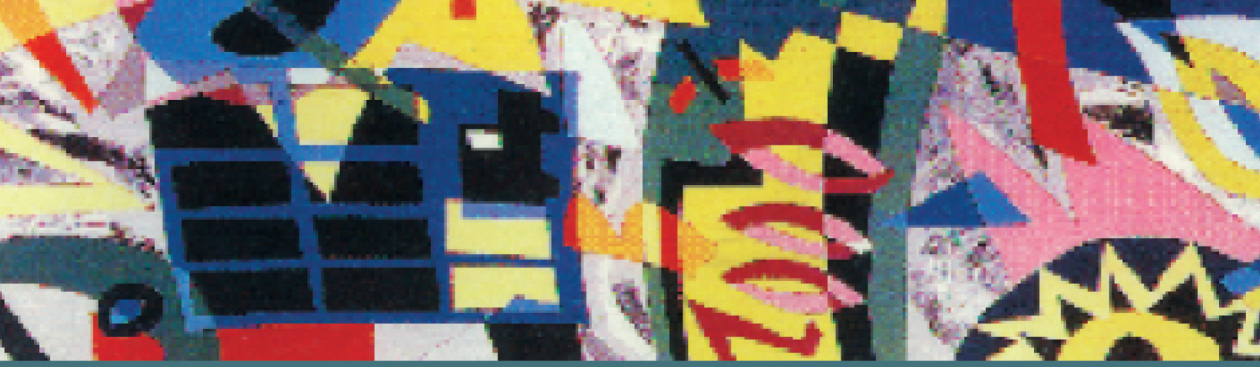

BUSINESS ADMINISTRATION AND ACCOUNTING STUDIES

EDOARDO CROCCO

REDEFINING ACCOUNTING EDUCATION

Integrating Technology, Gamification and Modern Curricula

IUSTITIAM COLIMUS

G. Giappichelli Editore

26

Procedura per l'approvazione dei volumi in Collana e referaggio.

La pubblicazione di una monografia nella Collana è subordinata al verificarsi di due circostanze:

a) accettazione della proposta editoriale presentata dall'autore/i secondo il formato definitivo dalla collana;
b) ottenimento di un giudizio positivo sul volume da parte di due revisori anonimi.

La proposta editoriale segue questo iter:

– la proposta viene inviata all'Editor in Chief attraverso la casella di posta elettronica csr.ba.management@unito.it (con richiesta di ricevuta) nel format previsto per la collana dall'Editore;
– valutazione da parte dell'Editor della proposta/manoscritto il quale decide del rigetto o dell'invio al referaggio; nel processo di valutazione si può avvalere del supporto del Comitato Scientifico;
– le proposte che ottengono un giudizio positivo sono senz'altro accettate;
– le proposte che ottengono un giudizio non pienamente positivo sono rivalutate dall'Editor avvalendosi del Comitato Scientifico per formulare il giudizio definitivo.

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Il referaggio è condotto da due revisori (referee). Questi possono essere scelti nell'ambito del Comitato Scientifico, ma anche al di fuori di esso, fra accademici che possiedano competenze adeguate sui temi trattati nella monografia inseriti nell'elenco dei referee.
I revisori sono scelti dall'Editor. I revisori non devono conoscere il nome dell'autore del volume oggetto di valutazione. L'Editor contatta i revisori individuati e invia loro, attraverso la casa editrice, il volume debitamente reso anonimo.
I revisori formulano il loro giudizio entro due mesi dal ricevimento del volume. Il giudizio è articolato secondo i punti contenuti in una scheda di referaggio appositamente redatta.
Il giudizio viene inviato all'Editor. Se, per entrambi i revisori, il giudizio è positivo e senza suggerimenti di revisione, il volume viene passato direttamente alla stampa. Se uno o entrambi i revisori propongono correzioni, l'Editor, inoltra i suggerimenti all'autore perché riveda il suo lavoro. Il lavoro corretto viene nuovamente inviato all'Editor che lo sottopone a una seconda revisione da svolgersi entro il termine massimo di un mese. In caso di giudizi contrastanti, l'Editor decide se acquisire un terzo parere, stampare comunque il volume o rifiutarlo.

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1.
Introduction to Accounting Education and Research Design

1.1. The Purpose of the Book

As the accounting profession undergoes a significant transformation driven by technological innovation and sustainability, accounting education must follow along said trends, to ensure graduates are able to effectively master the profession. In a world that is increasingly interconnected yet constantly evolving, and in a competitive landscape where stakeholders are more demanding and aware, accounting education faces the challenging task of producing the accountants of tomorrow, ensuring they have the skills required to address modern challenges. These challenges are varied and take different forms. For instance, as companies around the world face growing scrutiny from stakeholders regarding their environmental, social, and governance (ESG) performance, accounting curricula must be profoundly rethought to integrate these topics (Botes et al., 2023; Simmons et al., 2024; Tettamanzi et al., 2023). Accountability and ESG reporting are often viewed as the next major challenges for companies worldwide, requiring significant efforts to update the skill sets of accounting professionals to meet the evolving needs of both companies and stakeholders (Vanini & Bochert, 2024).

Similarly, technology represents a new frontier for accounting education. This frontier is multifaceted. On one hand, accountants will frequently interact with and use complex technologies, including big data and artificial intelligence (AI), to perform their daily tasks (Fogarty & Campbell et al., 2021; Theuri et al., 2024). Like ESG accounting, academic curricula need updating to reflect the changing landscape of the modern accounting workplace and the proficiency in technology expected from accountants today (Al-Hattami, 2024; Handoyo, 2024; O'Hara et al., 2024). On the other hand, technology can be a valuable tool for accounting education itself. The COVID-19 pandemic

taught many lessons, and most institutions are now comfortable with the extensive use of technological options such as distance learning and asynchronous online teaching materials, which serve as practical alternatives to traditional, face-to-face (F2F) delivery of accounting courses (Elsayed et al., 2023). However, given that accounting is a practical, number-oriented discipline, distance learning creates unique challenges for educators (Elsayed, 2022; Maldonado et al., 2023).

Thus, the future of accounting education is characterized by exciting new opportunities, conflicting dilemmas, disruptive potential, and challenging barriers to overcome. With this book, I aim to provide a critical, state-of-the-art review of accounting education and the various trajectories that will shape research and practice in the future. The book is designed to offer critical insights and suggestions on where accounting education currently stands in its evolution and where its path will lead in the coming years.

A bibliometric approach, paired with both qualitative and quantitative empirical case studies, will be adopted to provide robust findings and address some of the key research gaps emerging from the review of the stream. Additionally, the Latent Dirichlet Allocation (LDA) algorithm will be employed to classify and analyze the text corpus, formed by abstracts and titles of scientific articles extracted from a prominent academic database, namely Scopus. LDA allows for the processing of large bodies of textual information using a generative probabilistic model for topic identification. In other words, LDA acts as an unsupervised machine-learning technique that can derive topics from a corpus of text based on the occurrence of specific words in the database (Li et al., 2025; Liu et al., 2025).

The book will be structured as follows:

Chapter 1 will focus on the methodological implications of the study and its research design. I will provide an in-depth overview of the research protocol and methodology applied in the bibliometric review. I will explain why an integrated approach, combining both quantitative bibliometric research and qualitative insights from accounting educators, is the best fit for this book. The research design aims to provide a critical analysis of the current state-of-the-art in accounting education while offering a comprehensive overview of the future trajectories for educators and scholars. Several papers from the business and accounting fields support this choice, which was sparked by my attendance at the 2023 European Accounting Association conference, where I had the opportunity to discuss the topics of this book with Professors Greg Stoner and Nicola Beatson. The chapter will also present the tools used for the bibliometric analysis, namely R Studio, LDAShiny, and Bibliometrix, along with the protocols for sampling manuscripts from available scientific repositories.

Chapter 2 will examine how rapid technological advancements have impacted accounting education, as they have in other fields. Although various experiments with implementing technology in accounting education have been conducted over the past couple of decades, interest from both scientific and institutional circles sharply increased during the COVID-19 emergency. In the post-pandemic landscape, the use of technology in accounting education is now inescapable, offering several advantages for both educators and students. For example, blended learning, online platforms for downloading teaching materials, and virtual classrooms that allow students to attend lectures remotely. However, with these new opportunities come several challenges and barriers to adoption, particularly in accounting, where the technical nature of the subject makes asynchronous online learning more difficult. During physical classes, students can receive constant and tailored feedback from teachers, which is harder to achieve remotely or through blended learning. Thus, the chapter will critically evaluate studies exploring the effects of technology adoption in accounting education. The extensive bibliometric analysis will be complemented by on-field interviews with accounting educators from 2020 to 2024. The chapter will cover the benefits, barriers, and drawbacks of technology adoption in accounting education, concluding with an empirical case study on the use of blended learning in the post-pandemic era.

Chapter 3 will follow up on the discussion of technology's impact on accounting education by focusing on its use for gamification. Educators have experimented with incorporating game design techniques into accounting courses to boost engagement and enjoyment. The results have shown not only increased engagement from students, but also improved problem-solving and soft skills required in the modern workplace. Although gamification has been widely studied in various fields, its application to accounting education is especially interesting because of the practical nature of business subjects. While scholars generally agree that gamification increases engagement and understanding in accounting courses, the results are not universally applicable, and much of the research is exploratory and contradictory. This chapter will provide a critical review of the application of game-based learning in accounting education and its limitations. Additionally, it will include an empirical study using structural equation modeling to examine students' perspectives on game-based mobile learning applications. The study aims to shed light on the factors influencing the adoption and continued use of these tools, filling an important gap in the literature.

Chapter 4 will address another key area that emerged from the bibliometric sample: the need for academia to update accounting curricula in response to rapid changes in the professional world. New technologies and the growing

need for sustainability and ESG reporting are reshaping the accounting profession. This chapter will present scientific findings and highlight the gap between current accounting education and employer expectations. An empirical case study will explore the perspectives of practitioners and educators on the need for accounting education to evolve and modernize in response to these changes.

Finally, the concluding chapter will summarize the key points discussed and propose a structured research agenda to advance accounting education. Based on a critical analysis of the evidence from the bibliometric sample, I will identify critical gaps in the field. Several areas of accounting education research remain underdeveloped, particularly regarding the impact of digital technologies on course delivery, gamification in accounting education, and the need for curricula updates to match the evolving demands of the professional marketplace.

This book aims to be a comprehensive reference for both present and future research in accounting education, providing scholars with a thorough understanding of its current state and past trends, as well as serving as a resource for future research efforts. The innovative bibliometric analysis sets this book apart from previous reviews, and by combining qualitative case studies and quantitative field analysis, I aim to provide unique insights that will enrich the field of accounting education.

1.2. Research Design Overview

While accounting education is a promising stream of research due to several factors—namely, the relevance of accounting as a profession, the intricacies of its teaching delivery, and the frequent need to keep curricula aligned with the current professional landscape—the scientific output in this area is currently fragmented and marked by significant research gaps and unexplored topics. Most papers in accounting education literature are exploratory in nature and based on empirical data sets (Blondeel et al., 2024; Huber et al., 2024; Zotorvie et al., 2024), raising concerns about the replicability and generalizability of their findings. This state of the field piqued my interest and motivated me to adopt a comprehensive, quantitative machine-learning approach to provide a critical, in-depth examination of how this research stream has evolved across its past, present, and potential future.

Synthesizing past research has always been a crucial task for accounting and business scholars, as it allows them to present a comprehensive state-of-the-art analysis of a given topic while simultaneously identifying future re-

search directions through a critical analysis of findings (Doddaullarthi Basavaraj et al., 2024; You et al., 2024). The most traditionally used method for synthesizing existing research is the qualitative approach of a structured literature review. This method enables scholars to identify a focused sample of papers on a specific topic, analyze them critically, and derive insights into what has already been established and what remains to be explored. Given the extensive number of systematic literature reviews already present in the field of accounting education (Nurkhin et al., 2024; Paisey et al., 2024; Pargmann et al., 2023; Kroon & Alves, 2023), my goal is to introduce an alternative method—quantitative in nature and powered by machine learning—which, to the best of my knowledge, has not yet been applied to this domain.

Bibliometric methods are not new to accounting and business research and have gained increasing popularity in recent years, primarily due to the development of online repositories such as Scopus and Web of Science, which provide easy access to bibliometric data on thousands of scientific articles (Jankalová & Jankal, 2024). The accessibility of these resources, along with freely available tools for bibliometric analysis, such as VOSviewer, has made bibliometric research a viable alternative to traditional qualitative literature reviews. However, to date, only two notable attempts have been made to review accounting education literature using a bibliometric approach. Kumar et al. (2020) analyzed the scientific output of the Asian Review of Accounting journal, while Handoyo (2024) focused on the use of information technology in accounting classrooms. The latter study's insights, particularly its suggestions for future research into themes like gamification and curriculum modernization, inspired the present book, which aims to answer their call for further bibliometric studies.

The limited number of bibliometric reviews in accounting education underscores the uniqueness of this book, at least in my intentions. To distinguish my work further from that of Handoyo (2024), I aim to go beyond traditional bibliometric methods by employing a hybrid approach that integrates bibliometric analysis with machine learning techniques, specifically Latent Dirichlet Allocation (LDA). This combined method will allow for the identification and analysis of topics within the literature stream of accounting education research, as introduced in the first chapter of this book.

The decision to use a structured, bibliometric approach powered by LDA and machine learning stems from several considerations. First, as mentioned earlier, accounting education research currently lacks bibliometric studies, making this book a unique contribution to the field (Doddaullarthi Basavaraj & Jaya Prakash, 2024; You et al., 2024). Second, bibliometric methods offer significant advantages, including the ability to extract comprehensive infor-

mation on sources, articles, authors, and subjects, as well as to explore the interrelationships between topics and documents and their evolution over time (Singhania & Swami, 2024). Additionally, the transparency, academic rigor, and replicability inherent in bibliometric research protocols make them a valuable supplement to qualitative reviews, providing a holistic understanding of the field and its historical development.

Given my goal of making this book a single-source reference for scholars and practitioners interested in the current and future perspectives of accounting education, its scope extends beyond offering a comprehensive overview of the field. It also aims to provide a transparent and replicable set of guidelines for conducting bibliometric research powered by machine learning. By addressing the scarcity of bibliometric studies in accounting education, I hope this work will serve as a valuable reference for scholars seeking to explore or expand the use of bibliometric methods in this domain.

1.3. The Educational Scope of the Research

Accounting education is a vast field that encompasses a wide range of courses and activities. In the following sections, I provide an overview of the key areas of accounting curriculum discussed throughout this book to give readers a clear understanding of the scope.

Financial accounting is the branch of accounting focused on processing and recording financial transactions resulting from business operations over a specific period. These transactions are reported in various financial statements and documents, such as the balance sheet, income statement, and cash flow statement. Students studying financial accounting are introduced to the guidelines established by the Financial Accounting Standards Board (FASB), commonly referred to as Generally Accepted Accounting Principles (GAAP). Financial accounting is particularly popular among accounting students due to its high applicability in the professional world. Every registered company requires professionals with these skills to monitor financial performance over time, diagnose and resolve financial issues promptly, and manage expenses effectively.

Managerial and cost accounting courses, often taught in the second year of undergraduate programs or as part of graduate studies, are another critical area of accounting education. While there is some overlap with financial accounting—both involve the use of financial information—managerial accounting has a distinct focus. It emphasizes the interpretation and communication of financial and economic data to assist managers in achieving organizational goals. Unlike financial accounting, which is governed by accounting stand-

ards, managerial accounting is more strategic and flexible, aimed at helping managers make well-informed decisions based on collected data. These differences are significant enough that managerial and financial accounting are typically taught as separate courses.

In addition to financial and managerial accounting, other specialized courses fall under the umbrella of accounting education. Topics such as auditing, forensics, taxation, and fraud management are highly respected professions within the accounting field. These subjects are often included in business curricula alongside foundational accounting courses. Auditing, forensic accounting, tax, and fraud management share some challenges with financial and managerial accounting, particularly in preparing graduates to be job-ready upon completing their studies. However, these specialized areas are less frequently explored in academic literature compared to financial and managerial accounting. A similar trend applies to courses on accounting information systems, which are generally offered at the graduate level due to their advanced nature. Consequently, these courses are less commonly featured in scientific research.

1.4. A unique approach to bibliometric reviews: Latent Dirichlet Allocation topic modeling

In an effort to differentiate my book from existing literature reviews on accounting education, I adopt Latent Dirichlet Allocation (LDA) topic modeling to identify key and emerging themes from scholarly literature. Topic modeling (Blei, 2012) has grown in popularity due to the significant increase in accessible electronic document archives for scholars worldwide. Platforms such as Scopus and Web of Science provide immediate access to an extensive collection of records, all readily available for download.

As scholars strive to keep pace with the ever-increasing volume of scientific research being conducted and published, it is unsurprising that many have sought more feasible alternatives to manual content analysis. This method becomes impractical when analyzing large volumes of textual data. Consequently, researchers have turned to innovative techniques for detecting patterns in text and deriving insights from the vast amount of information available electronically through repositories like Scopus and Web of Science, as well as other online sources such as social media and websites.

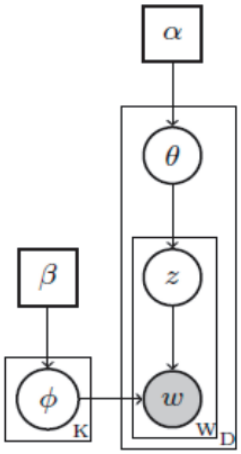
Topic models address this need by summarizing textual data through hierarchical probabilistic frameworks. These models reveal latent patterns in text by analyzing word usage and distribution throughout a document. This approach enables scholars to comprehensively understand the topics under discussion,

their relative importance, and the associated keywords (Zhang et al., 2017). The foundational premise of topic modeling is that documents represent a mixture of topics, and topics are, in turn, a mixture of words, all governed by probabilistic distributions. Another key assumption is the "bag-of-words" model, which emphasizes the occurrence of individual words over their order within the text.

Several types of topic models exist, including Latent Semantic Analysis (LSA), Probabilistic Latent Semantic Analysis (PLSA), LDA, and the Correlated Topic Model (CTM). These approaches have become increasingly popular in accounting research, particularly among reporting scholars (Maibaum et al., 2024; Park, 2024). They are also widely used in bibliometric studies due to their ability to process large datasets that would be impractical to analyze manually. For this book, I have chosen LDA, drawing inspiration from numerous established bibliometric research protocols that employ this technique (Dana et al., 2024; D'Amato et al., 2017).

As previously mentioned, LDA is a statistical model commonly used in natural language processing and machine learning for topic modeling in textual datasets (Ligorio et al., 2022). It uncovers latent topics in large document collections without requiring prior knowledge of the data's contents. In other words, LDA is an unsupervised algorithm that identifies latent topics without predefined assumptions. As a clustering algorithm, LDA employs a hierarchical Bayesian approach to derive these topics, making it particularly valuable for analyzing extensive textual datasets that would be too time-consuming for manual examination. Figure 1.1 below illustrates the LDA algorithm's workings.

Figure 1.1. – *Graphical representation of the LDA topic modeling algorithm*



LDA models assume that each document (D) comprises a mixture of latent topics (K), where each topic consists of a multinomial distribution of words (W) from the vocabulary. The parameters for the topics within a document are represented as θj, and the parameters for words within a topic are represented as φk.

Before conducting LDA analysis, the first step is to prepare the corpus for processing by the algorithm. In this research, the corpus was compiled by downloading the necessary bibliometric data from Scopus, which served as the primary database for this study. However, LDA requires specific preprocessing steps, making it impossible to use the raw data directly from Scopus without prior manipulation. This preprocessing involves "cleaning up" the text, which includes converting uppercase letters to lowercase, removing stopwords, numbers, and whitespaces.

While converting text to lowercase is straightforward, the removal of stopwords requires some explanation. Stopwords are words that are typically filtered out during natural language processing because they frequently occur but hold minimal significance for analysis. Examples of stopwords include "the," "is," "at," "which," and "on." These words are typically included in universally accepted stoplists or negative dictionaries. If retained in the corpus, stopwords can skew results and hinder meaningful interpretation. For this study, I employed the SMART (System for the Mechanical Analysis and Retrieval of Text) stoplist, available in the R Studio stopword package, to remove such words.

After preprocessing the text, the topic modeling method is applied, dividing the data into clusters of words, each representing a distinct topic. A key consideration at this stage is determining the optimal number of clusters or topics to derive from the model. Models with too many topics can become overly narrow, defeating the purpose of synthesizing large bodies of text. Conversely, models with too few topics can be equally problematic, as they include an excessive number of words per topic, making interpretation difficult. To ensure an effective balance, several tests are employed to assess model performance, as detailed below.

While topic models typically consist of five to ten clusters, more precise assessments are conducted using model-fit analyses. One common approach involves calculating the probabilistic model's log-likelihood score, where higher scores indicate better model fit. Additionally, the perplexity score measures the model's ability to predict the content of a sample; an optimal model features a high log-likelihood and a low perplexity score. Another key measure is the topic coherence score, which evaluates how well the top recurring words within a topic form a semantically meaningful cluster. This score

helps identify whether a topic is genuinely interpretable or merely an artefact of statistical inference.

The above tests will be conducted once the sample is extracted from Scopus, setting the foundation for the next section of this study.

1.5. Bibliometric overview of the Accounting Education field

As discussed above, while research exploring accounting education has been steadily growing, the current state of the field remains fragmented. Nevertheless, several significant contributions have emerged. When considering the substantial room for future development, the overall outlook appears promising for further advancements. In alignment with this perspective, I draw inspiration from the words of Handoyo (2024), who emphasized the need for further bibliometric efforts to critically evaluate the intersection of accounting and education. With this in mind, I aim to analyze current trends in accounting education and, in doing so, anticipate future developments with a proactive approach designed to bridge the gap between educators, scholars, and policymakers.

To enhance the bibliometric analysis, qualitative and quantitative research methods have been integrated into later chapters of this book. Data gathered from both students and faculty members complement the themes identified through quantitative bibliometric analysis, addressing prominent gaps and providing a richer understanding. Combining these approaches was deemed most effective, as it accounts for the complexities and nuances of blended learning adoption in accounting classrooms, the application of gamification, and the need to update accounting curricula.

The bibliometric analysis was conducted using the Scopus database (Alida Volkmer & Meißner, 2024). The keyword “Accounting Education” was adopted following established methodologies for reviewing scientific literature in this field. Scopus was chosen due to its widely recognized reliability for accounting and business research, as well as its extensive repository of scientific documents. Additionally, Scopus provides bibliometric metadata, including abstracts and keywords, which are essential for subsequent analysis.

The initial search yielded 2,180 distinct documents without applying any filters. Since Scopus includes a wide range of publication types, such as peer-reviewed journals, conference proceedings, and book chapters, a more stringent filtering strategy was necessary to exclude gray literature. To ensure the relevance and quality of the sample, two filters were applied:

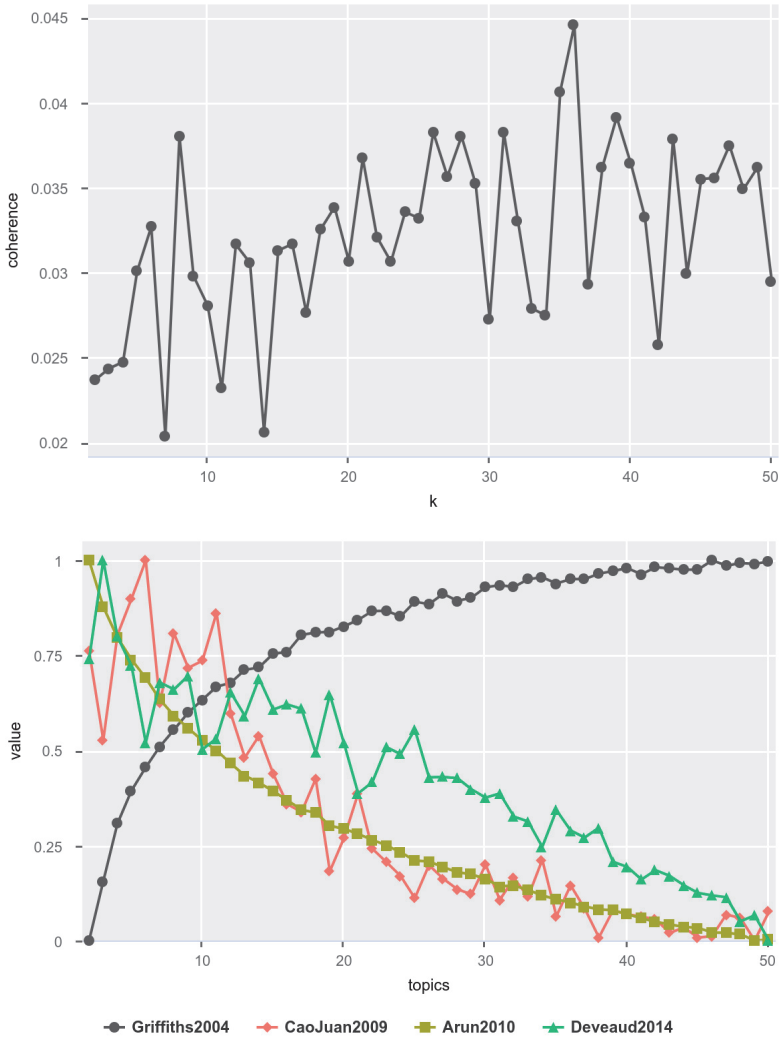
limiting the results to articles published in peer-reviewed journals within the accounting, business, and management domains, and restricting the sample to articles published in English. Homogeneity in language is crucial for bibliometric research, as multilingual datasets complicate text mining and analysis.

Following the application of these filters, manual screening was conducted to ensure the relevance of each record to the book's scope. While records featuring the keyword "accounting education" were retrieved, some were unrelated to the specific focus on teaching accounting in higher education institutions. A total of 87 records were excluded through this screening process. Additionally, chain referencing was performed by examining the reference lists of the manuscripts to identify further relevant documents. This step yielded an additional 67 records. After completing these steps, the final sample comprised 1,374 distinct records.

The bibliometric information extracted from Scopus was analyzed using RStudio and the Bibliometrix package, both of which are well-established tools for bibliometric research. Bibliometrix offers a range of functionalities, including co-citation analysis, cluster analysis, and descriptive statistics, making it a reliable and freely available option. Many bibliometric reviews have successfully employed RStudio and Bibliometrix for their analyses. For this book, I utilized Bibliometrix to provide a descriptive overview of the field of accounting education (Ramos Cordeiro et al., 2024). This analysis complements the deeper insights derived from machine learning techniques, specifically LDA topic modeling, discussed in earlier sections.

The data extracted from Scopus was formatted as a CSV file and processed using LDAShiny, an RStudio package. Preprocessing and cleaning steps, as outlined previously, were performed to prepare the data for analysis. Figure 1.2 below presents the model fit statistics from tests conducted in accordance with the LDA topic modeling protocol.

Figure 1.2. – *Model Fit Statistics*



In the context of my bibliometric analysis of the accounting education field, an 8-topic model was deemed most appropriate based on the results of the model-fit statistics tests. The coherence score peaked at eight topics, and the other metrics displayed significant kurtosis around the eight-topic mark. After identifying these eight distinct topics, the next step was to interpret and label them.

Although the LDA approach is quantitative in nature, the labeling of topics is interpretative and therefore inherently subjective and qualitative. In LDA,

each topic comprises a unique set of words, each associated with a specific distribution and frequency within the text. By analyzing the terms associated with each topic, it is possible to derive a label that best reflects the underlying theme.

To mitigate potential bias in my interpretation of the themes, I consulted a panel of accounting educators to validate my conclusions. The panel consisted of four higher education professors, each with decades of experience teaching accounting at the undergraduate and graduate levels. Their insights were instrumental in refining my understanding of the topics generated through LDA modeling and in identifying the relationships between them.

Table 1.1 provides a detailed breakdown of each topic, including their prevalence scores and the top terms associated with each theme.

Table 1.1. – *LDA Topic Models extracted from the sample*

topic	*label_1*	*coherence*	*prevalence*	*top_terms*
t_1	e-learning	0,068	13,168	students, e-learning, accounting, learning, student, education, use, group, distance, technology
t_2	students_ experience	0,008	12,692	accounting, students, engagement, education, learning, experiential, study, research, performance, ethics
t_3	expecta-tions	0,011	11,823	accounting, students, education, perceptions, professional, skills, study, accountants, audit, paper
t_4	accounting	0,028	12,913	accounting, education, curricula, teaching, paper, curriculum, professional, journal, course, knowledge
t_5	skills	0,026	12,713	accounting, students, education, skills, study, paper, professional, research, results, limited
t_6	research	0,018	13,264	accounting, education, research, students, engagement, study, results, data, games, creativity
t_7	curricula	0,009	11,46	accounting, education, content, paper, students, sustainability, approach, esg, financial, social
t_8	blended	0,031	11,967	accounting, education, systems, assessment, blended, learning, case, research, professional, platform

An extensive analysis of the themes extracted through topic modeling led me to identify three major research areas emerging from the scholarly literature on accounting education.

The first research area encompasses topics t_1 and t_8, focusing on how the delivery of accounting courses has evolved to embrace technological advancements and alternative methods of interacting with students. Terms related to e-learning and distance education are prominent in t_1, while t_8 highlights concepts such as blended learning and online assessments. Therefore, this first research area centers on the adoption of technology in accounting education.

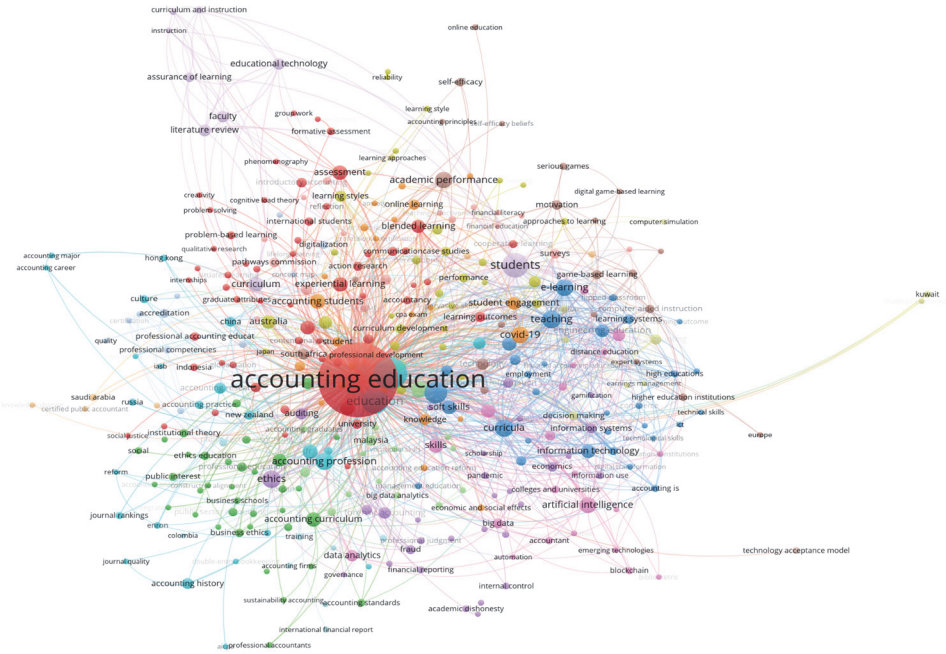
The second research area emerges from topics t_2 and t_6, which include terms associated with adopting alternative teaching and learning methods beyond traditional F2F delivery. Words such as "engagement" and "experiential" suggest that accounting education scholars have increasingly focused on alternative approaches to enhance student engagement. These include problem-based learning and game-based learning, which aim to foster greater interaction between students and educators.

The third and final research area includes topics t_3, t_4, t_5, and t_7, addressing the need for accounting educators to update current curricula to better align with changes in the professional environment and societal expectations. Terms such as "ESG" (environmental, social, and governance) and "sustainability" underscore the growing emphasis on these themes, reflecting the results of the bibliometric analysis.

Furthermore, the presence of terms such as "expectations," "skills," and "accountants" highlights the driving force behind this shift: employers' expectations for accountants with both traditional technical expertise and a more modern, comprehensive understanding of the field. This includes incorporating emerging trends and societal considerations into accounting education.

To further validate the findings from LDA topic modeling, I plan to conduct a bibliometric analysis using VOSviewer software. The results of this analysis are presented in Figure 1.3 below.

Figure 1.3. – *VOSViewer visualization of the keywords*



VOSViewer is a well-established, open-source tool frequently used in bibliometric research to derive and visualize connections between keywords, journals, and publications based on citations, bibliographic coupling, co-citations, and other bibliometric information (Ellili et al., 2024; Fatima & Singh, 2024; Owusu & Ofori-Owusu, 2024). In the context of this book, and given the need to provide a comprehensive overview of the accounting education field while validating the results of the LDA topic modeling, I employed VOSViewer to build a conceptual map of accounting education research based on keywords extracted from the abstracts of the sampled papers. The VOSViewer visualization confirms and validates the findings from the LDA topic modeling, revealing three distinct clusters:

The Red Cluster: This cluster broadly aligns with the second theme identified through LDA. It emphasizes the importance of stimulating student engagement and curiosity through alternative teaching methods, including problem-based learning and game-based learning.

The Green, Purple, and Pink Clusters: These clusters overlap with the third theme identified via LDA. They highlight the need for accounting curricula to evolve by incorporating emerging topics such as sustainability, ESG (envi-

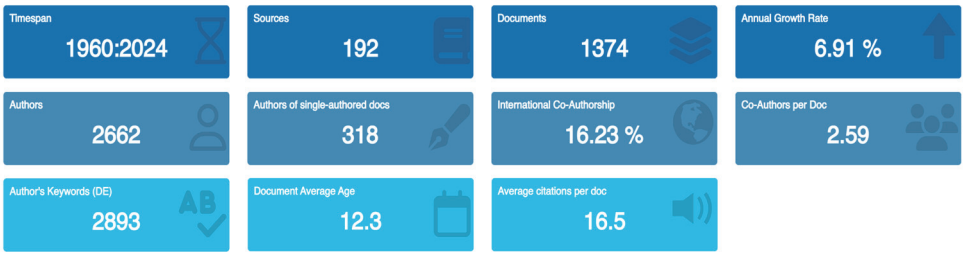
ronmental, social, and governance), and advancements in new technologies like AI and blockchain.

The Blue Cluster: This cluster corresponds to the first theme identified earlier through LDA. It focuses on the application of information technology to enhance the learning outcomes of accounting students, utilizing methods such as e-learning, synchronous and asynchronous activities, and other technological solutions designed to facilitate effective learning.

1.6. The current state-of-the-art of Accounting Education: a machine learning approach

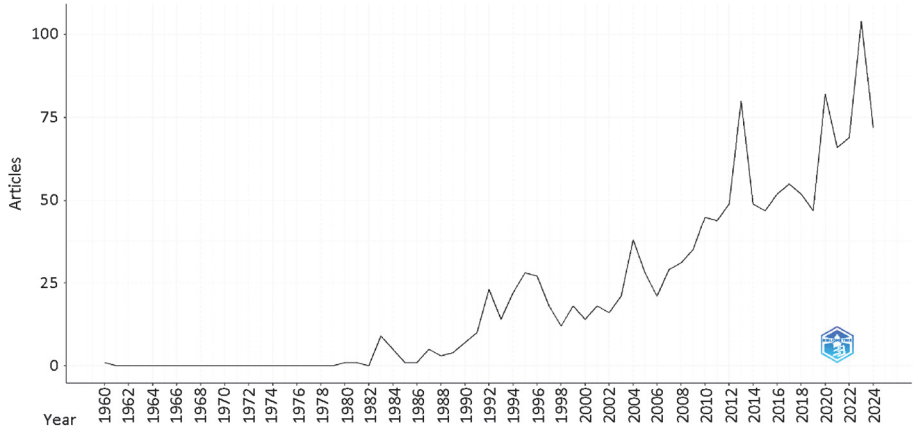
I would like to start the descriptive analysis of the sample with a straightforward, yet indicative look at a few numbers presented in Figure 1.4. below.

Figure 1.4. – *Information about the sample*



While the information presented is accessible and easy to understand, two key aspects deserve attention. The sample period spans from 1960 to 2024, encompassing 64 years of research in accounting education. Additionally, compared to broader management and business research, the relatively high proportion of single-authored records and the limited percentage of international co-authorships suggest that most accounting education papers are developed within national boundaries. Figure 1.5 below illustrates the annual scientific production within the sample.

Figure 1.5. – *Annual scientific production*



When examining yearly scientific production, a consistent trend emerges, reflecting a growing interest among scholars in accounting education research. Although the earliest record in Scopus dates back to 1960, the majority of available publications have been produced in the 2000s. It is important to acknowledge certain caveats when interpreting annual scientific production. For instance, the digitalization of scientific records and journals has significantly increased the accessibility of articles published in recent years compared to those from the 1980s or 1990s.

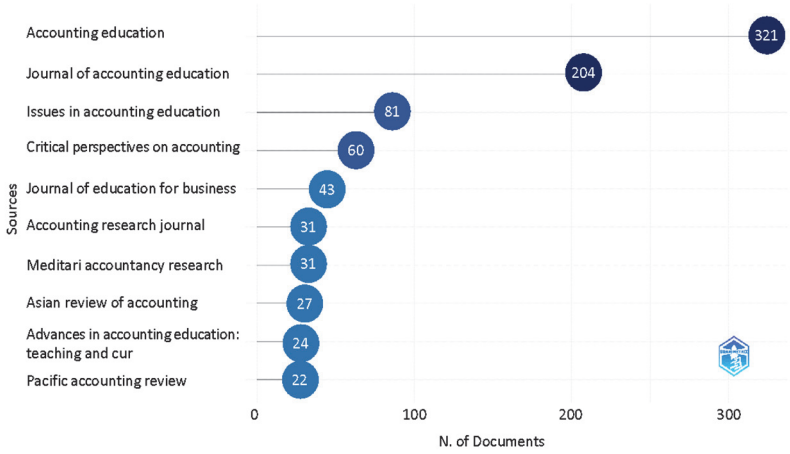
Nonetheless, some noteworthy insights can be drawn from the chart above. Accounting education research has mirrored broader trends in accounting scholarship, with a marked rise in production between 2012 and 2014. This pattern aligns with existing research, which highlights an increased focus on accounting topics in the aftermath of major economic crises, particularly those following 2009.

Additionally, there was a noticeable surge in accounting education research during and immediately after the COVID-19 pandemic. This suggests that scholars directed their efforts toward understanding how accounting classes were delivered during a time of unprecedented crisis. The peak in scientific production in 2023 underscores the sustained interest in accounting education, signaling that this focus is likely to persist as we move into the post-pandemic era. The field now grapples with questions about how accounting education will evolve in light of lessons learned from recent crises.

Overall, these findings indicate that the lull in accounting education literature noted by Apostolou et al. (2021) was likely a temporary disruption, stemming from the initial challenges of publishing during the early stages

of the COVID-19 outbreak. The broader trend, however, reflects steady and significant growth in scholarly interest. This renewed focus aligns with the heightened attention practitioners have given to accounting in recent years.

Figure 1.6. – *Most relevant sources*



Year

Regarding the most relevant sources, my main focus will be on which peer-reviewed journal has been the most prolific over the time frame under investigation. Accounting Education is, at the time of the publication, the most prolific source, with a total of 321 articles published, while the Journal of Accounting Education is in second place with 204 published. Issues in Accounting Education is third, with 81 articles published. While the top three journals may come with no surprise, as they are heavily focused on the subject of accounting education, the presence of Critical Perspectives on Accounting and Meditari Accountancy Research among the most prolific sources reveals that publication outlets that approach accounting through a critical lens are often interested in publishing articles exploring accounting education. The above is most likely due to the reflective nature of a significant number of accounting education articles, as scholars often attempt to rethink and re-interpret the established foundations of the accounting classroom, as technological advancements or changes in accounting curricula require them to stay critical of the field they operate in.

Figure 1.7. – *Sources Production over time*

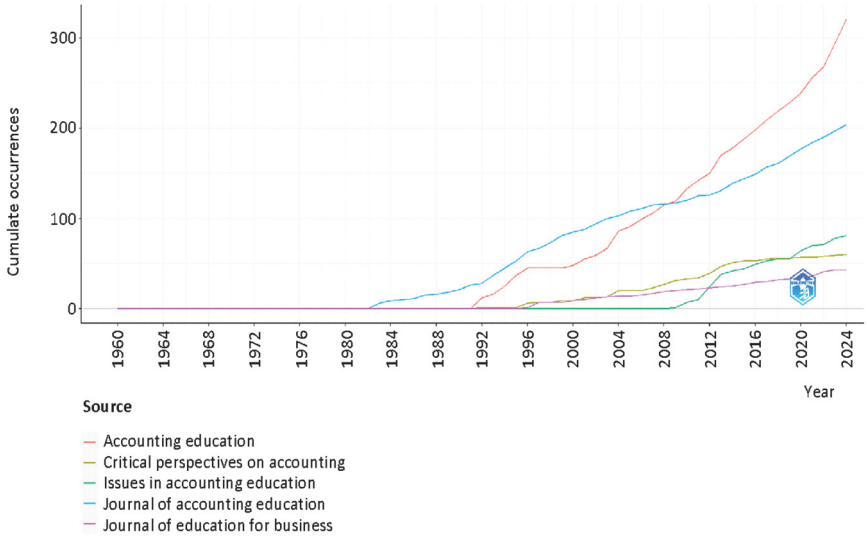
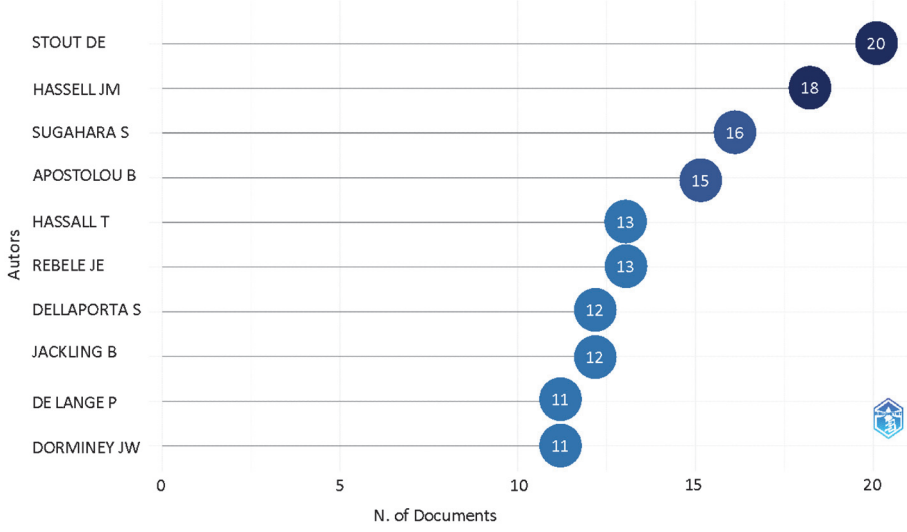


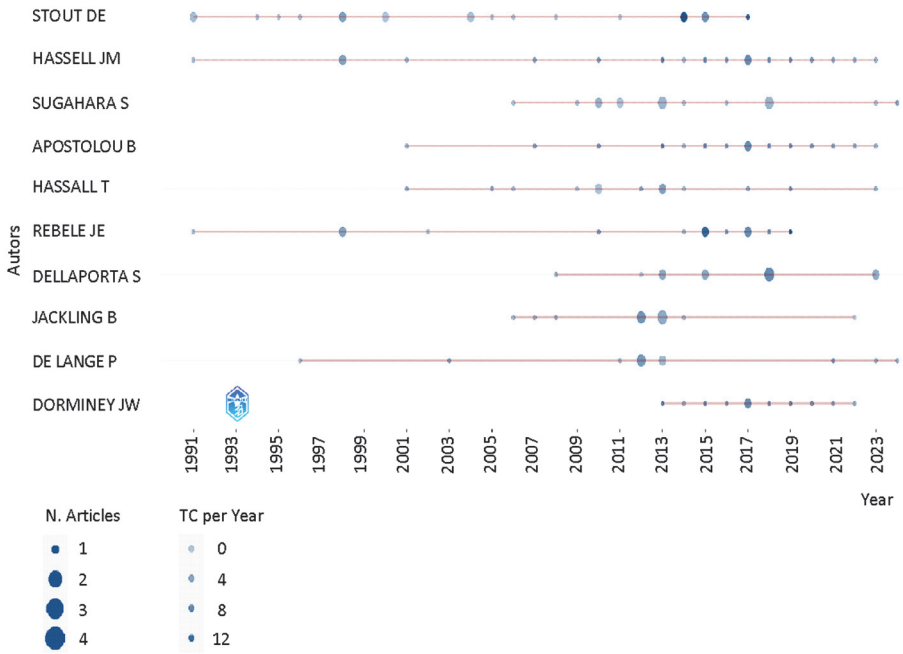
Figure 1.8. – *Most relevant authors*



When looking at the scientific production of accounting education authors, David Stout appears to be the most prolific one, with 20 distinct documents featured in the sample. Most of their production explored the need for accounting educators to widen the scope of competencies developed throughout

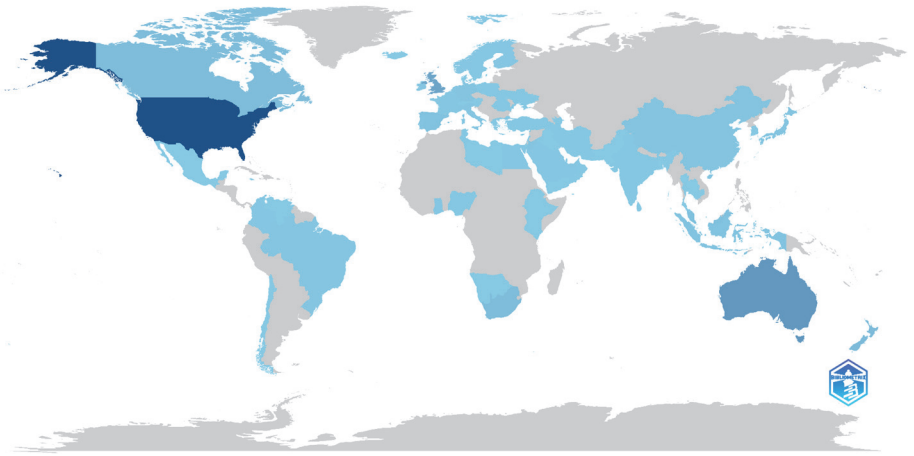
accounting classes, namely regarding business communication skills and leadership mindsets (Wygal & Stout, 2015; Lawson et al., 2015; Wygal et al., 2014). John M. Hassell follows shortly after as the second most prolific author in the sample. Their research efforts contributed to publishing several systematic reviews on accounting education over the years, as the field has often been reviewed and synthesized through a critical perspective (Apostolou et al., 2016, 2021, 2023). Furthermore, Satoshi Sugahara is the third most prominently featured scholar in the sample. Their research efforts vary, from teaching students cloud accounting to the effects of game-based learning approaches in accounting education (Sugahara et al., 2022, 2023; Sugahara & Dellaportas, 2018).

Figure 1.9. – *Authors' production over time*



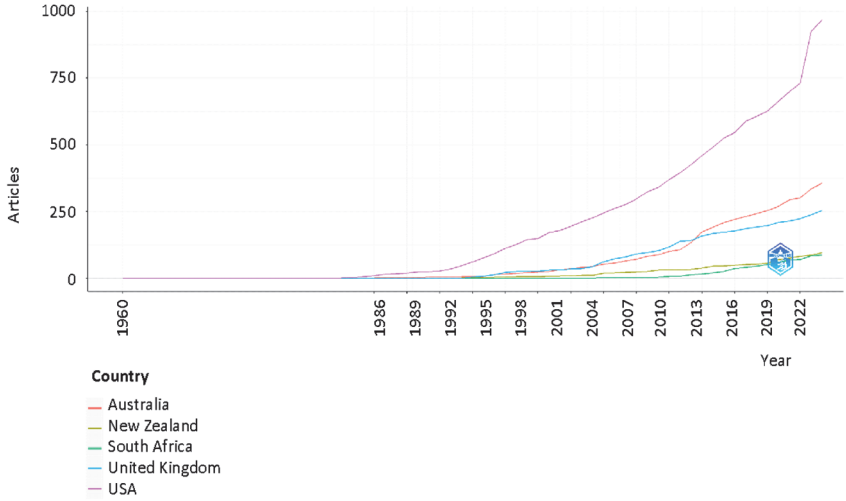
Having briefly discussed the research endeavors of the most prominent accounting education scholars, Figure 1.9. illustrates their scientific output over time. Data shows how their activity has been, for the most part, consistent throughout the past decades.

Figure 1.10. – *Country Scientific Production*



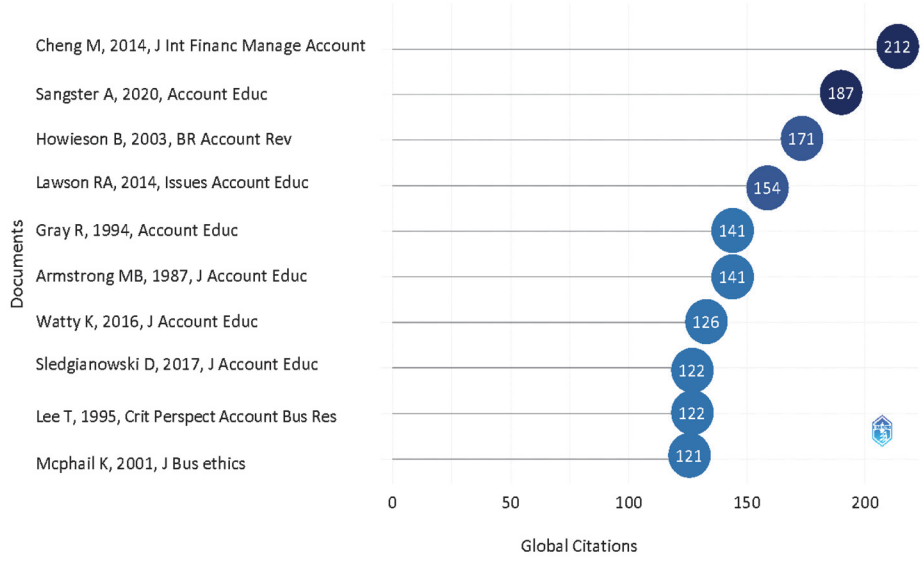
The darker the blue, the more prolific the country has been in publishing accounting education research, as far as our sample is concerned. As shown in Figure 1.10. above, a few factors come to mind when looking at the country-specific production. First, there is a significant dominance of the United States of America in terms of scholarly production, as the country in question is by far the most prolific among our sample, with 969 distinct records. It is followed by Australia in second place with 358, and the United Kingdom in third place with 255 records. A second takeaway is that non-English speaking countries are far less represented in the sample, thus leading the author to believe in a bias in how accounting education research is conducted. As most research is conducted in Western countries, empirical data is obtained from their higher education systems, with their own intricacies and peculiarities, making it difficult to generalize to countries employing vastly different education systems. In such regard, further research is welcome to provide better balance to the accounting education stream and insights from cultural contexts that have yet to fully explored and understood. It is worth noting, however, that for the sake of consistency when conducting text-mining, the author was forced to limit the sample to articles published in English, thus inevitably skewing the results towards production from countries where English is spoken primarily. Regardless, delving deeper into country-specific production, I will look into the country's production over time in Figure 1.11. below.

Figure 1.11. – *Country Production Over Time*



When looking at the country specific scientific production and its evolution over time, we note how the differences in volume are seemingly meant to grow more significant as time goes by. In fact, production from the United States of America has shown a rampant increase in recent years, with a notable spike in 2022, which further sets it apart from other countries that are still lagging behind. One interesting fact shown in the report is how scientific output from Australia has surpassed the one from the United Kingdom in fairly recent times (2012), whereas earlier the two countries were seemingly tied in terms of prolificacy.

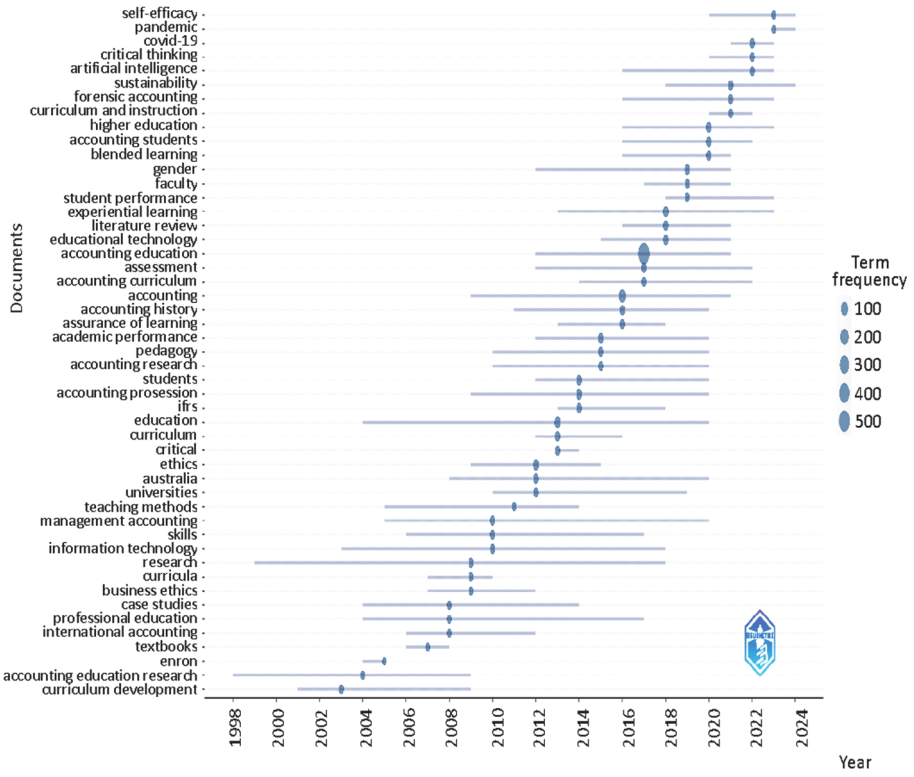
Figure 1.12. – *Most Globally Cited Documents*



Further, I would like to discuss the most impactful documents found in the sample regarding overall citations. The work by Cheng et al. (2014) is the most cited, even though its focus only partially falls within the conceptual boundaries of accounting education research. Still, despite the article reflecting primarily on the <IR> framework, it is inspired by a report made by a subcommittee of the International Association for Accounting Education and Research. It was pivotal in establishing <IR> as a core part of accounting education programs in later years. The second most cited document was published more recently by Sangster et al. (2020) and focused on the impact COVID-19 has had on accounting education as a whole. Drawing on the perspective of 66 distinct respondents, the manuscript delves deep into both the positive and negative outcomes brought about by the pandemic, ranging from the opportunity for educators to realign the formats and teaching strategies of their courses to better match modern standards to the stressful effects distance education has had on a specific portion of the student population. The third most cited document is by Howieson (2003), reflecting on the changes accounting education underwent at the beginning of the new millennium and how the profession was, according to the author, going to see accountants become progressively closer to business advisors in the coming years and decades. In hindsight, the work of Howieson (2003) correctly predicted the trends that characterized the accounting profession, as it is now widely understood to be much more adjacent to the business advisory and counseling realm compared

to its inception. A further analysis of the field and its evolution over time is provided below, as I will discuss the trending topics found in the sample and their historical evolution.

Figure 1.13. – *Topics Trends over time*



When having a look at the evolution of the trending topics over time, we can assess how the field of accounting education has changed throughout the years, often due to external factors that have influenced the scientific efforts of accounting scholars and educators. In fact, while initially the field seemingly placed its focus on curriculum developments and textbooks, I notice how information technology has immediately taken over the stream as soon as the new millennium began, with the term "information technology" being featured prominently from 2003 onwards. Another interesting aspect is the presence of "ethics" as a key term starting from the early 2010s, most likely following the major economic crises that have plagued the world during that time. In more recent times, we note the efforts pivoting towards inclusivity (keyword "gender") and experiential learning, as accounting education evolved in parallel

with societal needs and expectations from higher education institutions. The most recent keywords include “sustainability” and “artificial intelligence”, both topics of major interest for both academia and industry in present times, which are consequently reflected in the accounting education literature stream. As I will discuss in later chapters of the manuscript, their presence is tied to the need for accounting educators to reinvent the accounting curricula, in order to keep them updated with the current demands and expectations of the job market, which expects future accountants to be proficient with the use of AI and familiar with the topics of sustainability and ESG.

2.
Online Learning in Accounting Education: Lessons Learned from the COVID-19 Pandemic

This chapter explores a novel yet fundamental aspect of modern accounting education: the proliferation of online learning, and more specifically, blended learning, as a response to the changes brought about by COVID-19. Drawing on insights from a bibliometric review of accounting education literature, the chapter highlights the multifaceted nature of online learning in accounting education, its implications for students and educators, the challenges and barriers to its adoption, and the benefits it brings to the accounting classroom. Various dimensions of online learning are introduced and discussed, grounded in existing literature and identified gaps. A critical overview of the field is provided to equip accounting educators with a comprehensive understanding of student needs, to design coherent delivery methods, and to emphasize the importance of blended learning in today's fast-paced educational environment. The chapter concludes with an empirical case study based on the post-pandemic experience of the University of Turin, illustrating how blended learning was successfully integrated into existing accounting curricula. By presenting practical examples of this integration, the chapter underscores the pivotal role of digital technologies in enhancing the learning experience for accounting students and ensuring their long-term satisfaction with accounting education. Despite some challenges and barriers to adoption, the chapter emphasizes strategies educators can employ to overcome these obstacles and optimize learning outcomes.

2.1. Insights from the LDA topic modeling: a machine learning powered literature review

The unique challenges of accounting education lie in its close linkage with the accounting profession. Students expect to nurture and develop a skill set

that will enable them to seamlessly transition into the workforce upon graduation. Unlike more theory-based fields, accounting education places a stronger emphasis on practical and technical skills, making it inherently tied to the expectations of the job market and, more specifically, students' future employers. While this dynamic will be a recurring theme throughout the book, especially in Chapter 4, it is crucial to clarify from the outset how the expectations of the accounting profession shape accounting education programs. In alignment with this perspective, it is evident that trends affecting the accounting profession have increasingly shifted the expectations of both students and employers regarding educational outcomes and goals.

One of the most prominent trends is the rapid development of digital technologies. What was once considered a "nice-to-have" skill set has become essential, given the widespread adoption of AI, blockchain, and other digital solutions that future accountants are expected to navigate daily. Several scholars have observed that current educational programs have not fully aligned with the expectations of employers, who seek accounting graduates capable of thriving in workplaces defined by rapid technological disruption (Handoyo, 2024). In this context, it is fair to suggest that teaching and curriculum development have struggled to keep pace with these changes, contributing to a widening gap between academia and industry regarding the educational outcomes of accounting graduates (Indrayani, Sukoharsono et al., 2024; Theuri et al., 2024). The reasons for this divide are multifaceted, making it challenging to assign blame definitively.

However, some responsibility lies with accounting education scholars, who have occasionally only superficially addressed how to effectively integrate technology-based skill development into accounting education programs to better align with market needs (Suarta et al., 2024). Empirical and exploratory studies on this topic remain limited, leaving significant gaps to be addressed. I will explore this issue in greater depth in Chapter 4, focusing on the imperative for higher education institutions to update accounting education curricula to meet the evolving demands of the job market. Given this backdrop, proficiency with digital technologies is not merely an additional outcome of accounting education but should also serve as a vital tool for enhancing the quality of education for both educators and students.

In recent years, we have witnessed a significant shift in accounting education, as traditional course delivery methods have progressively transitioned into online learning formats. Although this shift began before the COVID-19 pandemic, the outbreak undeniably accelerated the trend. As a result, traditional F2F learning is increasingly supplemented by online learning solutions, which serve as alternative delivery methods or as channels for distributing

supplementary teaching materials and activities. This transition from F2F to online learning is particularly exciting—and challenging—in accounting education due to the unique nature of the field. Historically, the use of technology in accounting classrooms has lagged behind other disciplines, partly due to a divide among educators: some prefer traditional teaching methods, while others are early adopters of technological solutions. A review of the academic literature suggests that the most widely accepted approach is a hybrid model, where traditional F2F delivery is complemented by online learning activities designed to enhance student engagement. This often involves the use of Learning Management Systems (LMS) such as Moodle (Osgerby, 2013). As I will discuss in the next section, despite growing scholarly interest in integrating technology into accounting classrooms, several challenges arise for teaching staff, making this transition more complex than initially anticipated.

2.1.1. *Accounting Education and Digital Technology: the introduction of blended learning*

When it comes to online education, it is essential to distinguish between the concepts of digital technologies and digital platforms. Digital technologies encompass all the tools and devices students use to access courses. In recent years, with the advent of new and disruptive technologies, the number of devices students can use to learn has vastly increased, as teaching material can now be accessed through smartphones, laptops, tablets, or even smartwatches. As such, students now possess unprecedented flexibility regarding the fruition of teaching material, as everything can be accessed anywhere and anytime. Instead, digital platforms refer to the specific learning tools used to transfer knowledge and teaching material.

An example of digital platforms used in accounting education are Learning Management Systems (LMSs), which ASTD (2006, p. 2) defines as

> *"...software that automates the administration of training. The LMS registers users, tracks courses in a catalog, records data from learners, and provides reports to management..."*

Currently, the most popular LMSs include Moodle, Docebo, and Canvas. Despite differences in providers, LMSs share similar core features. Initially, LMSs were designed to host multiple courses, enabling students to access all course materials on a daily basis. However, LMSs are not solely student-centered; they also cater to teachers, staff, and tutors, who are responsible for regularly updating content and ensuring the teaching materials are easily accessible.

In turn, LMSs allow teachers to monitor student activity, assessing how students access and engage with course content, how they perform on quizzes and tests, and providing prompt support through instant messaging functionalities. At their core, LMSs function as online repositories for teaching materials, including lesson plans, course content, slides, supplementary readings, and assessments, all accessible online via various devices, including smartphones (Djajadikerta et al., 2021).

Although LMSs have been studied in education literature for over two decades, their application in accounting education remains underexplored, with only a few published studies. Further research on their potential would be particularly interesting, especially given recent advancements in information technology.

Having introduced the devices students use to access online teaching materials and the platforms facilitating these exchanges, I now turn to the educational processes involved in online accounting education. Broadly speaking, accounting education has lagged behind the wider field of education in adopting online learning (Dai, 2019). Nevertheless, a few promising research trajectories have emerged in recent years, likely driven by technological advancements reshaping the accounting profession.

One such trajectory is blended learning, inspired by the rapid proliferation of innovative workplace technologies. Blended learning combines traditional classroom instruction with physical attendance and digital media delivered through online platforms, such as the aforementioned LMSs (Raghavan & Thomas, 2014). Although students generally prefer traditional F2F learning (Weil et al., 2014), blended learning is often perceived as more effective than fully online learning without F2F interactions (Edington & Holbrook, 2010; Larkin, 2010; Yuen et al., 2009). Students value the opportunity to interact with instructors and receive real-time feedback on their progress.

However, the implementation of blended learning in accounting education presents challenges, with results that are often inconsistent and difficult to generalize. Parsons et al. (2020) highlight that both accounting students' and educators' attitudes toward blended learning vary significantly, largely depending on their familiarity with new technologies. Those with greater technological experience tend to approach blended learning more favorably, appreciating the flexibility it offers. Conversely, those less familiar with digital technologies are more resistant to blended approaches, often favoring traditional learning formats.

As noted by Krasodomska and Godawska (2021), however, the effectiveness of blended learning in accounting education is influenced by more than just technological familiarity. Factors such as students' nationality and cultural

background can also affect its efficacy. While their study did not identify gender as a significant factor, future research may yield different results. Additionally, external elements like institutional and technical support, as well as investments in technological infrastructure, play a crucial role in determining the success of blended learning (Wong et al., 2019). This suggests that its effectiveness is not solely dependent on students' characteristics.

Further challenges have also emerged in accounting research, as scholars point out the high expectations students nowadays have in regards to digitally delivered content, and their overall higher digital literacy. As such, blended learning might struggle to meet the learning outcomes of traditional F2F delivery, if its implementation and design are not consistent. In addition, scholars point out the discrepancies that might arise in terms of online assessment and formative feedback. In fact, while blended learning allows for more freedom and flexibility, on top of a stress-free learning environment, it also relies heavily on the students' sense of responsibility in engaging with the content at their disposal. With the COVID-19 emergency now behind us and some studies highlighting positive outcomes of blended learning in broader education, notably in terms of satisfaction, engagement and skill development, there is still ample room for future research to explore the nuances of blended learning application in accounting classrooms, specifically.

In conclusion, while a moderate amount of research has explored the implications of blended learning and the use of LMSs and digital devices in accounting education (Coovadia & Ackermann, 2020), more work remains to be done. The existing body of literature highlights several benefits of blended learning, such as increased autonomy and flexibility for students (Lento, 2017; Paz, 2016; Pinto-Llorente et al., 2017). However, digital technologies have yet to fully replace the value of traditional F2F interactions between students and educators. Even tech-savvy students recognize the importance of engaging with instructors and receiving direct feedback. They often feel that the "human" component of education remains difficult to replicate in an online environment.

This ongoing debate has characterized much of the past decade. As we navigate the post-pandemic future, it remains a pressing topic in accounting education, as will be discussed in the following section.

2.1.2. *Lessons Learned from the COVID-19 Pandemic: synchronous and asynchronous online learning*

Online learning originated in the early 2000s and has since seen widespread adoption in both educational and professional contexts (Shaw & Pieter,

2019). This is unsurprising given the extensive reliance of public and private institutions on Internet-based communication, whether through websites or dedicated platforms. For some, online learning represents a natural evolution of how organizations already use websites for marketing and information dissemination. Over time, the needs of students and workers—both increasingly dependent on online communication in their daily lives—have come to the forefront (Sipes & Ricciardi, 2006).

However, while creating an effective traditional classroom environment is challenging, replicating it in a virtual setting often proves even more demanding. Those aiming to teach accounting courses exclusively online face numerous challenges, which are summarized below.

The first challenge concerns maintaining a satisfactory quality of education compared to traditional teaching models (Vamosi et al., 2004). Research on this topic presents mixed and sometimes contradictory findings. This is largely because students' perceptions of "quality" extend beyond mastering lesson content. Nonetheless, from an academic performance standpoint, most studies agree that learning outcomes are comparable between online and offline teaching methods. Comfort and engagement, however, differ significantly (Hwang & Wang, 2004). Engagement, in particular, often becomes more difficult to foster in online environments due to the physical and psychological distance between teachers and students. Studies consistently show that interaction—both with instructors and peers—suffers significantly in virtual classrooms.

Despite these initial setbacks, research has continued over the past two decades, focusing on ways to address the unique challenges of distance learning. Engagement remains a cornerstone of the educational experience, though its dynamics differ markedly between in-person and remote settings. These differences are further shaped by the mode of course delivery—whether synchronous or asynchronous—which introduces additional complexities for instructors.

Engagement, broadly defined as the time and effort students invest in activities to achieve desired outcomes, is widely recognized as critical to effective learning. Academic literature often explores the connection between engagement and success, typically measured by final grades, while also examining the various factors that influence engagement. Most agree that students must play an active role in their learning, supported by strategies from instructors to encourage participation.

While these principles apply broadly to all forms of education, accounting education has unique considerations. Given the technical nature of many accounting courses, traditional teaching methods are often perceived as more effective, particularly for fostering interactive discussions and feedback loops on

numerical concepts. Asynchronous course delivery, a popular method for online accounting education, frequently leverages LMSs, such as the aforementioned Moodle (Osgerby, 2013). LMSs facilitate access to teaching materials—including recorded lectures and supplementary resources—while also providing opportunities for interaction through discussion threads and online chats. The flexibility of LMSs is especially valuable for management and economics students, many of whom are working professionals or engaged in long-term internships. As such, asynchronous engagement is considered a form of participatory learning, supporting hybrid approaches tailored to diverse student needs.

In contrast, synchronous online learning offers more immediate and dynamic social interaction. Although it demands greater organizational effort, synchronous teaching delivers real-time engagement and feedback. This format allows students to address learning challenges as they arise and enables instructors to promptly identify and resolve misunderstandings. The immediacy of synchronous learning enhances its ability to replicate some aspects of traditional classroom interaction.

Beyond platforms like Moodle, other technologies have been explored to support virtual accounting education (Mistry et al., 2024). A recent study examined the use of mobile applications designed to aid accounting education through interactive quizzes, leaderboards, and scoring systems. The results demonstrated that frequent users of these apps achieved higher exam scores than their less frequent counterparts. This validates the effectiveness of game-based mobile learning, a topic explored further in the following chapter.

2.2. Empirical Case Study

The drastic changes brought about by the COVID-19 pandemic and subsequent lockdowns profoundly impacted nearly all higher education institutions (Campillo-Ferrer & Miralles-Martínez, 2021; Chick et al., 2020). Accounting courses were no exception, as educators had to quickly reinvent their teaching methods to comply with lockdown measures mandated by governments and regulators. For many institutions, this meant a significant shift from traditional F2F instruction to synchronous online learning via platforms such as Google Meet, WebEx, and Microsoft Teams, adhering to social distancing guidelines. Although synchronous online learning was already a subject of research, the pandemic dramatically heightened scholarly interest in the topic. As a result, several institutions have retained some of the most effective innovations introduced during this period.

The findings from this emergent stream of research in accounting education are diverse and multifaceted, necessitating a critical perspective for their full understanding. For example, Mistry et al. (2024) explored levels of satisfaction with synchronous online learning in accounting education, examining whether individual traits—such as age and work commitments—affected students' preferences for specific teaching methods. Their study revealed that satisfaction levels varied significantly based on factors like age, enrollment year, work commitments, and commute distance, allowing the researchers to identify distinct student clusters. More specifically, they found that students with work commitments favored online learning, while graduate students preferred on-campus instruction, valuing social interactions with peers and faculty as key to their learning experience. The study concluded, consistent with previous research (Ahmadi et al., 2018; Dowling et al., 2003), by recommending a hybrid approach: theoretical content delivered through synchronous online classes and technical subjects, such as financial accounting, taught via traditional F2F methods. Similarly, Parker et al. (2024) examined the relationship between research and practice in student satisfaction with various course delivery methods. Their findings mirrored those of Mistry et al. (2024), demonstrating that accounting students' satisfaction with delivery methods depended heavily on personal factors, including their enrollment year and employment status.

Several key gaps inspired the case study I am featuring. Generally speaking, much research has been conducted to investigate the adoption and use of blended learning in broader higher education, yet limited empirical evidence has emerged from accounting classrooms specifically (Ahmadi et al., 2018; Dowling et al., 2003). Additionally, several questions regarding the adoption of blended learning remain unanswered, as most scholars have focused on its impact on students' academic performance or levels of engagement, partially neglecting the intricacies concerning its implementation (Campillo-Ferrer & Miralles-Martínez, 2021; Chick et al., 2020). A further gap justifying the inclusion of such a case study in the present book, is the author drawing data from a post-pandemic context in which blended learning and, more broadly, online education are progressively becoming the new norm, and not an emergency measure as they were during pandemic times Shaw & Pieter, 2019). As most research on blended learning has focused on said time frame and its contingencies, the data I provide effectively complements and expands upon them, providing insights from a post-pandemic future in which accounting educators are increasingly integrating technology into their teaching practices.

To delve deeper into the nuances of online accounting education and blended learning approaches, I conducted a qualitative case study at the University of Turin. Data collection took place between December 2023 and April

2024, using interviews and questionnaires distributed to accounting educators teaching both graduate and undergraduate courses. The study aimed to explore educators' perceptions of online accounting education during the pandemic, identify lessons learned from the transition to online learning, and assess how these experiences influence current practices and future expectations for blended and online learning. Given the unprecedented nature of the pandemic and the unique context of this research, a qualitative approach was deemed most appropriate, as it allows for an in-depth exploration of educators' experiences and insights (Sawan et al., 2024). This methodology also enabled me to examine their emotions, motivations, and perspectives, offering a more comprehensive understanding of their experiences with distance learning.

The choice of a qualitative approach was guided by several considerations. First, qualitative methods are well-suited for exploring the "how" and "why" of complex phenomena, which aligns with the goals of this research (Yin, 2009). Specifically, I sought to understand what accounting educators learned from the pandemic regarding online learning (Chick et al., 2020), how they are incorporating blended learning into their courses, and their outlook on the future of such teaching methods. Additionally, case study research is particularly effective for examining organizational processes, making it relevant for exploring not only educators' personal experiences but also the institutional support they received from their universities and colleagues (Hartley, 2004).

Yin (1984) further justifies the case study approach for extreme or unique situations. The COVID-19 pandemic represents such a case, given its unprecedented impact on higher education globally. The University of Turin provides a compelling context, as Italy—and Turin specifically—was among the first regions severely affected by the pandemic. This makes the experiences and insights of educators from this setting particularly valuable. Additionally, Yin (1984) argues that case studies are suitable when empirical evidence can offer insights into phenomena not yet fully explored in the literature. The case study of the University of Turin meets this criterion, given the scarcity of research on blended learning in accounting education and repeated calls for further evidence of its practical application.

2.2.1. *The Case Study of the University of Turin*

When the COVID-19 pandemic struck, Europe and China were among the hardest-hit regions, with Italy emerging as one of the first countries to enforce strict lockdown measures, known as "red zones." These regional lockdowns, initially applied to Lombardy, Emilia-Romagna, and Piedmont, were soon extended nationwide in an effort to curb the virus's spread. The repercussions on

Italy's local economy were profound, with businesses struggling to navigate the challenges and uncertainties of the rapidly evolving situation. Similarly, the University of Turin had to swiftly rethink its approach to course delivery, becoming one of Italy's first institutions to fully transition to online learning.

As a graduate accounting course tutor in 2020, I played a role in this unprecedented shift, experiencing firsthand the uncertainty and anxiety of the period. Despite initial challenges, the experience proved to be an invaluable learning opportunity for me and my colleagues. I believe the insights gained during this time offer a meaningful contribution to the existing body of knowledge on accounting education due to the uniqueness of the circumstances.

To provide context, the University of Turin, founded in 1440, is among Italy's most prestigious public universities, boasting over 83,000 students, faculty, researchers, and staff. Notable alumni include three Nobel laureates and two Italian Presidents. Its Department of Management offers a range of undergraduate and graduate accounting courses. The university's pioneering transition from traditional F2F classes to online learning during the pandemic makes it a particularly relevant case study. In the first year of the pandemic, classes were delivered exclusively online to minimize risks associated with student commuting. Over time, the university adopted a hybrid format, with in-person attendance allowed under strict safety protocols—such as mandatory masks—and a streaming option for remote learners.

This case study approach is further justified by the limited empirical evidence on the lessons learned from the Italian context regarding accounting education during COVID-19. While some studies have addressed this topic (Azzali et al., 2023; Tettamanzi et al., 2023), they primarily employ quantitative methodologies. Additional insights from international contexts (Kim & Rosacker, 2024; Makhlouf & Alani, 2024; Parker et al., 2024) underscore the need for qualitative contributions specific to Italy, given its distinct challenges and the intensity of the pandemic's impact.

To explore what accounting educators have learned from the COVID-19 pandemic, I conducted 27 semi-structured interviews with 16 accounting educators at the University of Turin. These interviews centered on three key questions:

1. *What lessons have been learned regarding blended learning from the COVID-19 pandemic?*
2. *What elements of blended learning are now pivotal in accounting education?*
3. *What is the future of online and blended learning in accounting education?*

All but three respondents had more than five years of teaching experience at the time of the interviews and had directly experienced the pandemic's im-

pact on education. Their teaching responsibilities spanned undergraduate and graduate courses. Respondents were selected through purposeful sampling, ensuring they had taught at least one blended course. Interviews were conducted F2F when possible or via telephone when necessary, with durations ranging from 30 to 80 minutes (averaging around one hour).

To prepare for these interviews, I gathered background information on each participant, focusing on their teaching experience. The interviews began with questions about their teaching experiences during the pandemic and how those experiences influenced their current practices. Subsequently, the discussion shifted to identifying elements of blended learning introduced during the pandemic that remain central to course delivery. The final segment of the interviews examined educators' perspectives on the long-term future of online and blended learning in accounting education.

After 27 interviews, I concluded that data saturation had been reached, as no new insights emerged—a common benchmark in qualitative research (Glaser et al., 1968). The collected responses comprehensively addressed the study's objectives, indicating that additional interviews were unnecessary.

Data analysis commenced with a thorough review of the interview transcripts. An iterative coding process was employed to interpret the open-ended responses. In qualitative research, coding involves assigning thematic labels (codes) to portions of text where latent meaning is identified. These codes, which can range in size from a sentence to a full paragraph, are then analyzed for relationships and grouped into second-order categories. Finally, these categories are synthesized into overarching themes based on their meanings and interconnections.

To streamline and enhance the coding process, I used NVivo, a widely utilized software for qualitative research (González-Varona et al., 2023; Nawaz et al., 2023). NVivo facilitated accurate and reliable text analysis, ensuring robust coding. The emergent themes, supported by key quotes from the interviews, are discussed in the following sections.

2.2.2. *Results: Insights from Italian Accounting Higher Education Teachers*

The abrupt shift necessitated by the COVID-19 pandemic compelled educators at the University of Turin to rely heavily on technology to navigate the constraints imposed by regional lockdowns. Online platforms such as WebEx, Google Meet, and learning management systems (LMSs) like Moodle became essential tools, requiring both students and educators to familiarize themselves with their advanced features.

Prior to the pandemic, the use of Moodle for online assessments was mini-

mal. However, with the onset of COVID-19, Moodle quizzes became a standard method for conducting accounting exams. This shift demanded significant effort from educators and students to adapt to and optimize the platform's functionalities. Moodle also became a cornerstone for course management, supporting a fully digital exam format and serving as a repository for teaching materials.

The courses I tutored during this period exemplified the pivotal role of Moodle and WebEx. Synchronous classes conducted via WebEx were systematically recorded and uploaded to Moodle, ensuring accessibility for all students. These platforms not only facilitated the continuity of education during the pandemic but also established a framework for blended learning that remains relevant in post-pandemic times.

Today, while most classes have returned to traditional F2F formats, Moodle continues to be a vital resource for delivering teaching materials and fostering a blended learning environment. Similarly, WebEx has retained its utility, now frequently employed in F2F settings to provide one-on-one support for students. These technological integrations demonstrate the lasting impact of the pandemic on educational practices, highlighting the importance of flexible and accessible learning tools in modern accounting education.

> *"I used to provide office hours exclusively offline, but after the COVID-19 pandemic hit, office hours went online only. Years after it ended, several students opt for online office hours due to their convenience."*

Consistent with prior research, flexibility remains a critical advantage of online learning. Insights gathered from accounting educators at the University of Turin align with this perspective, emphasizing the ability for students to catch up on classes at their own pace as a significant benefit. This flexibility is particularly advantageous for accounting students, who are often engaged in extracurricular activities, such as mandatory internships.

However, the findings indicate that fully blended learning has not supplanted traditional F2F delivery methods in accounting education. Respondents expressed concerns that making accounting classes freely available online for on-demand access might disincentivize active participation, potentially leading to diminished academic performance. This sentiment underscores the perceived value of structured, in-person engagement in fostering learning outcomes.

Another drawback identified through both firsthand experience during the pandemic and respondents' feedback was a tendency for some students to over-rely on teaching materials, such as mock exams or guided exercises with solutions, rather than investing effort in mastering core concepts. Educators

noted that this reliance often stemmed from reduced intensity or even the absence of meaningful interactions with instructors. This lack of engagement is seen as one of the most significant limitations of fully online and asynchronous learning formats.

In contrast, respondents highlighted the benefits of a more balanced approach that integrates F2F attendance with blended learning elements. Such an approach preserves the flexibility of online learning while maintaining the interactive, dynamic aspects of traditional classroom environments, which are vital for fostering deep comprehension and academic success in accounting education.

> *"Physical attendance of classes is simply impossible to replicate online when it comes to active involvement and participation of students. I noticed right away, as soon as the pandemic ended and students got back in class, how I could receive and answer many more questions and comments, as opposed to the often complete silence I was getting in online classes. I, thus, believe that while blended learning is indeed the future of accounting education, it should enrich the F2F educational experience rather than lead to a full distance learning future."*

Scholars of accounting education must carefully consider the obstacles associated with reduced interaction between educators and peers in fully online distance learning. The drawbacks extend beyond challenges in mastering course material; they also encompass significant limitations in fostering essential professional relationships. Respondents emphasized that the absence of physical attendance negatively impacts accounting students' ability to network and build connections with their peers, faculty, and staff—an aspect critical to their academic and professional development.

Given the inherently professional and pragmatic nature of accounting as a discipline, multiple respondents expressed concerns about the implications of a potential future shift toward fully online delivery of accounting courses. They highlighted the importance of maintaining opportunities for in-person interactions to cultivate the interpersonal and collaborative skills that are vital in accounting education and the profession at large.

> *"Students in accounting, more than in many other fields, benefit from the content we teach and the relationships they build-both with us, as instructors, and with their peers. Networking is crucial in accounting, and the virtual format makes it harder for students to develop those vital connections. I am concerned that a move toward fully online programs may limit opportunities for practical learning and professional growth."*

Delving deeper into the hypothetical future for accounting education in light of the COVID-19 pandemic has warranted exciting insights. Overall, despite the undeniable comfort distance learning offers in terms of time-saving and lessened dependence on commuting, students agree that virtual rooms and recordings cannot easily replace traditional F2F classes. Against the above backdrop, an intriguing line of thought concerns the future of accounting education and how higher education institutions offering fully online degrees are growing notably due to increased demands from potential students. Even though some respondents maintain that potential employers may prioritize hiring a candidate with a traditional accounting degree instead of one with an entirely online degree, the demand for accounting education to embrace innovation and technology as ways to rethink its delivery is undeniable.

> *"While students can gain technical skills through online programs, employers-especially in public accounting and large corporations-still value the soft skills and professional interactions developed in traditional or blended learning environments. Graduates from fully online programs, even with strong academic records, may find themselves at a disadvantage."*

The insights gathered from respondents highlight the importance of tailoring blended learning approaches to the specific educational objectives of each course. Some courses lend themselves more effectively to blended learning, while others benefit significantly from a fully F2F format. Based on the data collected, a widely accepted strategy is to prioritize blended learning for technically intensive courses that require substantial individual work and practice. Conversely, courses emphasizing group work, presentations, and interactive discussions should prioritize a predominantly F2F experience whenever feasible.

Another critical theme that emerged from the interviews is the necessity of a robust information technology (IT) infrastructure to support blended learning effectively. While the lack of IT infrastructure is often associated with rural or developing regions, challenges also surfaced in the present case study. For instance, occasional system malfunctions—such as WebEx failing to record a session properly or temporary internet outages—were identified as barriers to the seamless delivery of blended courses. Although some technical issues are unavoidable, institutions must prioritize establishing and maintaining a reliable IT infrastructure to support these educational models.

Additionally, educators must have opportunities to enhance their knowledge of information technology. For educators less experienced with digital tools, producing blended learning materials, such as video lessons, can be more time-

consuming and stressful than traditional F2F methods. During the pandemic, reliance on institutional technical support was commonplace. Although this reliance has diminished post-pandemic, respondents underscored that ongoing access to robust technical support remains essential for successfully integrating blended learning, particularly for educators less inclined toward technological adoption.

> *"Without proper training, it is easy to spend excessive time preparing the course, only to realize later that the design does not fully meet the learning objectives. The need for more guidance and support in designing these models is clear."*

Overall, summing up the results of my investigation and comparing them with extant literature, I note how the COVID-19 pandemic left us with some significant lessons we should learn from. In response to the forced reliance on distance education during regional lockdowns, both students and educators grew fond of traditional, F2F delivery of accounting classes, and stressed the importance of physical interactions, with both peers and educators. Whether it is for the sake of living the university experience to its fullest, to develop a professional network, or to hone social skills, respondents stressed the importance of traditional attendance in accounting education. In addition to the above, several key points were provided that I believe are worthy of consideration.

2.2.3. *Implications of the Case Study*

Given its uniqueness, I believe the case study of the University of Turin to be highly relevant for accounting education research for several reasons. Theoretically, it provides empirical evidence on how technology can be adopted in the accounting classroom and the specific drawbacks and benefits it entails. In addressing this, I complement a relevant research gap. From an empirical perspective, most accounting education research conducted during or after COVID-19 has focused on countries outside Italy (Pham & Vu, 2024). Given the peculiarities of the Italian context and the severe impact the pandemic had on the country, I believe my study effectively complements existing research and enriches the understanding of distance learning in accounting education. Additionally, it answers the call of Venkatesh et al. (2023), who urged scholars to provide more evidence on how information technology can enable or enhance the educational experiences of users. Finally, this study builds on the insights of Sawan et al. (2024), who explored how technology, blended learn-

ing, and the flipped classroom technique were applied in accounting education before the pandemic, calling for further research to supplement their findings with data from the COVID-19 era.

Tettamanzi et al. (2023) posited that distance learning took a secondary role in post-pandemic years within the Italian academic system, with the learning experience being prioritized in the organization of educational programs. Building on their call to explore perceptions of blended learning in "normal" post-pandemic times, I find its relevance somewhat increasing due to stricter standards set by students, competition from institutions offering fully online degrees, and the disruptive potential of technological innovation. Yet, as my findings contribute to advancing accounting education research (Dragomir & Dumitru, 2023) by showing how teaching activities are adapting to this evolving scenario (Sollosy & McInerney, 2022), I find blended learning remains a "nice to have" rather than a core value proposition of traditional accounting classrooms. While the COVID-19 emergency might now be behind us, this could pose a danger, as it may lead higher education institutions to lose the drive to proactively rethink delivery strategies, leaving room for more innovative universities to meet market demand more effectively.

The COVID-19 pandemic significantly altered student expectations regarding the delivery of accounting classes (Campillo-Ferrer & Miralles-Martínez, 2021), creating high demand for online and distance learning following their forced implementation during the pandemic (Makhlouf & Alani, 2024). What is notable about this case study is that, despite efforts to integrate blended learning into accounting courses, concerns remain that part of this demand is unmet, potentially driving some students toward fully online degrees. While, at the time of this study, traditional accounting degrees are still perceived more favorably by employers than fully online alternatives, cultural shifts could change this perception, impacting how traditional accounting courses are delivered.

Several obstacles to adopting blended learning have emerged. One, not yet fully addressed by accounting scholars, involves the need for educators to be trained not only in the technical aspects of online education but also in designing effective and seamlessly integrated blended learning elements. Another concern is more technical and relates to the availability of adequate technological infrastructure to support blended learning. While the institution in this case study experienced only minor issues, others may face greater challenges in building infrastructures that enable blended learning to function effectively.

In addition to the theoretical and empirical implications, this study presents practical recommendations for accounting faculty and practitioners. First, further reflection is needed on online learning evaluation systems. Currently,

most exams at the institution I investigated are conducted in a traditional pen-and-paper format, with online activities occasionally contributing supplementary points but not forming the core of assessments. Given that blended learning encompasses assessment, accounting educators should consider the feasibility of online assessments conducted in person with student devices.

Second, the future of online learning demands a rethinking of traditional accounting degrees to meet modern market demands. My recommendation is that faculty and practitioners not allow the momentum from the COVID-19 pandemic to wane. Instead, they should continue investing in the constant innovation of accounting education. While employers may currently favor traditional degree formats, particularly at the undergraduate level, this should not justify a lack of innovation. As cultural paradigms shift rapidly, traditional accounting education risks falling behind more forward-thinking approaches.

2.3. Profiling the future research directions of Accounting Education: Online Learning in Accounting Education

Distance learning may have been an effective way to mitigate the impact of COVID-19 on education and the barriers imposed by regional lockdowns (Arfaoui & Kammoun, 2023). However, while its adoption during the pandemic allowed higher education institutions to continue providing courses, skepticism persists regarding its effectiveness in consistently training future generations of accountants in post-pandemic times. Research on the efficacy of online accounting education remains fragmented and contradictory (Ackermann, 2021; Aldahray, 2024; Imran et al., 2023; Misseyanni et al., 2018; Papageorgiou, 2014), with no unanimous consensus reached. Yet, as emphasized by Tettamanzi et al. (2023), research in this area is now more critical than ever as institutions navigate their post-pandemic futures and consider innovative solutions for delivering educational services.

Given the heightened focus on ESG and sustainability in higher education, the debate surrounding online accounting education will inevitably shape the field's future. Institutions are increasingly exploring sustainable course delivery methods that minimize the environmental impact of student transportation to on-campus classes.

A further research avenue will emerge over time, as studying the long-term effects of digital pedagogies in accounting education (Coovadia & Ackermann, 2021) promises to be compelling. Solutions like blended learning, for example, may significantly impact student outcomes over the long

run. Additionally, the global rise of online universities and their growing popularity in recent years present a noteworthy area for research. A comparative approach to traditional and online education could uncover differences in student satisfaction and learning effectiveness. Research focused exclusively on online campuses remains limited, and as their prevalence grows, this gap presents an exciting opportunity for accounting scholars to contribute to the field's development. "Open universities" offering fully online degrees often attract a distinctly different student demographic compared to traditional institutions, with students typically being older and part of the workforce (Morgan & Ihrke, 2013). Insights from these students could differ significantly from those already available and enable accounting educators to gain a broader understanding of what students seek in blended learning (Chytas et al., 2022).

Another line of research could explore the need for accounting educators to enhance their digital skills to effectively implement blended learning. As shown in my case study, a general lack of digital literacy does not necessarily reduce teaching quality but can lead to negative externalities, such as significant time and effort spent ensuring systems function correctly. This, coupled with occasional resistance to blended learning and new technologies, warrants further investigation to identify underlying issues and potential solutions.

From my literature review and insights gathered from respondents, another research avenue involves examining how the shift to a more student-centered approach in accounting education, typical of blended and asynchronous learning, presents specific challenges (James et al., 2024). First, it requires students to be proactive and skilled in time management. Second, it expects them to develop learner autonomy and independence (Gómez-Contreras & Bonilla-Torres, 2020). While these skills are deemed essential for future workplace performance, they also highlight deficiencies in how accounting education is currently delivered. Scholars could investigate online learning assessments, exploring how they can maintain student engagement and commitment throughout a course. Another intriguing question is whether blended learning impacts dropout rates in accounting programs. To date, broader education research offers conflicting evidence, necessitating further studies to determine if blended learning has such negative effects.

Finally, further research could assess the effectiveness of hybrid approaches to blended learning and their impact on student performance. Several questions remain unanswered in accounting education, as scholars have yet to determine the optimal balance between F2F delivery and asynchronous learning. For example, would a course primarily delivered online through

asynchronous, pre-recorded classes with occasional F2F interactions with teachers or tutors provide an effective learning experience? Alternatively, would online lectures combined with F2F, practice-oriented tutorials yield better results than online tutorials and F2F lectures? Understanding the ideal balance between these approaches remains a gap in the accounting education literature.

3.
Accounting Education and Gamification

Student engagement has always been a vital aspect of teaching and learning, and accounting education is no exception. Defined as the time and effort students invest in educational activities, student engagement has been the subject of numerous scientific studies, as scholars and educators strive to discover innovative ways to enhance engagement and cultivate a dynamic learning environment. Notably, engagement influences more than just the enjoyment students derive from attending classes. Research indicates that student engagement has a statistically significant impact on learning effectiveness and academic performance across all education levels. Furthermore, student engagement has been positively linked to retention, a recurring theme in scientific literature. Broadly speaking, scholars concur that higher student engagement increases the likelihood of continued, proficient study over time. This chapter examines the shift in accounting education delivery methods and explores how student engagement has become a focal point for accounting scholars globally. It does so by presenting insights from a panel of accounting students who shared their experiences with game-based mobile learning solutions, identified by the authors as a critical gap in the intersection of gamification and accounting education.

3.1. Insights from the LDA topic modeling: a machine learning powered literature review

Before exploring the use of gamification in accounting education, it is crucial to thoroughly understand student engagement, as it represents the primary outcome of game-based learning. Student engagement is a complex, multifaceted concept, prompting the development of various theoretical models over the years to capture its nuanced nature (Mahmud et al., 2020). Recent frameworks conceptualize engagement across multiple dimensions, including cogni-

tive, psychosocial, relational, and behavioral aspects. In essence, student engagement extends beyond the information students absorb during their educational experience; it encompasses the enthusiasm, interest, and sense of belonging they feel in class, as well as the quality and quantity of their interactions with teachers and peers (Schindler et al., 2017).

Research indicates that traditional lecture-based F2F teaching methods should integrate more interactive and collaborative elements to enhance the overall teaching and learning experience. Active learning approaches have been empirically linked to higher information retention and greater motivation, driving the ongoing scientific debate around innovative teaching methods. Many scholars argue that students learn more effectively in enjoyable, iterative environments. These settings encourage students to pursue knowledge independently, foster creativity, and develop critical thinking skills.

In line with the discussion above, scholars have increasingly focused on gamification as a potential means to boost student engagement and foster a more interactive, innovative classroom for accounting students. Gamification enhances engagement through elements like badges, levels, and leaderboards, offering opportunities for collaboration, active participation, and sustained interest. However, the scientific community has yet to reach consensus on the benefits gamification brings to classrooms, including accounting ones. Critics argue that students may engage with game-based activities solely to achieve extrinsic rewards, such as badges or additional exam points, rather than to develop the knowledge and skills these activities are intended to cultivate.

The fragmented and conflicting research on gamification in accounting education motivates this chapter. By providing a comprehensive overview of scientific developments on the topic, I aim to inform readers about the current state of research and potential future directions. Additional inspiration comes from Zainuddin et al. (2020), who called for updated literature reviews on gamification in higher education, incorporating insights from recent years. Given the pandemic's impact on technology use in accounting education, now is an opportune moment to conduct a bibliometric analysis of recent research to examine changes influenced by COVID-19 and identify future trends.

While empirical studies have explored accounting students' perceptions of gamification, significant gaps persist in the literature, as I will demonstrate in subsequent sections. To address these gaps, I employed a quantitative approach using partial least squares structural equation modeling (PLS-SEM) with an international sample, rather than replicating existing case study designs. This research aims to complement prior work by examining

factors influencing gamification adoption, students' perceptions, and the role of mobile devices in accounting education, thereby contributing new insights to the field.

3.1.1. *Challenges and Barriers to Gamification in Accounting Education*

An important theme emerging from the analysis is the challenges and barriers to adopting gamification in accounting education (Mahmud et al., 2020). A primary concern is the lack of generalizability in gamification research, which is often empirical and exploratory. Scholars have noted that its integration into accounting classrooms may not always meet educators' expectations. Point-based systems, badges, and leaderboards (Ding et al., 2017; Mekler et al., 2017) are criticized for failing to foster a sense of community within the class. Addressing these concerns requires careful planning, as educators must tailor the gaming experience to suit the specific needs and interests of accounting students.

Another significant issue arises when considering the nature of students' interest in games. Scholars caution against incorporating compulsive gaming behaviors into accounting education (Mahmud et al., 2020). Compulsive gaming, scientifically explained as gamers seeking dopamine-driven gratification, poses risks when it extends beyond healthy escapism. When students fail to limit gaming and develop an unhealthy fixation, it can lead to addiction-like behaviors with negative side effects.

Consistent with these concerns, scholars warn that gamification in higher education could amplify existing unhealthy trends, potentially harming academic performance and learning outcomes. By leaning into addictive gaming tendencies, gamification risks prioritizing short-term engagement over meaningful, long-term educational benefits, underscoring the need for thoughtful implementation to avoid unintended consequences.

Another barrier to gamifying the accounting classroom lies in the inherent complexities of its adoption (Chapman & Rich, 2018). Integrating game-based learning is rarely seamless and often requires resources and infrastructure that may be unavailable in certain institutions. For instance, lecturers' familiarity with game-based solutions is crucial to their effective implementation. Educators must understand how the games function, how to integrate them into teaching, and how to evaluate student performance using these tools. Such preparation demands time, willingness, and an open mindset from lecturers. Moreover, games requiring internet access or online platforms depend on institutional technical support, adding another layer of difficulty to adoption (Lozano et al., 2017; Sugahara & Dellaportas, 2018).

Additionally, studies reveal inconsistent findings regarding the effectiveness of alternative learning methods compared to traditional F2F approaches in accounting education (Hwang et al., 2008; Opdecam et al., 2012). Students accustomed to traditional methods may not find alternative approaches more appealing or effective. Furthermore, given the multiple-choice format of CPA (Certified Public Accountant) exams, accounting students may view alternative assessment methods as less relevant to their exam preparation.

Ultimately, there is no universally correct teaching approach in accounting education, as the field encompasses diverse experiences and perspectives. However, by thoroughly analyzing the game-based learning methods that have garnered scholarly attention over recent decades, we can better understand what has been successful and where challenges persist, offering valuable insights for future implementation.

3.2. Gamification in Accounting Education

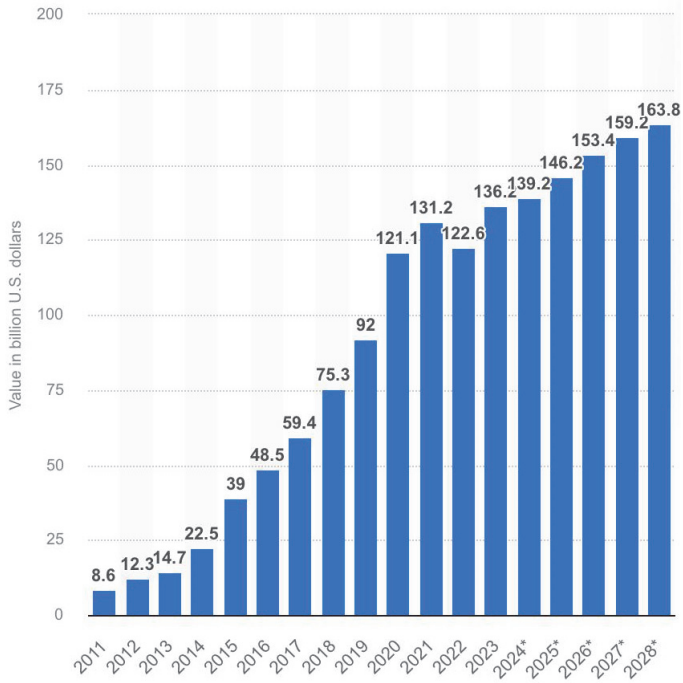
3.2.1. *Mobile Game Learning in Accounting Education*

The literature on the benefits of gamification in accounting education remains limited, as the field is still evolving. Nonetheless, several noteworthy contributions merit critical discussion. Broadly speaking, when evaluating the scientific work for or against gamification in accounting education, most studies conclude that game-based learning has a positive impact on teaching and learning outcomes for accounting students.

Before the COVID-19 pandemic, only a handful of publications addressed the use of games in accounting classrooms (Fratto, 2011; Moncada & Moncada, 2014; Nitkin, 2012; Shanklin & Ehlen, 2007). However, scientific output in this area has grown significantly with technological advancements and the widespread adoption of online learning platforms during the pandemic.

A parallel trend can be observed in the gaming industry, particularly in the mobile gaming sector. The popularity of mobile gaming surged during the COVID-19 pandemic (Aldahray, 2024), coinciding with higher education institutions' increased reliance on online learning tools. This overlap suggests that the rapid technological shift influenced both gaming and educational practices, creating new opportunities to explore gamification as a teaching strategy in accounting education.

Figure 3.1. – *Mobile gaming content market value worldwide from 2011 to 2028*



Source: Statista.com.

With the widespread adoption of smartphones globally, the gaming industry has increasingly targeted this market, with mobile devices now accounting for more than half of its total revenue. Mobile gamers display high levels of engagement, often playing daily. Accounting educators may have observed this firsthand, noting how students in the classroom frequently appear glued to their mobile devices, checking notifications or engaging in quick gaming sessions.

Given that prohibiting mobile device use in classrooms or workplaces has become nearly impossible, accounting scholars have turned their attention to integrating these devices into the learning environment rather than banning them outright. As early research began to reveal positive developments, more scholars have explored the implications of mobile gaming within the classroom, largely reporting favorable outcomes. This growing interest highlights the potential of leveraging mobile gaming to enhance student engagement and foster more interactive learning experiences.

Given the extensive use of mobile devices by students, it is unsurprising that accounting educators are interested in adopting mobile gaming apps to

enhance teaching experiences. Unlike traditional gaming systems such as consoles or computers, mobile devices enable users to play games anytime and anywhere, often through quick, easily resumable sessions. In accounting education, game-based learning has shown effectiveness in prior research. However, its full integration into higher education curricula remains limited, partly due to challenges in finding games specifically suited to accounting classrooms. This barrier also complicates research efforts, as it restricts scholars' ability to collect empirical data on the effectiveness of mobile learning (Voshaar et al., 2022).

The body of scholarly work on game-based mobile learning in accounting education appears uneven. Most studies have focused on the positive effects of gamification on student performance and learning experiences. While these findings are promising and suggest that game-based mobile learning could play a crucial role in the future of accounting education, relatively few studies address its limitations. These include barriers to implementation, its potential negative impact on students' attention spans, and its influence on attitudes toward traditional F2F learning over the long term.

3.2.2. *Board Games in Accounting Education*

Despite the popularity of mobile devices, accounting education research has also explored various alternative methods for incorporating game-based learning into classrooms. One notable example is board games, with Shanklin and Ehlen (2007) among the first to demonstrate their effectiveness in illustrating the accounting cycle. Unlike mobile games, which often provide a solo experience, board games encourage F2F interaction, fostering discussion and engagement during the learning process (Selamat & Ngalim, 2021). A handful of studies have examined the use of board games in financial accounting (López-Hernández et al., 2022; Shanklin & Ehlen, 2007), consistently finding positive impacts on student engagement. López-Hernández et al. (2022) specifically highlighted how the board game Accounting Marathon improved students' self-efficacy, leading to enhanced self-perceived academic performance.

However, implementing board games in accounting classrooms is not without challenges (Wood, 2023). Monopoly®, one of the most well-known board games, has attracted the attention of accounting education researchers aiming to use it as a teaching tool. Knechel (1989) was an early adopter, introducing Monopoly® in an undergraduate financial accounting course to teach journal entries. The results, however, were mixed, with criticisms citing low student interest and the game's limited ability to improve topic compre-

hension. Subsequent studies (Mousa, 2019; Tanner & Lindquist, 1998; Shanklin & Ehlen, 2007) revisited Monopoly®, reporting more favorable outcomes. These later efforts demonstrated the game's potential to enhance engagement and motivate students to develop critical thinking and decision-making skills.

Thus, I believe board games can be effective in accounting classrooms if educators carefully tailor the gaming experience to align with the intended learning objectives.

3.3. Case Study – Partial Least Squares Approach

3.3.1. *The perspective of accounting students on game-based learning: a PLS-SEM approach*

Several empirical studies have explored accounting students' perceptions of gamification (Jamaluddin et al., 2017), yet significant gaps remain in the literature. The abundance of case studies examining gamification adoption in accounting classes led me to avoid using a similar research design for this book, as it would risk redundancy and fail to offer fresh insights. Instead, I chose a quantitative research design employing partial least squares structural equation modeling (PLS-SEM) with an international sample of accounting students (Al-Okaily, 2024; Lutfi et al., 2024; Nitzl, 2016).

This approach aims to complement existing research by providing new quantitative evidence, addressing both methodological innovations and theoretical gaps. The results will be compared with existing exploratory studies to foster a more comprehensive understanding of the current state of game-based learning in accounting education. By adopting this approach, I hope to contribute meaningful and novel insights to the ongoing scholarly discussion.

More specifically, the same prominent gap I found through my bibliometric observations of the field was previously highlighted by Silva et al. (2021), who stressed the need for mobile gamification research to explore the factors influencing its adoption, understand how students perceive its usefulness, and the extent to which they are willing to keep using game-based learning in their learning endeavors. As pointed out by Hwang and Tsai (2011) research on game-based mobile learning is currently needed, most notably due to the fact that mobile devices are incredibly popular in younger generations, thus investigating their use for accounting education could provide unique perspectives and insights. Additionally, Haugland Sundkvist and Kulset (2024) urged future research to adopt the UTAUT model (Venkatesh et al., 2012), in order to

understand the habits and the hedonic motivations of students engaging with innovative forms of learning.

Given the research gap found above and the rather specific nature of the questions set forth by previous scholars, I intend to provide an answer by adopting a quantitative approach based on a theoretical model that I will describe further below. The integrated use of two theoretical frameworks, namely the Expected Confirmation Model (ECM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), serves as the theoretical backdrop for the study (Alzaidi & Shehawy, 2022; Singh, 2020). ECM is a robust set of theoretical lenses, originally mutuated from the Expectation Confirmation Theory (ECT) and Technology Acceptance Model (TAM). It has often been combined with other frameworks, such as the TAM and the theory of planned behavior (TPB). Even though the model has primarily been adopted to explore the use of technology in accounting education as a response to the constraints set forth by the COVID-19 pandemic, it is valid when it comes to game-based learning as well, since often it is enabled by specific technologies used in the accounting classroom (Sugahara et al., 2022). It has been recommended that the factors motivating accounting student educators to maintain the adoption of game-based learning technologies over time be explored. As such, the integration of the two theories offers valuable insights.

A few contributions are expected from the research, both empirical and theoretical. At present, significant research gaps have been identified throughout my review regarding the implementation and continuous usage of mobile learning in accounting education. Even though some research has been conducted, most prominently in fields other than accounting, empirical evidence from accounting students specifically is lacking. I will achieve the above by combining the ECM and the UTAUT frameworks, and explore the factors connected to the adoption of game-based mobile learning solutions. I will fill the void in the current literature by providing a comprehensive understanding of the factors affecting acceptance and continuous use of mobile-based learning in accounting education. Theoretically, my contribution will also further corroborate the validity of the jointed ECM and UTAUT framework, adding to the already existing body of literature using it as a theoretical lens to investigate the relationship between expectations, satisfaction, and confirmation for the continued adoption of technological solutions in a plethora of contexts. The integrated framework consists of the following factors I will present in greater detail below.

Continuance Intention (CI)

CI as a construct is relatively self-explanatory, as it measures the intention of users, or in the context of my present research, accounting students, to continuously adopt game-based learning during their teaching activities (Reza et al., 2024). CI assumes that the use of a given technological solution, namely game-based mobile learning in my case, is ongoing and meant to continue over time. Originally, Venkatesh et al. (2003) integrated ECM and UTAUT to explore CI as a construct. Integrating the two models was crucial in capturing the desired effects, as the UTAUT cannot fully explain CI. The UTAUT focuses more on an initial experience than a prolonged use over time, which is essential to capture as it highlights a cognitive process that adds to that initial experience, leading to continued use over time.

Performance Expectancy

Performance Expectancy (PE) is a UTAUT construct, generally referred to as the degree to which an individual believes using a given tool will help them achieve better job outcomes (Alzaidi & Shehawy, 2022; Singh, 2020). In the context of mobile learning, PE addresses the perception of accounting students that using game-based mobile learning solutions will help them achieve better academic performance, which is essential for accounting students to choose to continue adopting mobile learning for their educational endeavors in the long run. Given the fact that previous research has found positive connections between PE and continued usage intentions in the context of mobile learning (Nawaz & Mohamed, 2020; Al-Emran et al., 2020), I have reasons to believe that if accounting students see game-based learning as an effective tool to learn, said belief will most likely influence their continuance intention to use gamification in their classes. Coherently with the above, I formulate the following hypothesis:

H1: Performance Expectancy significantly influences the usage behavior of students of game-based mobile learning solutions in the accounting classroom.

Facilitating Conditions

Theoretically, facilitating conditions (FC) pertain to the ability to access mobile learning and game-based solutions anywhere conveniently. FC is typically a UTAUT construct and addresses the need for external conditions to smoothen the adoption of a given technological solution, thus simultaneously

influencing its continued usage over time. Multiple studies have been conducted through the theoretical lenses of the UTAUT framework to demonstrate the presence of a connection between FC, namely a solid technological infrastructure or internet access, and the future usage behavior of a given technology. Having addressed the above and having found empirical evidence of the influence FC has on usage behavior (UB), I formulate the following hypothesis:

H2: Facilitating conditions significantly influences the usage behavior of students of game-based mobile learning solutions in the accounting classroom.

Confirmation

Theoretically, confirmation measures the degree to which an individual perceives the existence of a congruence between the expectations and the actual performance of a given tool or technology (Bhattacherjee, 2001). Confirmation is an ECM construct, suggesting that satisfaction is determined by the confirmation of users' expectations, as well their perceived usefulness of a given tool. In the context of technology adoption research, a user's expectations are confirmed by the continued usage of a tool or system, and generally get stronger in parallel with their performance expectations and overall satisfaction with the tools. I believe the same would apply to accounting students experimenting with game-based mobile learning solutions, and therefore I formulate the following hypothesis

H3: Confirmation is positively correlated to the use behavior and continuous usage intention of accounting students using game-based mobile learning solutions.

Communication tools quality

Being interconnected with teachers and peers, as to obtain and share information and feedback on a real-time basis is pivotal in modern higher education. As such, game-based mobile learning systems are deemed more effective when students have access to communication tools, and frequently use them to foster their communication skills and nurture strong connections with their class. Information technology is at the forefront of said process, as it provides the infrastructure for students to form the connections I mentioned previously. Drawing on existing empirical evidence, I can assume that the reliance on communication tools has a direct correlation with the usage behavior of ac-

counting students via the mediating role of satisfaction with game-based mobile learning. Therefore, I formulate the following hypothesis:

H4: Communication tool quality is positively correlated to the use behavior and continuous usage intention of accounting students using game-based mobile learning solutions.

Interface design

User interfaces are the point of contact between users and technology. As such, they are now crucial when designing an application or a software, as it is often considered the most important factor in making the user experience feel comfortable and engaging. Drawing on existing empirical data, I am inclined to hypothesize that the same would apply in the context of game-based mobile learning in accounting, as the user-friendliness of the application used is supposed to have a direct impact on the students continuous usage intention, through the mediating effect of the satisfaction with the system itself. Hence, I hypothesize the following.

H5: The interface design is positively correlated to the behavior of use and the intention of continuous usage of accounting students using game-based mobile learning solutions.

Satisfaction and usage behavior

Satisfaction is an ECM construct that heavily influences the intentions of users to keep using a given technological solution (Liao et al., 2009; Zhao & Bacao, 2020). In accounting education, I consider satisfaction the degree to which a student is happy with the use of a set game-based learning tool being provided. In other words, the satisfaction construct measures the contentment of the student with respect to his or her experience with game-based mobile learning systems. Additionally, usage behavior is an indicator of a student's acceptance of the game-based mobile learning experience they have had the chance to participate in. As a construct, usage behavior measures the degree to which an individual, in this case accounting students, is motivated to engage in a specific behavior and has shown to have a positive connection with satisfaction. Students with a strong perception of useful behavior are more likely to adopt game-based mobile learning solutions for the long run, as they would experience higher satisfaction levels when engaging with them. Even though scholarly research has most prominently focused on the perspective of customers when exploring said construct, finding it as a strong predictor of usage

behavior (Cao et al., 2018; Chen & Li, 2017; Zhou, 2013), I believe it would reasonable to apply the same logic to the accounting classrooms, as students play a similar role to the one played by customers making use of a product they were given. Hence, I formulate the following hypothesis:

H6 Satisfaction significantly influences the usage behavior of students to use game-based mobile learning systems of accounting students using game-based mobile learning solutions.

Usage behavior and continued usage intention

The usage behavior construct described above is derived from the UTAUT framework, and it has to do with the user's either negative or positive emotions when utilizing a given technology. Still, according to the UTAUT theoretical lenses, the construct of usage behavior acts as an effective predictor of the intention to continue using a technology over time. Given the plethora of studies pointing towards the existence of a connection between the two constructs, I hypothesize the following two hypotheses.

H7: Usage behavior positively affects the continued usage intention of game-based mobile learning systems of accounting students using game-based mobile learning solutions.

H8: Satisfaction positively affects the continued usage intention of game-based mobile learning systems of accounting students using game-based mobile learning solutions.

Having established the theoretical model for the empirical research, I collected survey data through Prolific. Even though several alternatives exist, including the famous Amazon's MTurk, Prolific has been successfully used in a plethora of empirical studies, thus making it an ideal choice for the research design I have chosen. One of the benefits of Prolific is its substantial degree of diversity in terms of the geographical distribution of the respondents, ensuring that a considerable amount of high-quality yet varied insights can be retrieved from the platform. Additionally, the platform's intuitive screening system allowed us to focus the scope of my research on accounting educators with teaching experience.

Screening questions were also added throughout the survey, in addition to the items needed for the testing of the model, as a means to refine the sample further and ensure the quality of the respondents was in line with the concep-

tual scope of the research. This way, I could filter out respondents studying subjects outside of the scope of accounting and those who were not enrolled in any higher educational program. An attention check was also added and placed randomly in the questionnaire to ensure the respondents were paying close attention to the answers they were giving. Since the study involved higher education students, the quality of the responses was good, and very few (n=3) had to be excluded due to their failing to pass the attention check. Overall, a total of 167 responses were collected, which is in line with the sample size recommendations set by PLS-SEM research. Structural equation modeling is ideal when no assumptions are made, and low numbers of responses are collected, especially in exploratory research. Having removed those who failed the attention check (n=3) and those who failed to respond correctly to the screening questions (n=23), the final sample size totaled 141 individual answers.

The items were built on a six-point Likert scale to minimize the risk of central bias. Answers ranged from 1, "completely disagree," to 6, "completely agree." In addition to one question for each item featured in the model, the attention check and two screening questions were included at the beginning of the survey. Demographic information about the respondents, including gender and nationality, was extracted directly from Prolific and reviewed in Microsoft Excel.

Items were derived from previous research and further refined by performing a smaller-scale experiment on a group of 12 accounting teachers working at my local university. Their insights were pivotal in helping me refine the questionnaire and ensure maximum clarity of how each question was formulated. I later performed PLS-SEM using the SmartPLS tool, a commonly used solution in quantitative research.

3.3.2. *Results: Insights from accounting students on the willingness to continue adopting game-based learning in the accounting classroom*

Before delving into the results of the PLS-SEM model, a few initial tests had to be conducted for validation. The first test consisted of ascertaining the internal reliability of the sample by examining Cronbach's Alpha and the composite reliability of the model. Given the 0.70 threshold set by previous PLS-SEM research, I can consider the results acceptable regarding internal reliability. Similar conclusions can be drawn when looking at the average variance extracted (AVE), whose scores all surpass the threshold of 0.5. Overall, the model can be deemed acceptable in terms of goodness of fit measures.

Table 3.1. – *Goodness of Fit measures*

	Cronbach's alpha	*Composite reliability (rho_a)*	*Composite reliability (rho_c)*	*Average variance extracted (AVE)*
CI	0.879	0.881	0.943	0.892
CONF	0.863	0.867	0.901	0.645
CTQ	0.776	0.806	0.844	0.522
DES	0.729	0.789	0.821	0.535
FC	0.741	0.860	0.779	0.525
PE	0.818	0.839	0.880	0.648
SAT	0.890	0.895	0.924	0.751
USA	0.751	0.766	0.859	0.672

A further measurement to validate the model is represented by discriminating validity, which was obtained by looking at the Heterotrait-monotrait (HTMT) ratio featured in the table below. Given the values are all below the threshold of 0.9, the discriminant validity of the model can be deemed satisfactory and, thus, acceptable.

Table 3.2. – *Heterotrait-monotrait (HTMT) ratio*

	Heterotrait-monotrait ratio (HTMT)
CONF ⇔ CI	0.747
CTQ ⇔ CI	0.455
CTQ ⇔ CONF	0.581
DES ⇔ CI	0.441
DES ⇔ CONF	0.486
DES ⇔ CTQ	0.621
FC ⇔ CI	0.359
FC ⇔ CONF	0.557
FC ⇔ CTQ	0.687
FC ⇔ DES	0.571
PE ⇔ CI	0.729
PE ⇔ CONF	0.832
PE ⇔ CTQ	0.633
PE ⇔ DES	0.617

Segue

PE ⇔ FC	0.524
SAT ⇔ CI	0.822
SAT ⇔ CONF	0.845
SAT ⇔ CTQ	0.595
SAT ⇔ DES	0.474
SAT ⇔ FC	0.538
SAT ⇔ PE	0.881
USA ⇔ CI	0.777
USA ⇔ CONF	0.732
USA ⇔ CTQ	0.372
USA ⇔ DES	0.484
USA ⇔ FC	0.517
USA ⇔ PE	0.763
USA ⇔ SAT	0.820

Additional tests were performed to verify the presence or absence of collinearity. The values are all significantly below the threshold of 5, thus once again acceptable. Variance Inflation Factor (VIF) values are provided in a table below.

Table 3.3. – *Multicollinearity tests*

	VIF
CONF ⇨ SAT	1.411
CTQ ⇨ SAT	1.523
DES ⇨ SAT	1.429
FC ⇨ USA	1.447
PE - ⇨ USA	2.301
SAT ⇨ CI	1.837
SAT ⇨ USA	2.510
USA ⇨ CI	1.837

A few additional tests were run for the sake of accuracy and are presented in the table below. The root mean square residual (RMSR) is the difference between the observed correlation and the model implied correlation matrix, and values of less than 0.1 are acceptable. In regards to the Normal Fit Index (NIF), values should range between 0 and 1, yet the closer they are to 1 the better. Overall, I am satisfied with the results and believe I can proceed further by describing the results of the PLS-SEM modeling.

Table 3.4. – *Additional model fit tests*

	Saturated model	*Estimated model*
SRMR	0.087	0.089
d_ULS	3.967	4.141
d_G	1.730	1.750
Chi-square	992.627	996.513
NFI	0.630	0.628

PLS-SEM Model Results

Having formalized the model fit tests and ascertained the validity of the model, I proceed further to explain the results of the PLS-SEM.

Figure 3.2. – *PLS-SEM model*

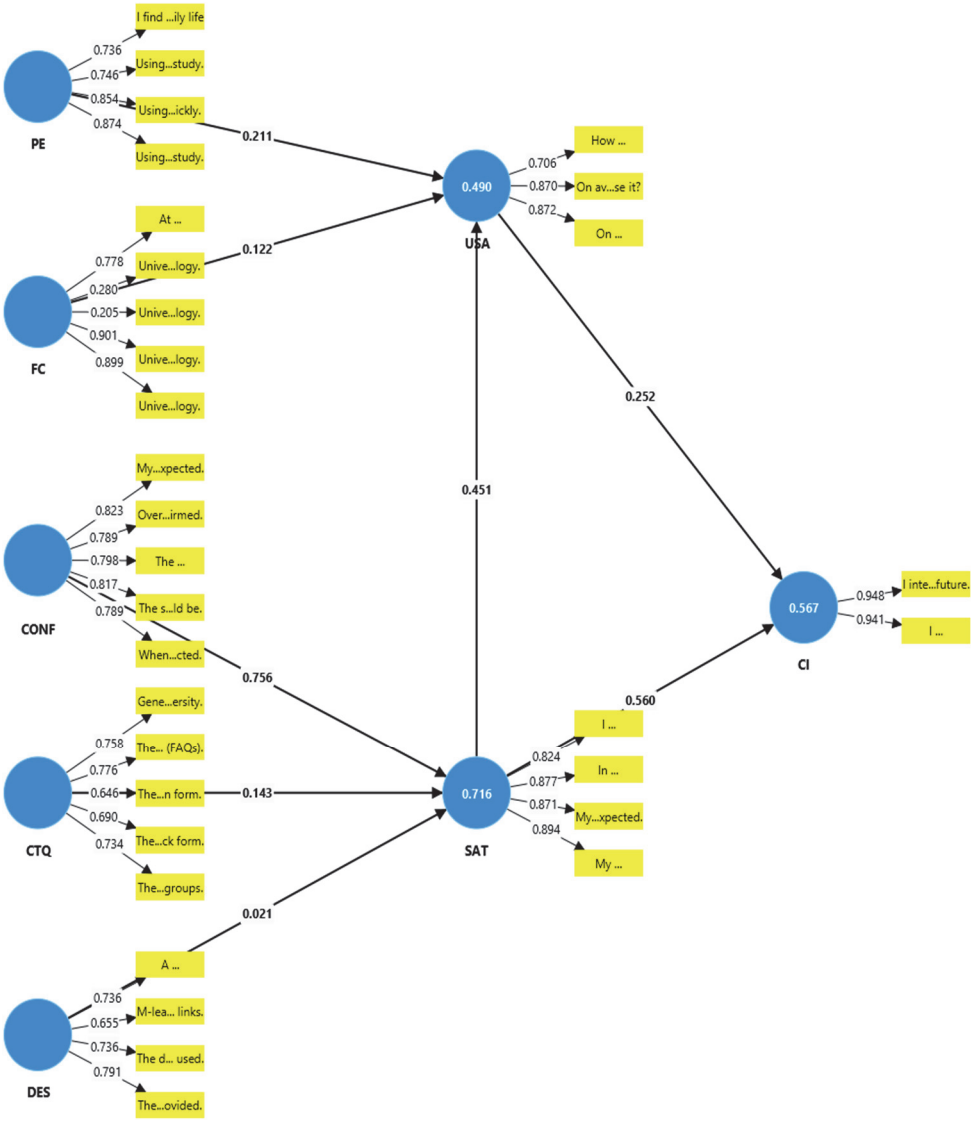


Table 3.5. – *Path Coefficients and P-Values*

		B	*Std*	*T-value*	*P-values*
H1	PE ⇨ USA	0.211	0.127	3.665	0.000
H2	FC ⇨ USA	0.122	0.097	1.268	0.205
H3	CONF ⇨ SAT	0.756	0.058	13.066	0.000
H4	CTQ ⇨ SAT	0.143	0.065	2.207	0.027
H5	DES ⇨ SAT	0.021	0.063	0.328	0.743
H6	SAT ⇨ USA	0.451	0.139	3.241	0.027
H7	USA ⇨ CI	0.252	0.084	3.021	0.000
H8	SAT ⇨ CI	0.560	0.092	6.075	0.000

With the present study, the goal was to explore the perspectives of accounting students in regards to the continuous usage of game-based mobile learning solutions in their classes. More specifically, the goal was to identify the factors that most effectively impact the deployment of said solutions. In line with previous research, PE was found to be a significant predictor of USA, indicating that the way students perceive the effectiveness of game-based solutions greatly affected their actual usage behavior. I have, therefore, accepted H1, having found the statistical significance of the connection between the two. In contrast with existing theories and empirical data, however, I was not able to find a statistically significant correlation between FC and USA. Despite having to reject H2, the result is indicative of a certain lack of infrastructural support perceived by the respondents. In fact, two items of the FC factor failed to load properly, namely "Universities have concerns regarding my information security when I use game-based mobile learning technology." and "Universities have concerns regarding my privacy when I use game-based mobile learning technology". Given the significantly low mean for the two items mentioned above, a conclusion I can draw is that institutions could work on both aspects, as to provide better support to students intent on using game-based mobile learning technologies. Furthermore, in line with theory and previous research, I find CONF to be a statistically significant predictor of SAT. The same applies to CTQ, but not to DES, which was found to be not statistically significant. Furthermore, the PLS analysis revealed that SAT to be a statisti-

cally significant predictor of USA, and both USA and SAT effectively predict CI with a statistically significant correlation.

Results are somewhat in line with UTAUT2 research, which assumes that PE is a pivotal factor when it comes to the adoption of a given technological solution. PE being an essential predictor of the USA is in line with previous research, and is useful to provide recommendations for universities to enhance the learning process of students through the use of game-based mobile learning solutions. Interestingly enough, FC was not found to be a statistically significant factor in the adoption and continued use of game-based mobile learning. However, plenty of existing research seems to suggest that FC is a crucial factor in online education and, more broadly, in technology adoption amid accounting classrooms. Thus, further research efforts could address the above. CONF is among the strongest predictors of SAT, thus suggesting that a widespread adoption and appropriate use of game-based mobile learning solutions has a degree of impact on the students' decision to adopt said technology. Still, both USA and SAT being statistically significant and strong predictors of CI is an important takeaway. Even though I was not able to find technological support and infrastructures as a strong predictor of users' satisfaction with game-based mobile learning solutions, the results align at least partially with extant research and find the CTQ, PE, and CONF to be predictors of USA and SAT. Moreover, I find both USA and SAT to be predictors of CI.

3.3.3. *Implications of the study*

Theoretically, my research fills in a notable gap highlighted by Silva et al. (2021), who noted the need for empirical accounting education research to explore the perspectives of educators, and find what factors play a role in the decision to continue to adopt game-based solutions over time. The use of a ECM and UTAUT integrated model was thus deemed the ideal choice in research design (Su & Tong, 2021; Teng et al., 2023), as it allowed me to explore the impact several factors had on the CI of accounting educators when it comes to game-based learning solutions. In doing so I answer several calls for research found among gamification literature that have yet to be addressed. For instance, James et al. (2024) called for further research endeavors to explore other students' engagement models and provide further empirical evidence. Similarly, in their review published in 2016, Carenys and Moya (2016) called for the development and testing of factors that foster or limit the adoption of game-based learning solutions, which is at the core of my analysis. Overall, the results show how the main enabling factor for continued adoption of game-based mobile learning solutions by accounting students is PE. When

students believe the tools are effective in driving across the desired educational outcomes, they are more likely to continue to adopt them, irrespective of the efforts required to use them. Constructs such as SAT and USA are also influencing CI, suggesting that investing in effective communication infrastructures for students to interact with teachers at any moment, is key in stimulating the continuous use of game-based mobile learning solutions.

The above results answer a few calls for research, thus providing significant implications and contributions to the field of gamification in accounting education. Answering the call for James et al. (2024), for instance, I find that the perceived effectiveness of a game-based learning solution has a more significant impact on its continued use than the design, and how captivating a platform is for students. A recommendation for scholars and accounting faculty would be to focus future efforts into striking an ideal balance between the effectiveness of game-based mobile learning solutions (Jordan & Samuels, 2020), and the convenience of their use, as a way to further stimulate engagement over time. Future efforts could also further expand upon the model and investigate the effects of factors such as the existence, or lack thereof, of institutional support and facilities meant to smoothen the adoption of game-based learning solutions. Similarly, the ECM construct of trust could be integrated into the model, and used to explore the degree to which accounting educators believe game-based learning solutions to be reliable in their outcomes.

3.4. Profiling the future research directions of Accounting Education: Accounting Education and Gamification

Several pathways for future research can be drawn when looking at the stream of game-based learning in accounting education. First, even though I considered technology and gamification as separate entities throughout the book for the sake of clarity, technological advancements will undeniably affect the evolution of game-based learning in accounting education and open up new opportunities for educators worldwide. For instance, the rapid growth of video games and their immense popularity with younger generations are a testament to the limitless possibilities when it comes to gamification in accounting. Similarly to what I have stated in the section above, longitudinal studies focusing on ample datasets could be an interesting development for the field, as they could assess the long term effectiveness of game-based solutions not only in terms of the students' learning experience but also their educational outcomes, measured in their workplace.

4.
Update of Accounting Education Curricula

As the competitive market continues to evolve rapidly and companies become increasingly sensitive to sustainability concerns—ranging from climate change mitigation to environmental impacts—there is a critical need for accounting education to ensure newly graduated students remain aligned with global developments. Alongside sustainability, the advent of disruptive, innovative technologies has significantly reshaped the accounting profession, introducing new skill sets and core competencies essential for modern accountants. While scholars widely acknowledge the importance of aligning accounting education with the demands of the modern workplace, research reveals a substantial gap between industry needs and academic offerings, as accounting curricula struggle to match the relentless pace of global advancements. This chapter delves into the discrepancy described above, shedding light on the current state of scientific exploration regarding updates to accounting curricula in higher education institutions worldwide. In addition to offering a critical overview of the field, I present a case study of a master's degree program at the University of Turin, designed specifically to bridge the gap between academia and industry by focusing on key ESG competencies.

4.1. Insights from the LDA topic modeling: the need for Accounting educators to rethink the curricula of accounting courses

In previous chapters, we discussed how technological advancements have enabled educators to rethink the delivery of accounting classes, partly in response to the lockdowns triggered by the COVID-19 pandemic, which inadvertently accelerated the digital transformation of higher education. However, technology's influence extends far beyond how students learn accounting during their academic years; it will be a defining feature of their professional futures. This is why an increasing number of scholars advocate for incorporating

technology-focused insights into accounting courses. A key driver of this shift is the belief that mastering technologies such as artificial intelligence (AI) or big data will enable future accountants to advance their careers significantly faster than peers who lack such expertise.

Tim Ryan, PwC US senior partner, and Jeff Thompson, CEO of the Institute of Management Accountants, highlight a pressing skills gap between the digital competencies provided in education and the demands of the professional marketplace. This divide represents both a challenge for companies, which struggle to find accountants with the necessary skill sets, and an opportunity for students to maximize their potential and distinguish themselves in a competitive job market. The motivation to excel in the job market should not be underestimated, as accounting has historically attracted students seeking strong career prospects. Currently, big data analytics is often regarded as the next frontier for accountants, and mastery of this skill could significantly differentiate them from their competitors.

Similarly, AI has introduced disruptive changes to the accounting profession, reshaping it in response to technological innovations (Holmes & Douglass, 2022). For instance, AI is frequently used to process large volumes of textual data in areas such as tax and auditing, as well as in reviewing legal agreements. The intersection of accounting and AI is poised to grow, yet scholars express concerns about the ability of accounting programs to keep pace with this rapidly changing environment. Despite evidence showing that proficiency in AI applications enhances productivity, workplace confidence, and accelerates career progression, the integration of AI into accounting curricula remains markedly insufficient.

Qasim et al. (2022) suggest that resolving this impasse may require the involvement of accounting professionals in the redesign of state-of-the-art accounting curricula that align more closely with workplace expectations. Such collaboration between industry and academia could be pivotal in preparing future accountants to navigate the challenges posed by information technology and AI specifically. As Awayiga et al. (2010) noted, concerted efforts from both sectors are crucial to ensuring that accounting graduates are equipped to thrive in the evolving technological landscape.

4.2. Updating Accounting curricula amid current job market expectations

4.2.1. *Technology, Blockchain and Artificial Intelligence in Accounting curricula*

As a new generation of digital natives rises, the need for accounting education to expand upon the technical knowledge, and include digital technologies as a core competency of accounting graduates has been established in the literature (Al-Htaybat et al., 2018). For instance, a few contributions have explored the integration of blockchain technology in accounting education, most notably due to its rampant proliferation and adoption in the professional landscape (Liao et al., 2025; Oraby, 2025). As such, accounting professionals expect future graduates to possess technology-specific skills, and to be able to master blockchain technology. In accounting, blockchain technology is currently used in a variety of situations (Qasim & Kharbat, 2020), as it aids in the standardization of financial data formats, it allows for real-time auditing based on real-time data, and also facilitates reporting practices (Hakami et al., 2023; Rijanto, 2024). Yet, despite a surface level interest towards the technology in question, with both academia and industry seemingly agreeing on its potential for the accounting profession, a very limited number of studies have been conducted to explore its integration into accounting curricula. The few attempts at exploring the integration of blockchain technology in accounting curricula will be discussed below.

AI literacy is now becoming more and more pivotal in accounting education, due to its rapid proliferation in the financial and accounting sectors. As posed by Tuomi et al. (2018), AI allows students to be better equipped in adapting to new technologies and methods in the workplace, thus anticipating future changes to the competitive environment. Being versatile about AI, allows accounting students to perform effectively in the market and gain a competitive advantage on their peers (Cunha et al., 2022; El Hajj & Hammoud, 2023). The need for accounting education to embed AI has been echoed in several works, not merely for its usefulness in regards to daily homework assignments, but also for its broader applicability to analysis and decision making. Similarly to what has been established for technological literacy at large, being proficient with AI allows future accountants to access the job market with a critical competitive advantage of their competitors, thus improving their chances of landing a dream job, or a faster career progression.

Having ascertained the importance of AI literacy in the modern workplace, the efforts made to renovate traditional accounting curricula appear insuffi-

cient at the present time (Peng et al., 2023; Sina, 2023). Said gap in the literature has sparked my interest in conducting the case study that follows, as specific calls for research exploring awareness, interest, and implementation of updated accounting curricula have been made (Cong et al., 2018; Giuggioli & Pellegrini, 2022). In other words, the accounting academia worldwide is seemingly lagging behind the, admittedly, fast pace at which the workplace is evolving. Ensuring accounting students are literate in AI is not a mere case of career advancement, either. In fact, as ethical concerns regarding the use of AI continue to rise, it is up to accounting educators to help students draw the line between the human factor and the use of the technology as a tool to enhance their decision making capabilities. Such an evolution of accounting curricula would allow students to not only be proficient with its use, but also to ensure a consistent level of integrity when doing so.

Al-Hattami (2024), Fathema et al. (2015), and Teo (2011) are all favorable towards the adoption of technology in accounting education. Yet, they all stress the importance of educators in such implementation. In other words, when faculty members perceive a given technology as relevant to the student's education, as well as easy to use, they better resonate with it and are more likely to integrate it into their curricula. Therefore, usability and user-friendly interfaces become critical in educational technology, as educators' attitudes towards the integration of blockchain in accounting education is affected by their perceived usefulness of the technology itself. In other words, those who view blockchain as beneficial for teaching accounting, are more likely to adopt it in their courses (Kaden et al., 2021).

Changes to accounting curricula, however, do not happen overnight (Xu et al., 2024). A plethora of factors, both internal and external affect their integration. What is established by scholars, is how the efforts from educators are not enough to warrant systematic changes to the system, as there is still a significant margin between what higher education institutions offer in terms of accounting education and what professionals expect from graduates. The widespread hope shown by accounting scholars is that, eventually, pressures from employers, in conjunction with increased levels of interest from students will inevitably lead to more structural changes, and a more in-depth integration of information technology in accounting education curricula (Cohen & Karatzimas, 2022). The perennial shortage of accounting graduates with strong professional readiness, along with the appeal of higher than average stipends are the sparks that might lit the fire mentioned earlier, and set the revolution into motion (Cardwell et al., 2019; Prescott et al., 2017).

Having reviewed the literature as a whole, I came to the conclusion that, aside from cultivating a culture promoting analytics-oriented research in ac-

counting, more concerted efforts from academia and industry are required to bridge the gap between employers' expectations and higher education curricula. As I will discuss later in the case study I present, which I believe acts as a strong reference to solve the academia-industry divide, when educators and practitioners join forces and keep a close tab on what students desire out of their professional future, the creation of job-ready accounting curricula becomes much easier.

4.2.2. *ESG in Accounting Education in Accounting curricula*

As digital transformation has been a main driver for change throughout the past decade, the future of the accounting profession will be dictated by the importance of ESG performance and, more specifically, the need for companies to hire accounting professionals that are able to understand and measure the ESG impact of the company their work for. In brief, ESG stands for environmental, social, and governance. It is meant to be a holistic framework measuring how sustainable a business is, with the intent of providing stakeholders and potential investors with a set of metrics which can be of interest when it comes to evaluating their social responsibility. In fact, ESG is conceptually adjacent to terms such as corporate social responsibility or sustainability, albeit it covers a much wider, comprehensive spectrum of sustainability oriented practices. It is worth nothing, however, that ESG has not only reshaped business models as we know them, but also the entire accounting domain, including reporting, financial and managerial accounting, as well as tax and auditing (Butcher, 2022). Almost every aspect of a company's daily operations have been profoundly impacted by the introduction of the ESG framework, as well as the rapid change in stakeholders' expectations and demands when it comes to sustainability and reporting. Coherently with the above, it comes as no surprise that accounting professionals are now even more so expecting graduates to possess a strong knowledge of ESG. Moreover, while only a few companies adopted ESG reporting originally, the standards have quickly become a pillar of modern day reporting practices, with 95% of Standard & Poor's (S&P) 500 companies presenting an ESG report, as of 2020. As I mentioned before, the trend is at least partially justified by the growing levels of awareness and interest in sustainability reporting shown by stakeholders. However, it is also worth noting that ESG provides companies with a plethora of benefits and opportunities to rethink their business practices, and improve their performance.

Against the background depicted in the two paragraphs above, it comes with no surprise how companies are actively seeking accounting students with ESG awareness, willing to be their ESG advisors and experts (Butcher, 2022).

Yet, academia is still significantly lagging behind the needs of the accounting professionals. In fact, research shows a disconnect between accounting students and ESG, indicating that even though they are familiar with the conceptual scope of ESG, they struggle to understand the connection between ESG and accounting (Pippin et al., 2021). There is a curious gap between students and academia, as even though there is a profound interest from the younger generations in sustainability, environmental and social issues, very few institutions have currently included a ESG specific curriculum in their accounting programs. A recent study by Hadi and Abdel-Razzaq (2024) further corroborated the above, noting a deficiency in sustainability in accounting education curricula, further widening the gap between students and practitioners when it comes to ESG in accounting. Similarly, Simmons et al. (2024) attempt to shed light on the matter, in an attempt to understand the degree to which ESG is being integrated into the accounting curriculum of higher education institutions worldwide. Their results are interesting, as they show how ESG in accounting is taught primarily through the own initiative of educators, with limited formal integration of ESG in the graduate curriculum by the faculties. Additionally, the responses to their survey indicate a general lack of awareness of the importance of ESG integration in accounting education curricula, further exacerbating the concerns echoed in previous studies. Said concerns regarding the somewhat outdated state of accounting education and its inability to keep up with the demands of the modern marketplace are certainly a core topic of discussion for a recent, yet rapidly developing stream of research. As more and more companies drift towards integrated reporting, sustainability reporting, ESG reporting, and more, I believe it would be necessary to both assess the expectations of students, and determine how much importance they give to learning these facets of accounting, and consequently consider an extensive update of accounting curricula in accordance with the concerns aired by accounting education scholars.

4.2.3. *Sustainability in Accounting Education in Accounting curricula*

Along with the focus on ESG, sustainability and climate change are progressively becoming more intertwined with scholarly accounting research. As societal expectations continue to rise, resulting in stakeholders becoming more aware and interconnected than ever before, the accounting profession has seen the rise of sustainability-oriented practices, namely risk assessments and sustainability reporting, to name a few. As companies are now held accountable by global standards and are thus required to disclose their strategies to mitigate the risks connected to climate change (IFRS, 2023), there is a significant

urgency in employers looking for accounting graduates that are not only more sensitive and aware of environmental-related accounting practices but are also showing a significant degree of competence in said practices.

As opposed to the integration of ESG in accounting education, climate change and sustainability are featured in a much more prominent fashion, among accounting curricula worldwide. However, despite the more significant degree of popularity sustainability topics possess when it comes to accounting curricula, some concerns remain. Most notably, scholars noted how the teaching of sustainability in accounting education is, for the most part, based on its theoretical aspects, rather than the practical ones. As such, a concerning divide between academia and industry is arising, as recently graduated and newly appointed accountants often lack practical competencies when it comes to sustainability reporting. Consequently, the ongoing debate is still rather lively, as accounting education scholars share their insights, strategies, and suggestions on how to better integrate sustainability into accounting curricula, and foster not only the students' theoretical knowledge, but the practical competence as well.

4.2.4. *Leadership, Critical Thinking and Soft Skills in Accounting curricula*

Even though there have been some conflicting views on whether or not professional soft skills have a place in accounting education, Stoner and Milner (2010) believe they are more than a 'necessary evil' and rather a core component of a successful accounting education experience. Confidence, decision making, and handling of information are more than mere skills to list on a CV, and instead actively contribute to the intellectual development of an accounting student. As such, in parallel to the development of information technology skills, scholars have stressed the importance of analytical and critical thinking to go along with more technical competencies (Al-Htaybat et al., 2018). Their development is far from trivial, however. As posed by Jones (2010), generic attributes and soft skills are not transdisciplinary, instead they are radically tied to the discipline they are taught in. In the case of accounting education, generic competencies are therefore different from the ones nurtured in other disciplines, and are directly tied to the expectations of employers and professional accountants.

The rather practical nature of accounting has historically stimulated educators to foster students' critical thinking and soft skills, in addition to the more technical competencies tied to the subject itself. Similarly to what has been said earlier regarding sustainability and ESG, the development of more professionally oriented skills in accounting students is often driven by the de-

mands, or expectations, of future employers. In other words, accounting educators often take into consideration what might be expected from graduates by their future employers. Even though there is not a universal consensus on whether accounting curricula should be primarily driven by employers' expectations (Hopper, 2013), it is undeniable that accounting classrooms stimulate peer interactions and critical thinking more than other subjects' classrooms. Group Work, team projects, and presentations are often core components of accounting grades, as they are meant to develop students' critical thinking and team working abilities, both critical in the workplace (Sawan et al., 2024).

Additionally, given the fact a significant portion of accounting students chose said path for the sake of achieving better career prospects, it comes as no surprise that scholars would focus their efforts in figuring out how accounting curricula could foster more than mere technical skills, and instead develop all around accountants, ready to tackle the challenges brought about by the workplace (Baird & Parayitam, 2019). In fact, said integration of both technical and social competencies is not merely driven by market demands, but also by students themselves. In fact, accounting students often value the acquisition of generic skills to go along with more technical, core accounting competencies. More precisely, Webb and Chaffer (2016) noted how students positively value the development of soft skills, such as time management and problem-solving during accounting classes. However, some critical gaps still remain open despite decades of research. For instance, the proposal made by Montano et al. (2001) of exploring the involvement of practitioners in the curricular innovation of accounting subjects remain partially unanswered to this day, and contributed to my idea of presenting the contribution I will feature below.

4.3. Empirical Case Study: University of Turin, D-ESG Master

To address the numerous calls for research advocating empirical case studies that examine the integration of sustainability and technology in accounting curricula (Apostolou et al., 2016; Sledgianowski et al., 2017), I have conducted an interpretative case study based on the recently introduced D-ESG master's program at the University of Turin (Strauss & Corbin, 1990). This case study aims to respond to these calls and provide essential empirical evidence on how pioneering institutions are incorporating sustainability and digital technologies into their accounting curricula.

Several additional gaps identified through my review further justify the

case study discussed in the sections below. First, as Al-Htaybat et al. (2018) suggested, accounting research must address the needs of the new generation of accountants by exploring the perspectives of academics, students, and employers on designing modern and engaging accounting curricula that meet current and future job market demands. Second, this case study builds on the research direction originally proposed by Jones (2010), who emphasized the need for accounting scholars to investigate the unique aspects of accounting education and produce scholarship tailored specifically to it. Given the scarcity of studies examining the joint integration of digital technology and ESG in accounting curricula, I believe this case study offers a unique and well-justified contribution.

To provide an initial, exploratory response to the gaps mentioned above, I believe a qualitative case study research design is the ideal approach. Specifically, the case study of the D-ESG master's degree offered by the University of Turin aligns well with the research design due to its pioneering nature and distinctiveness within the landscape of accounting education. The program aims to equip graduates from diverse backgrounds, including business and accounting, with a broad set of competencies enabling them to assess the ESG performance of companies amidst the disruptive digital innovation and transformative changes brought about by digital technologies. As one of the first degrees to focus on ESG performance, it has attracted significant interest from both students and employers. The student body, both local and international, primarily comprises individuals with business-adjacent backgrounds but also includes those from engineering, law, and broader social science disciplines.

The master's degree emerged from a forward-thinking vision, driven by the current shortage of professionals capable of effectively monitoring, evaluating, and auditing the ESG performance and impact of companies. Having thoroughly outlined the theoretical framework of the case study, as accounting education scholars consider how best to update current accounting curricula to reflect evolving expectations from students and employers, this program represents a crucial first step in bridging the gap between industry and academia while offering a contemporary approach to educating future accountants and business consultants.

4.3.1. *The Case Study Methodology*

A case study is generally built on a specific, in-depth inquiry into a complex phenomenon and draws data from a setting that possesses a certain degree of uniqueness. In the context of the research I have conducted, I firmly

believe that a case study represents the ideal methodological approach to addressing the gaps identified above. More specifically, the intent is to thoroughly explore a pioneering curriculum of accounting education and to understand its intricacies from a wide range of perspectives, including those of students, educators, and practitioners who are interested in employing the program's graduates. Two main reasons guided the choice of a case study. First, the core aim of a case study is to deeply understand and accurately describe a given phenomenon. In my research, the phenomenon under investigation is the update of accounting curricula, which I believe to be sufficiently intricate and multifaceted to justify a case study approach for comprehensive understanding (Eisenhardt, 1989). Second, the goal is to explore not only what drives educators to advocate for updated accounting curricula but also the motivations that lead students to pursue such paths, as well as the interests of stakeholders and future employers in the graduates' skill sets.

While a plethora of case study research approaches have been documented, my research adopts an interpretive case study methodology, which I find to be the most fitting for the specific research design. Interpretive case studies enable researchers to uncover the meanings attached to a phenomenon while considering the broader contextual factors in which it occurs (Orlikowski & Baroudi, 1991).

Data was collected from multiple sources, including my participant observation of classes. A total of 21 distinct individuals were involved in the interview procedures: 8 members of the scientific committee, 4 teachers, 4 tutors, and 5 practitioners. Data saturation was achieved (Fusch & Ness, 2015), as no new information emerged beyond the 29th interview I conducted. Consequently, I deemed the data sufficient to proceed with the coding process and carried out the analysis accordingly. The data collection spanned seven months, from January 2024 to August 2024, during which my active involvement in the definition and launch of the master's program allowed me to directly observe its inception and early implementation.

Material was drawn from a variety of sources. Primary data included both interviews and my active classroom observations, while secondary data consisted of teaching materials, introductory presentations, and internal documents (Miles & Huberman, 1994). The interviews were semi-structured and included open-ended questions designed to explore the key themes identified earlier in the review. These themes encompassed the factors driving a reevaluation of core accounting subjects, the vision for the future of the profession, and the most effective measures to address the current shortage of job-ready accountants. All interviews were transcribed verbatim, with each session averaging approximately 60 minutes in length.

I adhered to the principles of theoretical sampling outlined by Eisenhardt (1989) and ensured that participants represented all involved groups, including students, stakeholders, and educators. For sampling, I employed a combination of snowball sampling and convenience sampling. This approach allowed me to contact participants directly as the master's program progressed. Additionally, data triangulation was implemented by incorporating supplementary materials such as teaching and promotional resources associated with the program's launch. Triangulating data is a critical practice in qualitative research, as it ensures the validation of findings by cross-verifying information from multiple sources, which often reflect diverse perspectives and opinions on the subject being studied.

The interviews were conducted with an open-ended format to encourage in-depth responses, with durations varying between 30 minutes and one hour. Teachers and members of the scientific committee were asked about the rationale behind the program's implementation and their expectations for the future of the accounting profession. Practitioners, on the other hand, were prompted to elaborate on their interest in hiring the program's graduates, including the specific skills they deemed essential for success in the industry.

I carried out the interviews until theoretical saturation was achieved, continuously assessing, interpreting, and reviewing the material as it was collected. Saturation was reached when no new themes or insights emerged from the data. At this point, I concluded that additional interviews were unnecessary and ceased further data collection. I then shifted my focus toward analyzing and synthesizing the information to extract meaningful insights.

4.3.2. *Results: Insights from D-ESG Master-level Accounting educators on the need for academia to rethink the curricula of accounting courses*

Having had the opportunity to frequently engage with both students and educators involved in the master's program, I gained valuable insights into the intrinsic motivations that led students to select it as their academic path, as well as a deep understanding of the vision behind the decisions made by the scientific committee responsible for designing and bringing the master's to life. I was able to attend each student's screening interview, where I asked targeted questions to explore what drives them to pursue the master's degree and their aspirations to become experts in evaluating ESG performance and impact. Additionally, I had the privilege of regularly interacting with the scientific committee, allowing me to pose numerous questions about their vision for the program, their perspectives on the market's expectations for accounting

graduates, and their outlook on the future evolution of the field from both professional and academic perspectives.

Regarding the vision behind the conceptualization of the D-ESG master's program, the prevailing opinion I gathered from its teachers and the partnered companies is a shared belief that ESG represents the next significant challenge for companies worldwide, akin to the transformative impact of digital innovation over the past decade. With sustainability reporting and disclosure standards rapidly becoming the norm, there is a pressing need for academia to ensure that accounting graduates are not only well-versed in the principles of ESG impact but also equipped to accurately measure and thoroughly understand it.

> *"The time for companies to digitize themselves is over. Those who did survived COVID-19, those who did not, died. ESG will be next great challenge for years to come, and companies will require specific know-how to handle it properly"*

Additionally, the accountant shortage highlighted in several prior articles also emerged as a recurring theme during the interviews and was identified as one of the primary factors driving the development of the master's program by all parties involved. Many students viewed the program as an opportunity to delve into subjects they are genuinely passionate about while simultaneously acquiring a set of specialized competencies that would position them as highly sought-after and well-compensated professionals in the future. Similar sentiments were echoed by the practitioners collaborating with the program, who emphasized the strong interest expressed by numerous companies in the region regarding the potential recruitment of the program's graduates.

> *"We are contributing to the development of a professional figure that has yet to be fully established, despite the rising need for companies to adhere to ESG standards, and learn how to measure and disclose their ESG impact. Therefore, I believe most if not all of the students have been hired well before the program is completed."*

Further corroboration on the above comes from students with backgrounds other than accounting, wanting to pursue the D-ESG master's degree for the sake of obtaining a professional edge over their future competitors in the job market. Similarly, the educators involved in developing and conceptualizing the curriculum, also share the sentiment, and believe the profession to be highly requested for the future. The professional figure that the Master's program

aims to develop is for a new role increasingly sought after by companies, institutions, and legislators: a professional who integrates the current skills of a Sustainability Manager, a CSR Manager, and a Diversity Manager, to take on a comprehensive impact management role. Such a comprehensive figure should not only be driven by the desire of achieving a better professional position, with a satisfactory salary. Instead, it should be driven by an uncommon passion and desire for the three ESG pillars, and the willingness to have a positive impact on society at large.

> *"In order to truly succeed in this profession, I believe students must be more sensible than the average when it comes to sustainability and social responsibility. Without a strong passion for these subjects and the belief that the actions of every individual could significantly impact society, then I do not believe they will be successful in their attempt. Thus far, I believe every student we accepted into the program to have in innate belief that they can bring change to the world."*

The above sentiment can be traced back to a general decrease in interest shown to more traditional accounting graduate programs, with the numbers of students enrolled each year dramatically reducing in favor of adjacent business disciplines. Leveraging the passion new generations have towards sustainability and climate change could foster the comeback of accounting as a major destination for graduate and undergraduate students.

> *"Even though the students' satisfaction with our courses remain significantly high, I cannot help but notice a countrywide trend that sees accounting losing some of its fashion, thus leading to a decrease of students being enrolled on a yearly basis. Modern programs such as the D-ESG master's can be a solution to address the trend, which is not limited to Italy, but to the world as a whole, from my understanding."*

4.3.3. *Implications of the Case Study*

The expectations gap between accounting graduates and employers is nothing new (Wells et al., 2009); instead, it has been a central topic of scientific debate for decades. While the typical response to this issue has been a stronger emphasis on developing professional capabilities and skills, the case study I present takes a different approach, showcasing a success story of a master's degree designed in collaboration with practitioners and ESG professionals. In doing so, I address calls for research to explore the integration of ESG into ac-

counting curricula (Khosa et al., 2024; Othman & Ameer, 2024). Several practical and theoretical implications arise from the case study of the D-ESG master's program at the University of Turin. From a methodological perspective, I respond to the call made by Theuri et al. (2024) by providing empirical evidence from a case study to complement the vast descriptive literature already present in the field. I also respond to O'Hara et al. (2024) by presenting empirical evidence on how accounting curricula can be redesigned to reflect changes in the professional landscape. The case study emphasizes the importance of involving practitioners and employers with a clear vision of the graduate profile they seek, alongside educators willing to reflect and modernize their core offerings. Complementing earlier works such as Khosa et al. (2024), this case study investigates the factors influencing the integration of climate-related sustainability into accounting curricula. Based on the evidence I gathered, a pioneering vision among educators, combined with active efforts in sustainability research and an awareness of modern accounting needs, has been pivotal to the master's development.

From a technical standpoint, Simmons et al. (2024) called for research to examine the integration of ESG into accounting curricula, assessing how and to what extent this implementation takes place. The case study presented here directly addresses this call, contributing to the limited body of research on ESG in accounting education. My findings indicate that case studies, academic articles, and lectures by practitioners currently represent the most viable methods for delivering ESG content within accounting programs. However, most of the teaching materials used are adapted from traditional courses and updated to include ESG references. This underscores a need for scholars to develop ESG-specific textbooks and tailored teaching materials, which would greatly enhance the learning experience for students and ease the burden on educators. Currently, educators depend heavily on practitioner reports, industry documents, or revised materials from prior courses, rather than purpose-built resources.

From a theoretical perspective, this case study serves as a leading example of how accounting curricula can be modernized and tailored to fit the evolving professional landscape without requiring excessive or radical changes. While core accounting technical skills remain the centerpiece of most courses, the master's degree featured in this study offers valuable insights and actionable recommendations on effectively updating the accounting discipline. By addressing calls from Sharma & Stewart (2022) for qualitative, case-based research, I provide evidence of successful integrations of sustainability and technology into accounting education, which also responds to calls from other scholars (e.g., Sledgianowski et al., 2017; Apostolou et al., 2015). Practition-

ers who partnered with the master's program were instrumental in ensuring its alignment with market needs, offering internships and future career pathways for students. This partnership supports the call made by Othman and Ameer (2024) for qualitative research focusing on practitioners' perspectives to understand their expectations better. Moreover, interviews with students highlighted their passion for sustainability, climate change, and carbon accounting as crucial factors underpinning the program's success. Without such enthusiasm, educators would have faced significant challenges in stimulating interest and engagement.

From a practical perspective, this empirical case study provides insights relevant to both academia and industry. It highlights the ongoing shortage of accounting professionals, a trend that is expected to worsen in the future (Karlsson & Noela, 2022). The findings partially address this issue by demonstrating how presenting a modernized version of traditional accounting content can attract new students. The shortage of accountants, previously discussed in multiple articles (Cardwell et al., 2019; Prescott et al., 2017), was a key factor driving the creation of the D-ESG master's program. This shortage sparked collaboration between the University of Turin and several small and medium-sized enterprises (SMEs) in the region. Both parties shared a mutual interest in preparing future accountants to tackle the challenges presented by the rapidly evolving professional landscape. Consequently, a comprehensive dialogue was established to ensure the curriculum would align with these needs, reflecting the market's current demands.

4.4. Profiling the future research directions of Accounting Education: Update of Accounting Education Curricula

An interesting line of future research, in my opinion, is the need for educators to not only update accounting curricula but also revise relevant definitions and course books currently adopted in higher education (Barber et al., 2014; Benn & Dunphy, 2009). As I have demonstrated throughout this book, the revolution in accounting education is well underway; it is now up to accounting scholars to ensure that theoretical advancements keep pace with practical developments. To achieve this, future research must focus on these emerging trends and reimagine course books to offer a more contemporary perspective on established theoretical frameworks and conceptualizations (Vanini & Bochert, 2024).

However, several additional research directions emerge from the discourse surrounding the updating of accounting curricula. Increasingly, there are calls

for modern accounting courses to incorporate AI, enabling future accountants to gain proficiency with these technologies. Despite this, some AI applications, such as ChatGPT or other large language models, remain an underexplored area within accounting education. Research could, for example, examine students' ability to critically evaluate the responses they receive from AI assistants and make informed decisions based on that data. Furthermore, a line must be drawn concerning the use of AI in routine academic tasks, such as generating summaries or creating presentations. While these practices may be acceptable in an educational context, excessive reliance on AI could lead to underdeveloped skills in the professional environment.

Another crucial consideration is the dynamic nature of updating accounting curricula, which is not a one-time change but an ongoing commitment that will likely occupy accounting educators for the foreseeable future. As regulations evolve and new technologies emerge, it becomes challenging to predict the long-term trajectory of the profession. Efforts by the scientific community to address these changes are undoubtedly significant and valuable, yet they are not sufficiently comprehensive to capture every facet of this ongoing evolution. The case study I presented highlights how closer collaboration with industry practitioners can provide scholars with a better understanding of workplace changes, enabling them to respond effectively. However, empirical data on such collaborations remain sparse in the current research landscape, prompting my call for further studies to address this gap.

In conclusion, while the evolution of accounting education is well under way, its future development relies heavily on a synergy between theoretical research and practical applications. As I have discussed, incorporating AI, modernizing course materials, and fostering stronger partnerships with industry are all critical steps. Yet, achieving these goals will require sustained research efforts, a commitment to innovation, and an acknowledgment of the profession's ever-changing demands.

Concluding Remarks

In the book's opening sections, I highlighted how vibrant the field of accounting education has become in recent years, as interest from both academia and industry continues to grow regarding the education of future accountants. Through an innovative machine learning approach in accounting education research, paired with three distinct empirical studies addressing major gaps identified in the review, I have uncovered several key topics explored in the field over the years and examined its past, present, and future. The findings reveal how scientific production has grown significantly in recent years, with notable spikes following the COVID-19 pandemic, likely because it prompted accounting educators to rethink how courses were delivered altogether. This has been achieved through a detailed, machine learning-powered bibliometric approach (Baker et al., 2024; Beloskar et al., 2024), designed to provide readers with a unique reference point for the past, present, and future of the accounting education domain. The method employed is rigorous, transparent, and replicable at any point in time, enabling comparison and reflection. However, despite the abundance of systematic reviews in accounting education research, this is the first attempt to analyze the entire field using a machine learning approach through LDA topic modeling. Accordingly, this book offers valuable theoretical and practical insights and fresh perspectives derived from a critical overview of the field. This approach is particularly valuable given the significant transformation accounting education is undergoing, requiring collaborative efforts from educators, students, and practitioners to fully harness its potential.

What has emerged from my analysis is that, despite the recent surge in productivity, several avenues for future research remain viable at the present time. Although blended learning proliferated during the pandemic, its adoption and effectiveness continue to pose challenges for accounting educators. While it is evident that traditional F2F learning is unlikely to be fully replaced by automated experiences, the current landscape—with increasing student expectations and tougher competition from online degree programs—demands that traditional institutions keep up with the relentless pace of innovation. The

University of Turin case study underscores the importance of blended learning in accounting education, especially in the Italian post-pandemic context, where student expectations for online education have evolved significantly (Tharapos, 2022). This research addresses a gap by offering empirical evidence on how technology enhances learning, complementing earlier studies by Venkatesh et al. (2023) and Sawan et al. (2024). However, despite efforts to integrate blended learning, it remains secondary to traditional delivery methods, as student demands as the market for fully online degrees continues to grow. The study also highlights the need for proper educator training and robust technological infrastructure to support blended learning effectively. Moreover, there is a pressing call for further innovation in evaluation methods and continuous adaptation of traditional accounting programs to keep pace with modern market demands, ensuring their competitiveness in an ever-evolving educational environment.

Still, in terms of technological innovation, my research addresses a gap in accounting education by examining the factors influencing educators' continued adoption of game-based learning solutions, answering calls from scholars like Silva et al. (2021) and Carenys and Moya (2016). By employing an integrated ECM and UTAUT model, I found that perceived effectiveness (PE) emerges as the primary factor driving the sustained use of game-based mobile learning, with student satisfaction (SAT) and usage behavior (USA) also playing significant roles. These findings suggest that when students perceive these tools as effective in improving academic performance, they are more inclined to embrace them, regardless of usability barriers. Furthermore, the quantitative data offers actionable insights into balancing the effectiveness and practicality of game-based learning to boost student engagement. Future research should delve into additional variables such as institutional support and the trust educators place in game-based learning tools—both of which were statistically insignificant in my dataset—as well as undertake longitudinal studies to evaluate the extended impact of gamification on learning outcomes and career success. As technological advancements continue to reshape gamification in accounting education, subsequent studies could investigate how emerging gaming technologies influence teaching strategies and further foster student engagement within accounting courses. Even though current empirical data does not indicate a clear, universally accepted direction, it is undeniable that placing greater emphasis on student engagement and their learning experience can improve their performance and active participation in the accounting classroom. However, it is the lecturer's critical responsibility to tailor game-based learning to the specific needs of their classes and desired educational outcomes. If game-based learning experiences are not carefully designed,

there is a significant risk of wasting the time of both accounting teachers and students. Having participated in several workshops and conferences on gamification in higher education, I am convinced that seamlessly integrating game-based learning with traditional, F2F course delivery would significantly enhance student engagement. Such an approach would encourage students to challenge themselves and develop skills they might otherwise struggle to cultivate.

The third case study highlights a successful collaboration between academia and practitioners to address the expectations gap between accounting graduates and employers, particularly regarding the integration of ESG and sustainability into the accounting curricula. This program provides a modern take on traditional accounting education, incorporating topics like climate-related sustainability and ESG, which are crucial for future accountants. It aligns with calls from scholars such as Othman and Ameer (2024) and Khosa et al. (2024) for more empirical research on integrating these themes into accounting education. The involvement of practitioners and the use of case studies, guest lecturers, and updated teaching materials are vital in delivering effective ESG education. However, there is still a need for specially designed ESG textbooks and resources. From a practical perspective, the case study demonstrates how modernizing accounting curricula can attract students and help address the growing shortage of accounting professionals with ESG training. By aligning the program with the market's demands and involving practitioners in its design, the D-ESG and Impact Manager master's program provides a pathway for graduates to meet evolving professional standards. The above approach reflects the broader trend in accounting education towards integrating sustainability and climate-related topics (Alawattage & Wickramasinghe, 2024), offering a model for other institutions seeking to bridge the gap between academic curricula and professional expectations. Furthermore, rethinking accounting curricula worldwide is crucial in order to match the demand for accountants with information technology and sustainability competencies and bridge a gap between academia and industry that appears to be significant at the current time. However, all of the above should not come at the expense of sets of competencies and skills that have traditionally been appreciated by accounting students and their respective employers. The importance of balancing both technical and soft skills, namely critical thinking, problem-solving, and adaptability, remains a core principle for accounting education. Thus, it should not be overlooked when designing accounting curricula.

I would like to conclude this manuscript with a few personal reflections on the topic of accounting education. Although this book has been in progress since the final years of my doctoral studies, I am confident that waiting until

2024 to complete it was the right decision. This additional time allowed me to independently deliver an accounting course and broaden my perspective on the subject through valuable practical experience and firsthand knowledge. I also had the opportunity to reflect more deeply on the evolution of accounting education as a literature stream while contributing to the design and implementation of a master's degree focused on ESG and digital technologies. Experiencing both academic and practical aspects firsthand has been instrumental in expanding my understanding of accounting education, its critical role in today's job market, and the challenges faced daily by accounting educators.

On the one hand, my work highlights the strong and growing interest in accounting education from the broader scientific community. On the other, it reveals numerous underexplored areas that would benefit from further research to achieve a deeper understanding. To address these gaps, collaborative efforts among educators, students, and future employers are essential to drive systemic changes. These efforts should aim not only to rethink the content of accounting curricula globally but also to enhance the learning experience for accounting students by fostering greater engagement and interaction in the classroom.

From my interactions with accounting students, I have observed a deep passion for sustainability and environmental issues. More than ever, the realities of climate change and social challenges concern them, inspiring a desire to be the change they wish to see in the world. I believe these students have the potential to become the driving force behind the systemic changes discussed throughout this book.

In addition to the reflections mentioned earlier, the book presents a few methodological caveats that should be considered when interpreting its results. The inherent nature of bibliometric research designs provides only a snapshot of a given literature stream at a specific point in time. As such, it becomes necessary to update the findings by replicating the study periodically to more accurately capture the stream's evolution over time. Furthermore, certain limitations pertain to machine learning approaches and LDA topic modeling. While topic modeling is transparent, rigorous, and highly replicable as a research protocol, the interpretation of the extracted topics remains qualitative and subjective, relying on the researcher's individual perspective. Different interpretations of the same topics could lead to varying conclusions. Given these considerations, I encourage accounting education scholars to replicate this study in the future, compare their findings with mine, and contribute to a more comprehensive understanding of how the field evolves over time.

An additional limitation of this study lies in its reliance on empirical data, raising concerns about replicability. While the approach is novel and offers

valuable contributions for current and future accounting education scholars, future research efforts could expand by collecting additional field data to explore the themes discussed more deeply. Another limitation pertains to the sources used for the analysis. For consistency and data quality, the study relied solely on a single database—Scopus—and included only English-language manuscripts published in peer-reviewed sources. Although this aligns with previous research practices, some valuable contributions may have been excluded due to these filters. Future studies could address this limitation by utilizing multiple databases and broadening the scope of included sources to offer a more comprehensive perspective on the field.

Despite the aforementioned limitations, I believe my contribution will hold significant value for both theory and practice. From a theoretical standpoint, although bibliometric methods are increasingly popular in accounting research, no attempts have been made to examine the entire field using machine learning and topic modeling. Typically, accounting education scholars rely on qualitative systematic literature reviews (Nurkhin et al., 2024; Paisey et al., 2024; Pargmann et al., 2023; Kroon & Alves, 2023). While these reviews are undeniably useful for advancing the field and offering a critical perspective on the current state-of-the-art, they often lack scope and fail to provide a holistic view of the field's evolution. This book addresses an important theoretical gap by delivering a comprehensive analysis of the field's development and presenting future research directions, critically derived from the gaps identified within the sample.

The book also presents several notable practical and theoretical implications. Among the recommendations highlighted throughout the manuscript is the importance of accounting educators dedicating time to mastering emerging technologies and integrating gamification into the accounting classroom. As explored in the book, successful implementation of game-based learning begins with educators who are willing to invest effort in understanding these technologies and further adapting them to meet the specific needs of their students. Another key recommendation involves revising and updating accounting curricula to align with the evolving demands of the job market. At the time of publication, a considerable gap remains between the content of accounting programs and the expectations of future employers. This raises the critical need to reconsider the structure of accounting education, encouraging collaboration among students, educators, and employers to reshape curricula in a way that better addresses the needs and aspirations of all stakeholders.

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