Impact of Digital Transformation on Accounting Profession in the Opinions of Finance and Accounting Students

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Abstract

The article presents findings from a questionnaire-based study conducted among finance and accounting students at two Polish universities from January to March 2024. A total of 305 valid responses were collected from a pool of 602 bachelor, MSc, and post-MSc students, resulting in a response rate of 51%. The primary aim of the study was to gauge students' perspectives on the influence of digital transformation (DT) on the accounting profession. A significant majority (79%) of respondents believe that accountants must continually enhance their digital competencies (DC). Conversely, skills like creative thinking, communication, and teamwork are less prioritized. Simplification and accelerated execution of accounting processes emerge as the most notable benefits of DT, whereas increasing costs associated with employee training appear as a significant drawback of DT. This article contributes to a better comprehension of the need to enhance higher education accounting curricula to meet the demands of insistent digitalization.

Keywords: digital transformation, artificial intelligence, accounting profession, accounting.

1. Introduction

In recent years, there has been rapid development in information and telecommunication technologies, and the emergence of the COVID-19 pandemic in 2020 significantly accelerated digital transformation, mainly in organizations and institutions providing various types of services. Many professions, including accountants, had to adapt to new working conditions and remote work [23]. Moreover, for the past two years, there has been a rapid development in artificial intelligence (AI), which has sparked growing interest among scientists in DT. This is confirmed by the increasing number of scientific studies. Among the over 4,700 works on DT in SCOPUS published after 2015, as many as 65% were published only after 2020 [13].

The impact of information and communication technology (ICT) on business functions is enormous [2], [24]. Significant progress in ICT has already changed the accounting function in businesses and the role of accountants [20], [21], [25], [27]. The accounting industry has undergone several turbulent phases over the last decade [23] due to the emergence of AI, robotics, cloud computing, blockchain, and big data (BD), which have dramatically transformed the entire process of accounting [1], [31]. The accounting profession (AP) is still undergoing significant changes, making it one of the professions that must keep pace with rapid digitization [2], [4]. Nowadays, the influence of DT on AP is even more critical than it was a few years ago and is expected to remain significant for years and even decades to come [6], [11], [15], [17].

On the one hand, from the perspective of people dealing with accounting, DT is

perceived as a threat related to the possibility of job loss [16], because IT allows the automation of processes and work activities that were previously performed by them. On the other hand, DT is recognized as a catalyst for innovation, strengthening AP rather than destabilizing it [7], [19], [26]. The issue of the impact of DT on AP concerns both experienced accountants who graduated many years ago and accounting students who have already started working in the profession or intend to start working after graduation. These students represent Generation Z, which is very proficient in using ICT's. They are digital natives who, from earliest youth, have been exposed to the Internet and mobile systems and concentrate their activities on social media [6], [18]. Hence, it is interesting to explore whether these students perceive more positive or negative effects of DT, or if they feel threatened by the rapid development of AI. The general research problem addressed in this article concerns the perception of the impact of DT on AP by current accounting students.

2. Previous Research

The aim of the literature analysis was to determine the state of research on accounting students' perception of the impact of DT on AP. It was decided to select articles from the Scopus database, which is one of the largest and most reputable bibliographic databases. The search criteria were narrowed to articles, book chapters, and conference papers in English that were published in the 21st century and belonged to and belonged to the disciplines related to social science, business/economy and computer science.

Due to the purpose of the study, search queries were defined to include descriptive phrases: "digital transformation", "digital technologies", "accounting profession", and "accounting students" or "accounting education". The search included metadata such as keywords, titles, and abstracts. In this way, 11 papers were found. Upon analyzing these abstracts, only two papers described research among accounting students. Consequently, a less restrictive query was defined, omitting obligatory phrases related to accounting students and accounting education, yielding 18 texts that met the criteria.

After analyzing the abstracts of these 18 scientific papers, it was found that 6 described research conducted among various respondent groups, such as accounting students, lecturers, employers, and accounting specialists. The first paper involved interviews with over 300 students, university lecturers, and employers revealing that they expect education programs to be adapted to the requirements of advancing digitalization [5]. Another study in Portugal, involving semi-structured interviews with certified accountants, auditors, CEOs, CFOs, and two focus groups composed of lecturers, students, and accounting graduates, identified communication as the most valuable transversal for meeting new professional requirements [3]. A survey among 225 Portuguese accountants highlighted cybersecurity, implementation costs, difficulties in adapting to new working conditions, possible job elimination, and resistance to change, especially among senior specialists, as major threats and challenges [28]. A Romanian survey Romania of 65 accounting specialists indicated their readiness for the rapidly advancing computerization process [20]. An online survey of 559 Generation Z students in Thailand found that logical thinking skills and digital technology proficiency significantly impact internship outcome [10]. Another study [12] revealed that early-career accountants perceive the impact of new technology on accounting skills as significant (73%) and feel mostly or very prepared for technological challenges (63%).

The next eight articles analyzed accounting education programs in the context of required competencies necessary in the era of DT. Research conducted in Portugal [4], Romania [8], and the United Arab Emirates [25], as well as in other studies [2], demonstrated that education programs do not provide the necessary competencies for the AP in the DT era. Four additional articles [15], [21], [29], [32] concluded that traditional knowledge and competencies are insufficient and emphasized the need to develop personal and professional skills such as analytical thinking and skills, abstract and critical thinking, organization, teamwork, responsibility, precision, stability, adaptability and a lifelong learning approach.

The last four papers focused on the impact, opportunities, and challenges that

accounting specialists face due to the development of digital technologies such as AI, blockchain, and decision support technologies. These studies highlighted how AP must transform to leverage these technologies and how accounting professionals can adapt to survive in the evolving landscape [1], [9], [17], [22].

Therefore, digital transformation and accounting profession is not the topic that was investigated in many scientific papers. Given the scarcity of studies among accounting students worldwide and the results of previous research, it is important to address how accounting students, who represent Generation Z, perceive the impact of DT on AP, including the positive and negative effects they see.

3. Research Methodology of Empirical Study

The main goal of the study was to recognize the opinions of finance and accounting students from two public universities in Poland regarding the influence of DT on AP. To achieve this goal, the following research questions were formulated to be answered:

1) What is the general perception of students about how the role of an accountant has changed and continues to change?
2) How do students perceive the impact of DT on the work of accountants and their access to the profession?
3) What may be the positive and negative consequences of DT for AP?
4) What, according to students, are the main obstacles to DT in accounting?
5) Do students feel threatened by the development of AI?

To find answers to these questions, we had prepared an electronic questionnaire and conducted an online survey via the Google Forms platform. The questionnaire comprised both closed-ended single-choice and multiple-choice questions, as well as open-ended questions. The subsequent sections of the paper present the results of the first part of the survey, aimed at exploring DT in the accounting profession, along with the conclusions drawn from the study. The findings from the second part of the study are detailed in another publication [14]. This article focuses on the findings related to students' opinions about the impact of DT on the accounting profession, utilizing descriptive statistics, tabular statements, graphical illustrations, and verbal descriptions to analyze the research results.

The survey was carried out between January 17 and March 8, 2024, targeting students of finance and accounting at the Bydgoszcz University of Science and Technology (BUST) and the University of Gdańsk (UG). Survey distribution was conducted through the official university-managed and Microsoft 365-hosted email systems of the target respondents.

A total of 602 students were targeted with the questionnaire this way, with 325 students from BUST and 277 students from UG asked to fill out the questionnaire. We received 305 responses in total, spread between the two universities (197 from BUST and 108 from UG), achieving an overall response rate of 50.7% (60.6% from BUST and 39.0% from UG). The dataset was then processed in a spreadsheet.

4. Research Results

The study results pertain to 305 respondents, comprising 228 (74.8%) women and 77 (25.2%) men. The majority fell within the age range of 20-30 (88.2%). The most common positions held were junior accountant, junior specialist, or junior analyst (23.6%), followed by accountant, specialist, or analyst (10.2%). Senior positions such as senior accountants, senior specialists, or senior analysts were represented by only 5.6% of respondents. Other positions related to accounting were held by 4.3% of respondents, while the remaining respondents either did not work or held positions unrelated to accounting. Nearly half of the respondents (48.5%) did not work professionally. Among those who did, one-fifth worked in small or medium-sized enterprises (including accounting firms or business services centers), while nearly 15.7% worked in micro-enterprises (including accounting firms) and 15.4% in large enterprises (including business services centers). Regarding education, one-fourth of respondents completed a bachelor's degree in finance and accounting, while only 6.6% completed master's studies in finance and accounting.

Additionally, 5.9% completed post-MSc studies in finance and accounting. In terms of academic progress, the largest portion of respondents were second-year bachelor's students (22.6%), followed by first-year bachelor's students (19.3%) and first-year master's students (19.0%). Third-year bachelor's students accounted for 16.1% of respondents, while post-MSc students comprised 14.8%, and second-year master's students 7.5%. The majority of respondents were students of Bydgoszcz University of Science and Technology (BUST) - 64.6%, with the remaining 35.4% being students of the University of Gdańsk (UG). Table 1 provides detailed data on the number and structure of the students considered in the study.

Table 1. Data on Researched Students.

Year of Study/ University	1st BA	2nd BA	3rd BA	Total BA	1st MSc	2nd MSc	Total MSc	Post-MSc	Total	Total %
BUST	59	69	33	161	22	14	36	0	197	64.6%
UG	0	0	16	16	36	11	47	45	108	35.4%
TOTAL	59	69	49	177	58	25	83	45	305	100.0%
TOTAL %	19.3%	22.6%	16.1%	58.0%	19.0%	8.2%	27.2%	14.8%	100.0%	100.0%

In the first multiple-choice question regarding the general idea of how the role of an accountant has changed and continues to change, the most frequently mentioned responses are presented in Figure 1. Nearly 80% of respondents indicated that accountants must constantly improve their digital competencies, including IT knowledge and skills. Additionally, 66% mentioned that accountants need to follow changing regulations more closely than before, and 47.5% highlighted the growing importance of analytical and reporting skills. The least chosen options were the increasing role of communication skills and teamwork skills.

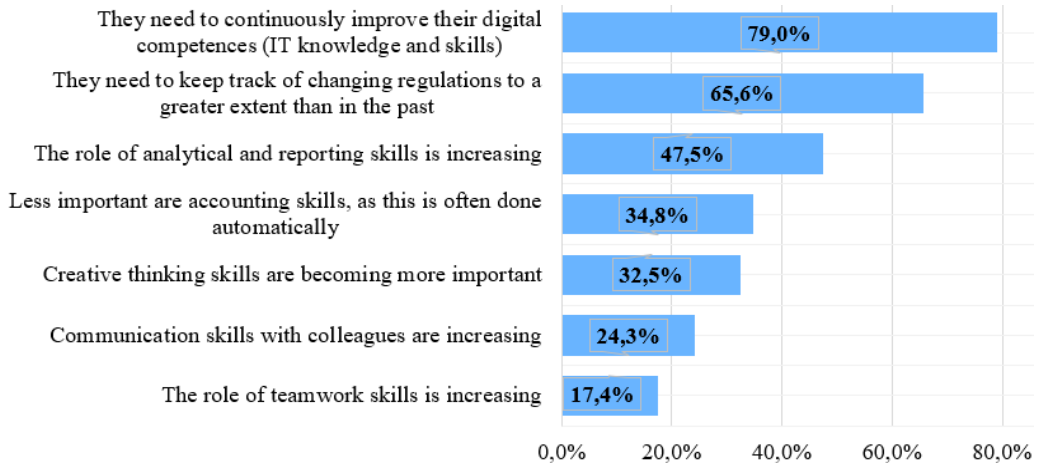

Fig. 1. Students' Ideas of the Changing Role of an Accountant.

The next question examined how students perceived the impact of DT on the work of accountants and access to the profession. They were asked for their opinion on how DT will affect various aspects, including the need to acquire knowledge, the working time of an accountant, the level of experience necessary to work in the profession, the company's expenditure on training, and the availability of the profession. The findings are presented in Table 2.

Table 2. General Impact of Digital Transformation on Accounting Profession.

How DT will affect:	the need to acquire knowledge	accountant's working time	level of experience necessary to work in the profession	company expenditure on training	accessibility to the profession
Not change	22.0%	20.0%	49.5%	18.4%	39.3%
Will reduce	27.5%	74.1%	21.6%	11.2%	36.7%
Will increase	50.5%	5.9%	28.9%	70.5%	23.9%

A half of the respondents believe that DT will increase the need to acquire knowledge,

and three out of four respondents believe that DT will reduce the accountant's working time. Nearly half of the respondents believe that DT will not change the level of experience necessary to work in the profession, and 70.5% of respondents believed that DT would increase the company's expenditure on training. When it comes to the impact of DT on access to the profession, most respondents (39%) stated that it would not change it.

In the next multiple-choice question regarding students' opinions on the negative consequences that DT may bring for the accounting profession, the majority of responses concerned high costs for the employer related to employee training, with 55% of respondents selecting this option (Figure 2). The remaining answers were at a similar level: the need to improve qualifications at one's own expense, loss of job, the need to retrain for another profession were chosen by 49%, 46.6% and 46.6% of respondents, respectively.

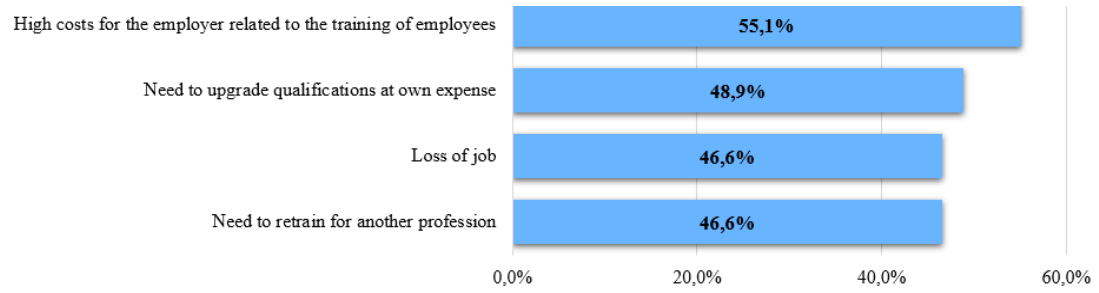

Fig. 2. Negative Effects of Digital Transformation on Accounting Profession.

In the next multiple-choice question, consisting of 11 options, students were encouraged to express their opinions on the positive consequences of DT for AP (Figure 3).

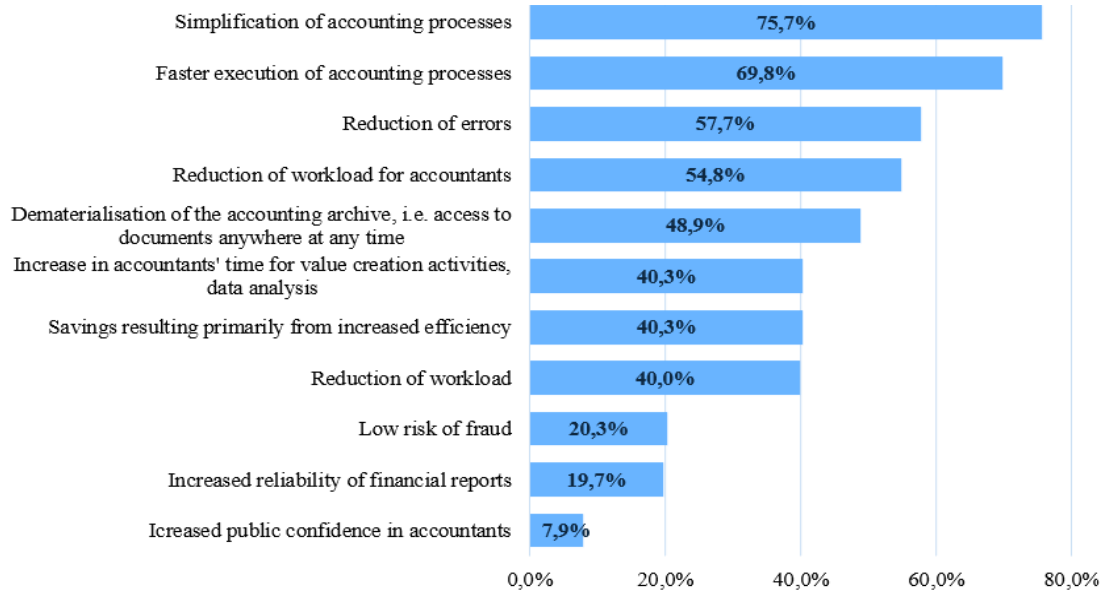

Fig. 3. Positive Effects of Digital Transformation to Accounting Profession.

The results indicate that, in addition to simplifying accounting processes and executing them faster, more than half of the respondents also included a reduction in the number of errors and a reduction in the workload of accountants as positive consequences. Less than half of the respondents chose dematerialization of the accounting archive (49%), reducing the amount of work (40%) or savings resulting primarily from increased efficiency (40%). Additionally, 40% of respondents believed that accountants will have more time for activities related to value creation and data analysis. Every fifth person indicated a low risk of fraud and increased credibility of financial reports as potential positive consequences.

For 8% of respondents, an increase in public trust in accountants was seen as a positive consequence of DT.

Respondents identified several main obstacles to DT in the accounting profession (Figure 4). Almost 60% pointed out insufficient technical resources, and about 53-54% indicated that higher education is not adapted to technological development and that there are insufficient financial resources. Less then 50% selected threats related to cybersecurity, insufficient employee training, and resistance to change (49%, 47% and 42% of respondents, respectively).

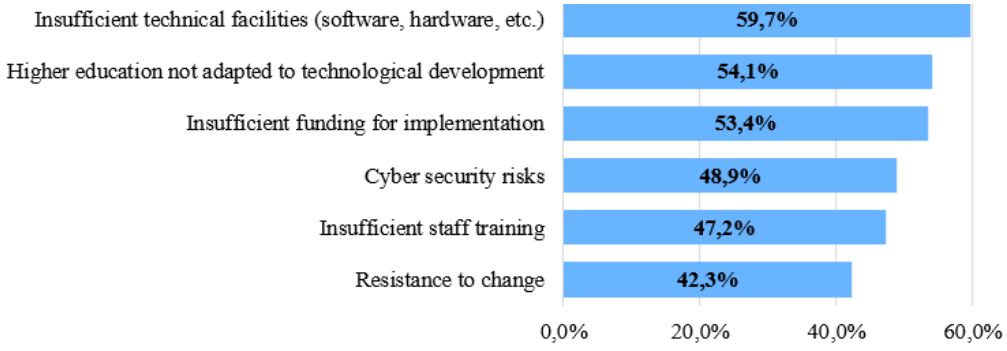

Fig. 4. Main Obstacles to Digital Transformation in Accounting Profession

The subsequent three questions explored threats and concerns related to the development of AI in the context of work in the accounting profession, as well as the necessity to alter the model of developing competencies at universities. The results are detailed in Table 3 and categorized based on respondents' current year of study.

Table 3. Concerns about the Development of Artificial Intelligence for Accounting Profession.

Question	Do you feel threatened by the development of AI?				Are you afraid of losing your job or having difficulty in finding one as an accountant due to the development of AI?				Do you think it is necessary to change the model of competence development due to the development of ICT and AI at the university level?			
Answer	**No**	**I don't know**	**Yes**	**Total**	**No**	**I don't know**	**Yes**	**Total**	**No**	**I don't know**	**Yes**	**Total**
All respondents	34.8%	20.6%	44.6%	100%	44.9%	23.3%	31.8%	100%	17.0%	6.9%	76.1%	100%
1st year BA	35.0%	25.0%	40.0%	100%	41.7%	25.0%	33.3%	100%	6.7%	28.3%	65.0%	100%
2nd year BA	31.9%	20.3%	47.8%	100%	31.9%	24.6%	43.5%	100%	15.9%	27.5%	56.5%	100%
3rd year BA	29.2%	20.8%	50.0%	100%	50.0%	18.7%	31.3%	100%	4.2%	8.3%	87.5%	100%
All BA	32.2%	22.0%	45.8%	100%	40.1%	23.2%	36.7%	100%	9.6%	22.6%	67.8%	100%
1st year MSc	36.2%	17.2%	46.6%	100%	48.3%	24.1%	27.6%	100%	5.2%	10.3%	84.5%	100%
2nd year MSc	36.0%	12.0%	52.0%	100%	40.0%	20.0%	40.0%	100%	0.0%	4.0%	96.0%	100%
All MSc	36.1%	15.7%	48.2%	100%	45.8%	22.9%	31.3%	100%	3.6%	8.4%	88.0%	100%
Post MSc	42.2%	24.4%	33.3%	100%	62.2%	24.4%	13.3%	100%	2.2%	11.1%	86.7%	100%

Almost 45% of respondents express feeling threatened by the development of AI, while 35% do not share this sentiment, and every fifth respondent has no opinion on the matter. When considering the results in terms of respondents' current year of study, the majority of undergraduate students express such concerns (46%), with almost every third holding the opposite opinion. This trend is similar among master's students (52% concerned, 36% not concerned). Notably, among post-MSc students, 42% of respondents do not feel threatened by the development of AI, while every third person does. However, 45% of respondents overall do not fear losing their job or having difficulty finding an accounting position due to the development of AI. Almost every third respondent expresses such concerns, while almost every fourth replied that they did not know. Among second-year BA degree students, a notable portion fear losing their job or facing difficulties in finding

one due to the development of AI (43.5%), as do 40% of second-year MSc degree students.

More than three-quarters of respondents believe it is necessary to change the model of developing competencies resulting from technological development and AI at the university level. Only 7% hold the opposite opinion, and the remaining 17% are uncertain. While the majority of first-year and second-year bachelor's students also share this opinion, 28% and 27.5%, respectively, are unsure. This uncertainty might stem from their early stage of studies, limiting their familiarity with the practical aspects of competency development models at universities. Notably, the higher the year of study, the greater the share of respondents advocating for changing the model of competencies progression due to the development of ICT and AI at the university level.

5. Discussion

Our study confirmed the growing importance of analytical skills, as emphasized in the works of [15], [21], [32]. However, less valued turned out to be creative thinking and communication skills, which contrasts with findings in [21]. Similarly, teamwork skills were also less valued, contradicting [15]. The vast majority of students (almost 80%) emphasized the need to continuously improve their digital competences. This aligns with [29], which states that 'adaptability' and a 'lifelong approach' are essential personal qualities for future accountants.

Findings presented in [12] showed that over 70% of Generation Z accounting students displayed preparedness for new technology challenges. In contrast, our study, albeit not directly addressing the same question, reveals that 45% of respondents feel threatened by the development of AI. This discrepancy suggests a notable difference in perception between the two cohorts, indicating a potential gap in preparedness or differing perspectives on technological challenges. Similarly to our study, findings presented in [28] emphasize cyber security risks, implementation costs, and resistance to change as major threats and challenges facing the accounting profession, according to Portuguese professionals in the domain. In contrast, our study highlights insufficient technical equipment (potentially linked to security threats) and inadequacies in higher education institutions' readiness for digital change in educating future accounting professionals.

6. Conclusion and Further Research

The rapidly altering business world necessitates that universities prepare finance and accounting students to keep up with the transforming reality in the workplace they currently inhabit at or will enter as alumni. In our study, involved 305 respondents at two Polish universities, we explored students' opinions on the impact of DT on the accounting profession.

Our first issue addressed students' general perception of how the role of an accountant has changed and continues to evolve due to DT. We found that four out of five students believe accountants need to continuously improve their digital skills. Two thirds consider keeping track of changing regulations more important than before, and almost half appreciate the increasing role of analytical and reporting skills. When asked about their perception of DT's impact on the work of accountants and access to the profession, three-quarters of students think that the accountants' working hours will be reduced and that enterprises will increase their training expenditure. Half of the students believe DT will necessitate acquiring new knowledge, while every second student claims that the level of experience necessary for the profession will remain unchanged. Just under a third believe that accessibility to the profession will be reduced.

Among the negative consequences of DT, respondents identified the higher cost of employees training as the most important factor. In contrast, the simplification and faster execution of accounting processes were seen as positive effects. The main obstacles to DT in accounting, according to respondents, are insufficient technical facilities in enterprises, insufficient funding for implementation, and higher education not being adapted to technological development. The study shows that the development of AI is perceived as a threat by slightly less than half of students (with post-MSc students being less concerned).

Conversely, the same proportion is not afraid of losing their jobs or having difficulty finding ones, though 66% of post-MSc students expressed this concern.

In students' opinions, university-level education in accounting must adapt to developments in ICT and AI. About 76% of all respondents are convinced of this need, with the rate increasing accordingly to the year of study, peaking at 96% for second year MSc students and 87% for post-MSc students.

The authors are plainly aware of the inherent limitations of the study which was carried out in only two universities in Poland and involved only a portion of all their accounting students, although it achieved a relatively high response rate of 51%. Responses from different respondent groups should also be subjected to extended analysis.

Further studies should be conducted nationally and globally to reshape accounting syllabuses and integrate modern digital competencies. Future research should focus on enhancing digital skills among accounting students and academics, addressing the evolving demands of digitalization in education. While students are often the focus of research, academics also need support in developing necessary digital skills to teach effectively. Studies should also consider age-related constraints, providing additional resources and support for educators to adapt to digital changes.

This article contributes to a better understanding of the urgent need to enhance higher education accounting curricula to meet the demands of digitalization in the accounting domain. It provides valuable insights into students' perceptions of the opportunities and threats that digital transformation creates for professionals and the accounting profession itself. To some extent, it may also suggest that academic decision-makers address students' expectations by equipping educators with the knowledge and skills necessary to meet students' needs.

Despite its limitations, the study serves as a stepping stone for further research and educational reforms aimed at aligning accounting education with the demands of the digital era.

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