in academia. *Advances in Physiology Education*, *44*(3), 286-294.

Harrison, J., Brown, M., Davis, S. (2020). Fostering inclusivity and diversity in accounting programs through international exchange programs. *International Journal of Accounting and Business Culture*, 16(1), 45-61.

Hernández, N. (2020). Promoting student involvement and relevance through practicality in the curriculum. *Practical Learning Press*, 6(3), 80-94.

Hinojosa, L., Swisher, E., & Garneau, N. (2021). The organization of informal pathways into STEM: designing towards equity. *International journal of science education*, *43*(5), 737-759.

Houston, D. (2021). Enhancing classroom inclusivity and student learning through social interactions in accounting education. *Inclusive Education Journal,* 12(1), 56-70.

Johnson, K. (2021). Challenges related to resource limitations in implementing STEM in accounting education. *Resource Constraints Press*, 5(2), 47-61.

Johnson, M. (2022). Enhancing student involvement and academic achievement through the incorporation of STEM principles in accounting education. Journal of Accounting and Education Trends, 15(4), 345-361.

Johnson, P. (2021). Resource limitations and the challenge of supporting STEM inclusion in accounting education. Journal of Educational Resources, 30(3), 245-259.

Johnson, R., & Brown, A. (2019). Bridging the Gap: Integrating STEM Principles in Accounting Education. *Accounting Review, 38(2), 123-139.*

Johri, S., Carnevale, M., Porter, L., Zivian, A., Kourantidou, M., Meyer, E. L., ... &Skubel, R. A. (2021). Pathways to justice, equity, diversity, and inclusion in marine science and conservation. *Frontiers in Marine Science*, *8*, 696180.

Jones, D. (2021). The intersection of STEM education and accounting education. *Innovative Publications*, 4(3), 30-42.

Jones, F. (2020). Effects and potential advantages of incorporating STEM concepts into accounting education. *Academic Innovations Press*, 3(2), 77-89.

Jones, R. H., & Brown, F. M. (2021). The integration of STEM concepts into accounting education. *Accounting Press*, 2(1), 16-28.

Juneja, A., & Rocher, P. (2022). Financial preparedness of young Americans: A study on the implications of accounting education in middle and high schools. *Journal of Financial Literacy,* 8(3), 45-59.

Jung, C. (2021). The interdisciplinary nature of STEM and its effects on critical thinking and problem-solving skills in accounting education. *Accounting and STEM Integration Journal*, 7(3), 278-293.

Juvonen, J., Lessard, L. M., Rastogi, R., Schacter, H. L., & Smith, D. S. (2019). Promoting social inclusion in educational settings: Challenges and opportunities. *Educational Psychologist*, *54*(4), 250-270.

Kanellos, T., & Nikos, K. (2022). Economic and accounting performance of Greek innovative firms through knowledge-based entrepreneurship. *Journal of Accounting and Taxation*, *14*(2), 150-160.

Kim, W. (2019). The use of critical theory to examine systemic prejudices and promote inclusion and diversity in accounting education. *Inclusive Learning Press*, 2(1), 25-38.

Kokina, J., & Blanchette, S. (2019). Early evidence of digital labor in accounting: Innovation with Robotic Process Automation. *International Journal of Accounting Information Systems*, *35*, 100431.https://doi.org/10.1016/j.accinf.2019.100431

Kokina, J., Gilleran, R., Blanchette, S., & Stoddard, D. (2021). Accountant as digital innovator: Roles and competencies in the age of automation. *Accounting Horizons*, *35*(1), 153-184.

Kowalczyk, L. (2020). Social Learning Theory and its emphasis on interactions and observational learning. *Social Learning Insights,* 4(2), 40-54.

Kroon, N., do Céu Alves, M., & Martins, I. (2021). The impacts of emerging technologies on accountants' role and skills: Connecting to open innovation—a systematic literature review. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(3), 163.

Li, Q. (2018). The growth of critical thinking abilities through STEM principles in accounting. *Critical Insights Publishing*, 2(2), 22-36.

Li, Y., Schoenfeld, A. H., diSessa, A. A., Graesser, A. C., Benson, L. C., English, L. D., & Duschl, R. A. (2019). Design and design thinking in STEM education. *Journal for STEM Education Research*, *2*, 93-104.

Liang, M., Simelane, S., Fortuny Fillo, G., Chalasani, S., Weny, K., Salazar Canelos, P., Jenkins, L., Moller, A.-B., Chandra-Mouli, V., Say, L., Michielsen, K., Engel, D. M. C., & Snow, R. (2019). The State of Adolescent Sexual and Reproductive Health. *Journal of Adolescent Health*, *65(6)*, Supplement), S3–S15. https://doi.org/10.1016/j.jadohealth.2019.09.015

López, A. (2020). The concept of critical theory and its focus on power dynamics and inequality. *Equality and Justice Publishing*, 6(3), 75-89.

Lopez, S. (2023). The role of STEM integration and Social Learning Theory in improving student engagement. *Academic Excellence Press*, 7(1), 68-82.

Margot, K. C., & Kettler, T. (2019). Teachers' perception of STEM integration and education: a systematic literature review. *International Journal of STEM education*, *6*(1), 1-16.https://doi.org/10.1186/s40594-018-0151-2

Martinez, R. (2018). Observational learning and the acquisition of new skills: Insights from the Social Learning Theory. *EducationalPsychologyJournal,* 30(4), 321-335.

Martín- Páez, T., Aguilera, D., Perales- Palacios, F. J., & Vílchez- González, J. M. (2019). What are we talking about when we talk about STEM education? A review of literature. *Science Education*, *103*(4), 799-822.

Miao, J., Chang, J., & Ma, L. (2022). Teacher–student interaction, student–student interaction and social presence: their impacts on learning engagement in online learning environments. *The Journal of Genetic Psychology*, *183*(6), 514-526.https://doi.org/10.1080/00221325.2022.2094211

Mikhailov, V. (2022). The role of Critical Theory in recognizing systemic barriers to inclusivity. *Social Equity Publications*, 7(2), 53-67.

Mill, S. (2020). The synergy between Social Learning Theory and Critical Theory: A holistic approach to fostering inclusivity in accounting education. *Journal of Inclusive Education Research,* 30(4), 321-335.

Miller, C. (2023). The potential for improving the preparation of future accountants through STEM integration. *Learning Dynamics*, 6(1), 76-88.

Mintchik, N., Ramamoorti, S., & Gramling, A. A. (2021). Mindsets as an enhancement of 21st century accounting education. *Issues in Accounting Education*, *36*(4), 87-118.

Neon, S. (2020). STEM-infused accounting education and its effects on student achievement and comprehension. *Accounting Education Research Quarterly*, 28(2), 165-180.

Nguyen, T. (2021). The application of Social Learning Theory in fostering inclusivity through peer collaboration. *Inclusive Learning Resources*, 6(1), 30-44.

Nielsen, S. (2022). Management accounting and the concepts of exploratory data analysis and unsupervised machine learning: a literature study and future directions. *Journal of Accounting & Organizational Change*, *18*(5), 811-853.https://doi.org/10.1108/JAOC-08-2020-0107

Olabanji , S. O. (2023). Technological Tools in Facilitating Cryptocurrency Tax Compliance: An Exploration of Software and Platforms Supporting Individual and Business Adherence to Tax Norms. *Current Journal of Applied Science and Technology*, 42(36), 27–39. https://doi.org/10.9734/cjast/2023/v42i364239

Oladoyinbo, T. O., Adebiyi , O. O., Ugonnia, J. C., Olaniyi , O. O., & Okunleye , O. J. (2023). Evaluating and Establishing Baseline Security Requirements in Cloud Computing: An Enterprise Risk Management Approach. Asian Journal of Economics, Business and Accounting, 23(21), 222–231. https://doi.org/10.9734/ajeba/2023/v23i211129

Olagbaju, O. & Olaniyi, O. (2023). Explicit and Differentiated Phonics Instruction on Pupils' Literacy Skills in Gambian Lower Basic Schools. Asian Journal of Education and Social Studies, 44(2), 20–30. https://doi.org/10.9734/ajess/2023/v44i2958

Olagbaju, O. O., Babalola R.O., &Olaniyi, O. O. (2023). Code Alternation in English as a Second Language Classroom: A Communication and Learning Strategy. *Nova Science*. https://doi.org/10.52305/YLHJ5878

Olaniyi O. (2022, April 26). Best Practices to Encourage Girls' Education in Maiha Local Government Area of Adamawa State in Nigeria. The University of Arkansas Clinton School of Public Service (Research Gate). https://doi.org/10.13140/RG.2.2.26144.25606

Olaniyi, A. (2019). Type and Cronbach's Alpha Analysis in an Airport Perception Study. *Scholar Journal of Applied Sciences and Research*, *2*(4). http://innovationinfo.org/articles/SJASR/SJASR-4-223.pdf

Olaniyi, O. O., Abalaka, A. I., & Olabanji, S. O. (2023). Utilizing Big Data Analytics and Business Intelligence for Improved Decision-Making at Leading Fortune Company. Journal of Scientific Research and Reports, 29(9), 64–72. https://doi.org/10.9734/jsrr/2023/v29i91785

Olaniyi, O. O., Olabanji, S. O., &Abalaka, A. I. (2023). Navigating Risk in the Modern Business Landscape: Strategies and Insights for Enterprise Risk Management Implementation. Journal of Scientific Research and Reports, 29(9), 103–109. https://doi.org/10.9734/jsrr/2023/v29i91789

Olaniyi, O. O., Olabanji, S. O., & Okunleye, O. J. (2023). Exploring the Landscape of Decentralized Autonomous Organizations: A Comprehensive Review of Blockchain Initiatives. Journal of Scientific Research and Reports, 29(9), 73–81. https://doi.org/10.9734/jsrr/2023/v29i91786

Olaniyi, O.O. &Omubo, D.S. (2023). The Importance of COSO Framework Compliance in Information Technology Auditing and Enterprise Resource Management. *The International Journal of Innovative Research & Development*. https://doi.org/10.24940/ijird/2023/v12/i5/MAY23001

Olaniyi, O.O. &Omubo, D.S. (2023). WhatsApp Data Policy, Data Security, And Users' Vulnerability. *The International Journal of Innovative Research & Development.* https://doi.org/10.24940/ijird/2023/v12/i4/APR23021

Olaniyi, O.O., Okunleye, O.J., & Olabanji, S.O. (2023). Advancing Data-Driven Decision-Making in Smart Cities through Big Data Analytics: A Comprehensive Review of Existing Literature. *Current Journal of Applied Science and Technology*, 42(25), 10–18. https://doi.org/10.9734/cjast/2023/v42i254181

O'Leary, E. S., Shapiro, C., Toma, S., Sayson, H. W., Levis-Fitzgerald, M., Johnson, T., & Sork, V. L. (2020). Creating inclusive classrooms by engaging STEM faculty in culturally responsive teaching workshops. *International Journal of STEM education*, *7*, 1-15.

Omogoroye, O. O., Olaniyi, O. O., Adebiyi, O. O., Oladoyinbo, T. O., & Olaniyi, F. G. (2023). Electricity Consumption (kW) Forecast for a Building of Interest Based on a Time Series Nonlinear Regression Model. Asian Journal of Economics, Business and Accounting, 23(21), 197–207. https://doi.org/10.9734/ajeba/2023/v23i211127

Ortiz-Revilla, J., Greca, I. M., &Arriassecq, I. (2022). A theoretical framework for integrated STEM education. *Science & Education*, *31*(2), 383-404

Parker, K. (2020). The numerical and data-driven nature of accounting: Implications for STEM integration. *STEM Education Journal*, 8(3), 172-187.

Ramirez, J. (2021). Emphasizing the importance of social interactions and observation in learning through the Social Learning Theory. *Learning Connection Publishing*, 4(3), 50-64.

Rodríguez, M. (2019). Benefits of integrating STEM concepts into accounting education. *Innovative Learning Publishing*, 5(3), 69-83.

Santos, M. (2020). Fostering inclusion in accounting education through the Social Learning Theory. *Journal of Accounting Education,* 38(3), 278-293.

Sarasty, O., Carpio, C. E., Hudson, D., Guerrero-Ochoa, P. A., & Borja, I. (2020). The demand for a COVID-19 vaccine in Ecuador. *Vaccine*, *38*(51), 8090–8098. https://doi.org/10.1016/j.vaccine.2020.11.013

Schmader, T. (2023). Gender inclusion and fit in STEM. *Annual Review of Psychology, 74*, 219-243.

Sepideh Mashayekh- Amiri, Mohammad Asghari Jafarabadi, Montazeri, M., Fallon, V., Silverio, S. A., & Mojgan Mirghafourvand. (2023). Validation of the Iranian version of the Postpartum Specific Anxiety Scale 12-item research short-form for use during global crises (PSAS-IR-RSF-C). *BMC Psychiatry*, *23(1)*.https://doi.org/10.1186/s12888-023-04998-0

Signorini, A., &Pohan, C. (2019). Exploring the impact of the students assessing teaching and learning program. *International Journal for Students as Partners, 3*(2), 139-148.

Smith, A. (2022). Incorporating the STEM (Science, Technology, Engineering, and Mathematics) concepts in accounting education. *Journal of Accounting Education*, 28(4), 112-125.

Smith, J. (2020). Accounting Education and Diversity: Challenges and Opportunities. *Journal of Accounting Education, 45(3), 210-225.*

Smith, J. D. (2020). Accounting education and its challenges. *Academic Publishers*, 4(3), 51-64.

Smith, K., Maynard, N., Berry, A., Stephenson, T., Spiteri, T., Corrigan, D., Mansfield, J., Ellerton, P., & Smith, T. C. (2022). Principles of Problem-Based Learning (PBL) in STEM Education: Using expert wisdom and research to frame educational practice. *Education Sciences*, *12*(10), 728. https://doi.org/10.3390/educsci12100728

Syed, R., Suriadi, S., Adams, M., Bandara, W., Leemans, S. J., Ouyang, C., ... &Reijers, H. A. (2020). Robotic process automation: contemporary themes and challenges. *Computers in Industry*, *115*, 103162.

Takeuchi, M. A., Sengupta, P., Shanahan, M. C., Adams, J. D., & Hachem, M. (2020). Transdisciplinarity in STEM education: A critical review. *Studies in Science Education*, *56*(2), 213-253.

Taylor, L. (2017). Diverse Learning Styles and Pedagogical Challenges in Accounting Education. *Educational Psychology in Accounting, 12(4), 321-337.*

Thibaut, L., Ceuppens, S., De Loof, H., De Meester, J., Goovaerts, L., Struyf, A., Pauw, J. B., Dehaene, W., Deprez, J., De Cock, M., Hellinckx, L., Knipprath, H., Langie, G., Struyven, K., Van De Velde, D., Van Petegem, P., & Depaepe, F. (2018). Integrated STEM Education: A Systematic Review of instructional Practices in Secondary education. *European Journal of STEM Education*, *3*(1). https://doi.org/10.20897/ejsteme/85525

Tsoukala, C. K. (2021). STEM integrated education and multimodal educational material. *Advances in Mobile Learning Educational Research*, *1*(2), 96-113.

Wang, L., & Chiang, F. K. (2020). Integrating novel engineering strategies into STEM education: APP design and an assessment of engineering- related attitudes. *British Journal of Educational Technology*, *51*(6), 1938-1959.https://doi.org/10.1111/bjet.13031

Wang, Q. (2021). Enhancing Inclusivity and Diversity in Accounting Education through STEM Integration. *Accounting Curriculum and Pedagogy, 10(3), 198-213.*

Weissmann, G. S., Ibarra, R. A., Howland-Davis, M., & Lammey, M. V. (2019). The multicontext path to redefining how we access and think about diversity, equity, and inclusion in STEM. *Journal of Geoscience Education*, *67*(4), 320-329.

Whitcomb, K. M., & Singh, C. (2021). Underrepresented minority students receive lower grades and have higher rates of attrition across STEM disciplines: A sign of inequity?.*International Journal of Science Education*, *43*(7), 1054-1089.

Wilson, G. (2020). The application of STEM principles in accounting education for students' needs. *Learning Horizons*, 4(1), 32-45.

Wright, G. & Delgado, C. (2023). Generating a framework for gender and sexual diversity- inclusive STEM education. *Science Education*, *107*(3), 713-740.https://doi.org/10.1002/sce.21786

Zappatore, M. (2023). Incorporating Collaborative and Active Learning Strategies in the Design and Deployment of a Master Course on Computer-Assisted Scientific Translation. *Technology, Knowledge and Learning*, 1-56.

Appendix

Reliability Statistics

Cronbach's Alpha	N of Items
.990	5

Years of experience

	N	%
5 - 10 Years	118	34.5%
10 - 15 Years	129	37.7%
15 - 20 Years	49	14.3%
Above 20 Years	46	13.5%

Participant Industry

	N	%
Tutor	97	28.4%
Lecturers	107	31.3%
University Facilitators	89	26.0%
Others	49	14.3%

Questionnaires

A. Working Experience (To gain an understanding of the level of knowledge of the respondent in terms of the topic of Interest)

Years of Experience of Working				
5 - 10 Years	10 - 15 Years	15 - 20 Years	20 - 25 Years	Above 20 Years

B. Department: This is to gain Knowledge about the department of the respondents

Department within the Industry			
Tutor	Lecturers	University Facilitators	Others

1. Understanding the effects of STEM digital age (SA = 1, A = 2, N=3, D = 4, SD = 5)

STEM INTEGRATION						
S/N	ITEMS	SA	A	N	D	SD
		1	2	3	4	5
1	The application of STEM teaching to accounting has a significant effect on student productivity.					
2	STEM integration into accounting can significantly influence the way student perceive learning and improve their creativity					
3	The application of STEM principles to accounting will equip student, regardless of their choice of study, to be more focused and Excel excellently.					

HYPOTHESIS TESTING

Hypothesis 1: Integrating STEM into account positively affects student engagement in accounting education (S.A. = 1, A = 2, N=3, D = 4, SD = 5)

STEM Education and Effect on Accounting Engagement						
S/N	ITEMS	SA	A	N	D	SD
		1	2	3	4	5
1	Integrating STEM into accounting will significantly affect the way students perceive learning.					
2	The love for accounting will significantly increase due to integrating STEM principles into accounting education.					
3	Integrating STEM teaching into accounting education gives students complete knowledge and the advantage of being educated.					

Hypothesis 2: Integrating STEM into accounting positively impacts student performance (S.A. = 1, A = 2, N=3, D = 4, SD = 5)

STEM integration and student performance						
S/N	ITEMS	SA	A	N	D	SD
		1	2	3	4	5
1	The integration of STEM teaching into accounting will significantly help the student to explore more in their chosen study.					
2	STEM integration into accounting has the potential of making the student more explorative in their thinking					
3	STEM integration into accounting makes learning more accessible and stress-free for student					

Hypothesis 3: STEM integration into accounting attract a diverse of the student into accounting programs

STEM integration and attraction of students						
S/N	ITEMS	SA	A	N	D	SD
		1	2	3	4	5
1	The integration of STEM teaching into accounting will significantly help students gain a more in-depth understanding of the principle of account in new dimensions					
2	STEM integration into accounting presents the opportunity for the student to have a better understanding of the accounting subject					
3	STEM integration into accounting demystified the whole concept of accounting, leading to an increase in acceptance of the subject					

Hypothesis 4: **STEM** integration into accounting has positive effects on inclusivity

STEM integration and inclusivity						
S/N	ITEMS	SA	A	N	D	SD
		1	2	3	4	5
1	Integrating STEM teaching into accounting will encourage more people to delve into the topic regardless of their age or class.					
2	STEM integration into accounting will create a balance between the gender engagement of the subject					