

THE FOURTH INDUSTRIAL REVOLUTION AND ACCOUNTING PROFESSION: A REVIEW OF LITERATURE

Elijah Adeyinka ADEDEJI

Department of Project Management Technology, School of Logistics and Innovation
Technology, The Federal University of Technology, Akure, Ondo State, Nigeria
eaadedeji@futa.edu.ng
+2348062631870

Abstract

Fourth industrial revolution (4IR) is a massive paradigm shift in industries, businesses and professions. It brings about revolutionary changes in almost all areas of business operations and professional practices. The accounting profession is especially under the disruptive influence of new technologies related to 4IR. The adoption of smart technologies is changing conventional accounting jobs and practices, and the role of the accountant has to be redefined in accordance with the changing practices and work processes. The current paper seeks to discuss the skills that future accounting students need by studying the available literature on the implications of 4IR to the accounting field and the graduate preparedness to work in the new environment. Past studies indicate the disconnect between the graduate competencies and the ones required to be successful in the long term. By conducting a thorough literature review, this paper finds ways that universities can use to fill this skills gap. These findings are particularly informative to institutions of higher learning that want to incorporate the concept of 4IR in their curricula, hence yielding graduates who are competent and workforce-ready.

Keywords: *Accountants, Accounting skills, Career readiness, Fourth Industrial Revolution, University*

1. INTRODUCTION

The fourth industrial revolution (4IR) is the term that describes the implications of technology in various sectors of the global economy and in the industries of the Nigerian economy, such as the sector of services, banking, accountancy and industry (Adeniran, 2022). The predictions seem frightening at first sight when the book by the German author Klaus Schwab is considered, the title of which is *The Fourth Industrial Revolution*. Schwab (2018) states that the technological wave diffused in the middle, unlike the previous Revolutions that involved a technology of the matrix that drove the Industrial Revolution and the automotive industry, and microelectronics. According to the digital connection, a number of technologies will speed up this third Industrial Revolution.

The Fourth Industrial Revolution is in progress, and major improvements in the methods of work of specialists in their respective fields (Ferrari, 2019). Bryant (2021) bases his research on a survey he conducted among 3,000 accountants, and 90% agreed with the idea that there was a cultural change in accounting. The fourth industrial revolution will

soon happen, and it will cause a change more significant than all three prior revolutions put together due to its peculiarities. These features are some of the speeds of changes that took place, and their breadth and depth, which indicate how the new views can transform organisational systems simultaneously and rather complexly. With these driving forces, there is a growing expectation that many changes will result in the nature and characteristics of employment due to technological innovations, leading to worries concerning the number of jobs that will be automated or removed. Experts in various disciplines, such as economics, technology and employment, make numerous predictions on the daily technological developments in businesses, industries and the labour market. These forecasts are eye-opening in terms of the changes that will occur in the field of technology, the economy, and the financial sector due to the great impact of these changes and their irreversibility (Schwab, 2018). Schwab (2018) adds that among the themes of the fourth industrial revolution is the Digital Revolution that will be the primary driver of change in terms of the notions regarding professional ties, as well as interaction and collaboration among people and organisations.

The current and traditional accounting processes, procedures, and methods will be rendered obsolete in the digitalised company world. In order to align with the 4IR agenda, accountants will embrace the automation of the current accounting processes. In order to understand the impact of 4IR on the accounting profession and the readiness of accounting graduates for the work in 4IR, this research attempts to offer some explanations on the influence of 4IR on the accounting profession and the readiness of recent accounting graduates to work in 4IR is explained here.

Literature Review

2.1 Technological Innovation and Automation

The key driver of change in the accounting profession, represented by the 4IR, is technological innovation and automation. As Krushopf et al. (2022) point out, AI, Robotic Process Automation (RPA), cloud computing, and blockchain technologies are introducing substantial changes in accounting practices by digitalising them. These solutions are automating and simplifying the more routine accounting tasks, including data entry, reconciliations, payroll, and recording transactions (Leitner-Hanetseder et al., 2023).

Intelligent systems are more efficient and accurate as they analyse financial data based on patterns and implement predictive analytics and anomaly detection (Omar and Hasbolah, 2020). Identical technology, notably blockchain, offers transparent and immutable records, reducing the risk of fraud and permitting auditing to occur constantly (Tektufekci, 2021). Equally, big data analytics also enable accountants to recognise trends and offer evidence-based insights, as cloud computing helps with remote collaboration or real-time access to financial data (Damayanti, 2021). These innovations have transformed accountants to be manual data processors to strategic advisors. The implementation of automation tools has decreased everyday workload and increased the needs of professionals who can interpret and authenticate machine-generated reports (Ghani and Muhammad, 2021). Accountants, in turn, have to be not only knowledgeable

in technical accounting but also digitally literate and capable of operating in intelligent systems (Jarosz et al., 2022).

Essentially, technological innovation and automation boost productivity and reliability yet aggravate new problems associated with system monitoring, cybersecurity, and ethical data utilisation. To cope with the technical and ethical aspects of digital transformation in the financial reporting and audit setting, accountants have to build their competencies (Rosi and Mahyuni, 2023).

2.1.1 Competency and Skills Transformation.

Competency and skills transformation is the second significant source, which defines the way 4IR is transforming the knowledge base and abilities demanded by accounting professionals. With machine work substituting the repetitive work, the pressure on hybrid skills, a mix of accounting skills, digital literacy, critical thinking, and interpersonal communication, has become paramount (De Villiers, 2021). The World Economic Forum (2020) states that the future workforce needs to be able to think critically, solve complex problems, and be flexible in thinking to be relevant in an environment that is technology-driven. In the field of accounting, these capabilities can be applied as the capability to comprehend data, apply business intelligence, and make knowledgeable financial judgments (Ghani and Muhammad, 2021). Data-driven decision-making has transformed the role of accountants not only to the recorder of information but also to the interpreter of information (Li, 2022). Besides, the relevance of digital and ethical competencies in contemporary accounting requirements has been reinforced by professional accounting organisations like the Association of Chartered Certified Accountants (ACCA) and the International Federation of Accountants (IFAC) (IFAC, 2021). The constant improvement of the profession (CPD) has come to be a necessity, as technological progress requires life-long learning and adjustment (Abbasi et al., 2020).

There is a transformation of skills process that not only entails technical expertise but also incorporates soft skills like moral judgment, leadership, and communication. These humanistic qualities assist accountants in practising professional scepticism and make appropriate ethical judgments in the interpretation of AI-generated results (Omar & Hasbolah, 2020). Therefore, the future of accounting is in individuals who can strike the right balance between technological smarts and human judgment, which will guarantee accountability and transparency in the automated environment (Moll and Yigitbasioglu, 2021).

Employability and lifelong learning. 2.1.2.

Employability and Lifelong Learning is the fourth important force behind the transformation of the accounting profession in the Fourth Industrial Revolution (4IR). This driver also highlights the need to have constant development of the profession (CPD), dynamic learning and career reskilling throughout life so that the accountants do not fall behind in the ever-evolving dynamic technological landscape. The 4IR has turned the labour market into a field where agility and learning ability are prioritised above fixed qualifications (World Economic Forum, 2020). As a result, the phenomenon

of lifelong learning has become a key characteristic of employability in professions like accounting (IFAC, 2021; Yusof and Jamaluddin, 2020). Yusof and Jamaluddin (2020) argue that the growing rate of digital innovation has rendered employability a dynamic concept that goes beyond having formal academic qualifications. The ability of an individual to learn, unlearn, and relearn is becoming one of the defining elements of employability in the 4IR century, as opposed to having a predetermined technical knowledge. The capacities of accounting professionals that rely on technological tools should be changing, as they change. The attitude of lifelong learning is also the expected habit that accountants should develop, backed by the professional communities, CPD courses, and the opportunities of online learning (Abbasi et al., 2020).

The sustaining mechanism that bolsters the rest of the drivers of transformation of the accounting profession is employability and lifelong learning. Technological innovation transforms professional tools and processes, and educational reforms create the foundational knowledge, but lifelong learning keeps these competencies up to date, competitive, and responsive to the future. This driver thus makes the adaptive cycle of professional evolution in the 4IR era complete, implementing continuous learning as a key feature of the modern accounting practice (Yusof and Jamaluddin, 2020; IFAC, 2021).

2.2 Theoretical Review

The theory of Socio-Technical Systems (2.2.1) is presented in the provided article.

The Socio-Technical Systems (STS) Theory is the theory, thought by Trist and Bamforth (1951), which assumes that all organisations operate based on the interplay of two interdependent systems: the technical subsystem (machines, tools, technology and processes) and the social subsystem (people, skills and structures). The theory states that sustainable performance and innovation are achieved when the two systems are optimised together instead of being optimised separately.

2.2.2 Human Capital Theory

The Theory of Human Capital (HCT) was popularised by Becker (1993), who claims that people and society receive economic benefit due to investment in education, skills, and professional advancement. In this school of thought, human capital is viewed as an asset of capital that enhances productivity, innovation and long-term growth. In relation to the accounting profession, this theory emphasises the need to have education, training and life-long learning to remain employable in the 4IR era. With the automation and digitalisation of accounting work affecting the tasks performed by accountants, the human capital as analytical skills, technological and ethical talents of accountants, will become the primary distinguishing factor of professional value (De Villiers, 2021; Yusof and Jamaluddin, 2020). According to the theory, the capacity of the profession to keep up with the technological disruption is directly linked to the continuous investment in human capital in the form of constant professional development (CPD) and the reform of curricula (Abbasi et al., 2020).

In the accounting field, TAM is useful in explaining the differences in the adoption of digital technologies like AI-based auditing software, cloud accounting software, and data analytics software by accountants and firms. According to the studies conducted by Jarosz et al. (2022) and Omar and Hasbolah (2020), perceived competence, training, and organisational support have a strong impact on the attitude of accountants towards the implementation of technologies. Thus, the theory emphasises the significance of competency growth and education as a source of technology acceptance.

Technology Acceptance Model (TAM) 2.2.3.

Another theoretical perspective that the 4IR situation can be examined through is the Technology Acceptance Model (TAM) developed by Davis (1989). It describes the way users accept and make use of the technology, grounded on two key constructs, which are perceived usefulness and perceived ease of use. When people feel that a technology will improve their job performance and is simple to use, the chances of using it are high (Venkatesh & Davis, 2000). In the accounting field, TAM can be used to explain differences in the adoption of digital technologies by accountants and firms in the form of artificial intelligence-based auditing software, cloud accounting software, and data analytics platforms. Studies by Jarosz et al. (2022) and Omar and Hasbolah (2020) reveal that perceived competence, training, and organisational support have great impacts on the attitude of accountants towards the adoption of technology. Thus, the theory emphasises the significance of competency building and education as the drivers of technology acceptance.

2.3 Empirical Review

The empirical research on the effect of the Fourth Industrial Revolution (4IR) on the accounting profession has shown that there is a current widespread technological as well as educational and professional change that is happening in both global and regional environments. There is emerging evidence that digital innovation, especially automation, artificial intelligence (AI), and blockchain, is transforming the definition of accounting practices, skills, and employability. Leitner-Hanetseder et al. (2023) and Kruskopf et al. (2022) discovered that accounting processes using automation and cloud-based systems contribute significantly to accuracy, efficiency, and decision-making, as they substitute professional duties with strategic analysis tasks.

Studies by experts on the transformation of skills and competencies continuously point to a growing gap between the traditional accounting training and the technical skills required by the practice. Digital literacy, critical thinking, and analytical reasoning turned out to be the determinants of professional success more than conventional bookkeeping skills indicated by De Villiers (2021) and Ghani and Muhammad (2021). As Abbasi et al. (2020) highlighted, numerous institutions in the developing world continue to use old pedagogies, which result in graduates who are ill-equipped to work in data-driven accounting systems. Jarosz et al. (2022) coined the term Accountant 4.0, which refers to a professionally technologically competent expert who is able to combine knowledge of accounting and IT skills and ethical judgment, and Stancheva-Todorova (2021) emphasised the fact that in Eastern Europe, accountants have little

practice with digital tools. All of these findings confirm the fact that continuous upskilling and hybrid competencies are the key to professional sustainability in the 4IR era.

The importance of education and curriculum reform in the accounting programs and their alignment with the realities in the industry is also emphasised in the empirical literature. Li (2022) and Maria et al. (2020) discovered that a small number of universities have provided courses on data analytics or AI applications to accounting programs, whereas project-based and experience-sharing learning techniques are highly effective at enhancing the digital readiness of students. Adebayo and Abdulrahman (2023) noted that despite Nigerian institutions knowing digital transformation, the lack of appropriate infrastructure and proper training for the faculty members is a hindrance to implementing changes. Equally, Jackling and De Lange (2009) previously showed that employers require graduates to have applied and technology-oriented skills that are still not probed in most programs. Such studies show that a successful redesign of curriculum, with principles of Education 4.0 and the increased cooperation between universities and industry, is the key to overcoming the long-term skills gap.

Empirical literature reveals that the 4IR is significantly altering the accounting profession using four reinforcing processes, which include technological innovation and automation, competency and skills transformation, educational reform, and lifelong learning. The current research, however, concentrates on established economies, and there is a gap in contexts in new markets like Nigeria. In addition, not many have studied these four drivers in a comprehensive context, and this necessitates integrative studies that will examine the combined effects of these drivers on professional adaptation in the digital age.

2.4 Conceptual framework

These four moderating drivers, Technological Innovation and Automation, Competency and Skills Transformation, Educational and Curricular Reform, and Employability and Lifelong Learning, all have a moderating effect on the Accounting Profession that is mediated by Organisational Readiness and Regulatory Environment, with the strength and direction of these effects both depending on Organisational Readiness and Regulatory Environment.

METHODOLOGY

In order to find out relevant research, the broad database search involved a variety of databases. The previous research on 4IR and the accounting profession was extracted using electronic resources, such as ResearchGate, Google Scholar, ScienceDirect, ProQuest, and SAGE Journals, where the journal articles were published between 2010 and 2024. The concentrated search provided articles through a filtered search involving a specific emphasis. The primary areas of interest in the targeted search were the impact of 4IR on accounting, 4IR-relevant skills, and the readiness of accounting graduates to work in 4IRs, taking all the years between 2010 and 2024.

3. RESULTS AND DISCUSSION

The Implications of 4IR to the Accounting Profession and Career Readiness of Graduates.

The 4IR Redefining the Accounting Profession.

The 4IR will certainly impact the field of accounting positively and greatly. The evolution of the accounting profession presupposes business, political, and technological growth in 2025 and the shift in the attitude to the profession in society (Raporu, 2018). Islam (2019) has identified three primary barriers to would-be accountants. The building of intelligent technologies, the globalisation of financial reporting or disclosure, and the creation of new or stricter rules are some of the changes that are expected to alter the role of accountants (Islam, 2019). To live up to the expectations of the stakeholders in the 4IR transition will entail the accountants to be more attentive to the same and adjust.

Table 1 provides a detailed overview of how accounting activities have changed gradually over time.

Table 1: Gradual transformation of accounting tasks over the period

Accounting Task	Past Situation	Present Situation	Future Situation
Data Entry	Accountant	Operator/Accountant	Artificial Intelligence (AI)
Bookkeeping	Accountant	Accounting Software	Software/ Artificial Intelligence
Compliance Work	Accountant/Auditor	Compliance Software	Artificial Intelligence (AI)
Document Collection (e.g. Driving to Clients to Pick Up Documents)	Accounts Staff collected documents physically	Document shared via email.	Documents shared via secure cloud platforms
Preparing Bills, Giving Requisition	Accounting Software-Billing Software, Purchase	Requisition Software	Machine Learning
Preparing Ledger	Accountant	Spreadsheet and Software	Software
Receipt Reconciliation	Accountants need to "balance the chequebook"	Software	Machine-readable data can then be reconciled with them
Audit Investigation	Auditor(manual investigation)	Use of forensic software	AI-driven forensic analysis
Tax Document Preparation and Calculation	Accountant Software	Machine Learning	Algorithm-based automation

Preparing Financial Statements	Accountant Accountants through the help of ERP, SAP Software	XBLR (Automated Annual Reports)	XBRL / Fully automated reporting tools
--------------------------------	--	---------------------------------	--

Source: Akhter and Sultana (2022)

These studies have explored the technical innovations of the Fourth Industrial Revolution (4IR) that have been applied to the profession. The use of modernised accounting and financial reporting reveals that technology is becoming more advanced in the realm of accounting (Hoffman, 2019). The financial reports are developed with the help of the latest technical innovations like distributed ledgers powered by blockchain, knowledge-based systems, artificial intelligence application, and XBRL-based structured digital financial reporting (Hoffman, 2019).

The discovery of intelligent technologies in accounting, including blockchain and cloud computing, will radically change the duties and roles that accountants are currently performing. In Turkey, the Revenue Administration of the Turkish Ministry of Treasury and Finance initiated and monitored the use of an electronic app known as e-Accounting Application (Tektufekci, 2021). The latest thing that transpired as a consequence of the adoption of e-accounting Applications is the Electronic Financial Reporting Project, in which audited financial reports were processed independently in a computerised setting and the findings used in financial analysis. The e-Accounting Applications, as referred to by 4IR, can transform the accounting processes into an electronic cloud system. The updated accounting processes and procedures will mean that accountants will complete their accounting tasks differently. Accountants under 4IR will be forced to follow a different path and a different way of operation. Digital and technical innovations through smart use will significantly improve the effectiveness and efficiency of the work of accountants. AI-based technologies will be able to completely process data and conduct other routine and frequent tasks. By performing less manual work, accountants will have time to assess their functions and focus more on their other strategic and visionary tasks. Therefore, it will enable accountants to focus on data analytics, innovative and judgmental analysis, and financial advice work (Akhter and Sultana, 2020). Accountants will prioritise management operations over accounting-related issues to create value for the company by keeping in mind long-term goals (Jarosz et al., 2022). (Ghani & Muhammad, 2021). Accountants will, therefore, be more helpful in suggesting and assessing key business actions that will drive the firm to the next level (Wadan et al., 2021). Thus, it makes a tremendous difference in the job of an accountant.

Additionally, Rosi and Mahyuni (2023) suggested that the accountant ought to monitor the activities being done by these advanced and smart technologies. It is their duty to monitor and identify system failures. Judgment and interaction with people are required to give a solution. Moreover, Leitner-Hanetseder et al. (2023) and Losbichler and Lehner (2023) also believed that human-machine collaboration is necessary in tasks that involve human decision-making and judgment. In some processes that technologies alone are difficult to accomplish, a human being and technology coexist as co-actors. As an

example, performance management and monitoring operations (Moll and Yigitbasioglu, 2021; Zheng, 2021), forecasting operations (Losbichler and Lehner, 2023), and other conventional processes. Consequently, it leads to a human-machine alliance to perform some accounting activities. Accountants will have to embrace and manage technological advancements to become successful in the digital era. Certainly, the adoption of technology into the routine operations and functions of accountants will emphasise that the accounting community will need new learning and skills (Rosi and Mahyuni, 2023; Wahyuni, 2022). The development of accounting knowledge should be aligned with the 4IR development. In the 4IR era, which is fast-paced, the capacity of an accountant to uphold his or her current accounting skills is going to be a survival factor. Instruction and training may facilitate the creation of knowledge and skills that would fit the 4IR standards. The emergence of 4IR is based on the creation of efficient human capital and intellectual resources (Li, 2022).

Accountants are changing their duties and responsibilities, so it is good to possess the competencies and abilities required in these new tasks. Future accountants will encounter tougher challenges to fulfil the qualification criteria of an accountant according to the 4IR (Stancheva-Todorova, 2021). The competence of accountants is likely to change, and this will affect the capacity of the education system to generate future market-employable accountants (Jarosz et al., 2022). The impact on the future of the job market and graduates of accounting is undeniable.

Skills Profile Future Accountants.

Due to the proliferation of this technology in 4IR, employers are more interested in the ability of the candidates to handle the intelligent technologies in the labour market. Accountants expected that the computerisation of the accounting processes would require the recruitment of graduates who had the skills to work in this new setup. Young graduates should learn and build technology skills because robots and technologies are stealing the work of most accountants (Ghani and Muhammad, 2021). Raporu (2023) indicates that the accounting profession will change by 2025 due to the growth of smart technologies, globalisation of business and professions, changes in regulations and governance and the changes in public views of business and the accounting profession. These variables will cause the current competencies and skills of future accountants to change. Stancheva-Todorova (2021) has therefore described the profile of knowledge and skills that aspiring accountants in 4IR should possess. It comprises knowledge and skills relating to digital technologies, big data and data analytics, robotics and artificial intelligence, cyber security, and tax implications, including legal and regulatory requirements. An accountant who wants to work in the 4IR requires renewing their skills with an orientation towards high technical skills, ethics, and communication skills (Raporu, 2023). Khanh (2020), Purnamasari et al. (2021), and Rhodes and Rhodes (2021) all agree that acquiring IT knowledge and skills is important when we are on the edge of the digital age. Proficient graduates using IT tools are provided with benefits. Additionally, there is a need to inculcate in fresh accounting graduates the appropriate combination of hard and soft skills relevant in 4IR. Krushopf et al. (2022) have provided a list of relevant technical and soft talents suitable for 4IR work.

In addition, De Villiers (2010) has developed five core competencies which are relevant in operating a complex and dynamic company environment. These capabilities are known as self-management skills, problem-solving and critical thinking skills, leadership and teamwork skills, and ethical and moral principles. Another study conducted by Tsiligiris and Bowyer (2023) aimed at identifying the right skills that could be compatible with the 4IR job. The authors identified four important competencies that will help accountants overcome the disruptive impact of technology on business and accounting. The competencies are related to technology and data, business, ethics, and soft skills. These are considered success-oriented talents. With such skills, accountants will easily adapt to the changes in their line of work and position. Learning non-financial skills like leadership, information technology, and analytical skills will allow future accountants to address the challenges of the business and society and work with technology (Surianti, 2022). These skills become useful because the work of the current accountant demands a long-term perspective that is 4IR-oriented. Besides the skills mentioned above that have been identified in previous studies, the World Economic Forum (2018) has provided eleven critical and fundamental skills that are required in 4IR. These capabilities will better prepare accountants to handle the 2022 Future of Work. Among the recognised talents are complex problem-solving, critical thinking, creative thinking, people management, interpersonal coordination, emotional intelligence, judgment and decision-making, service orientation, ability to negotiate, and cognitive flexibility (World Economic Forum, 2018). Without a doubt, these skills are the best in the list of options 4IR applicants can make. These talents will be of help to the graduates since they will help them excel in the jobs they will take in the future. Accounting graduates should learn these skills and develop a good profile of skills before getting a 4IR job.

The Career Readiness of Accounting Graduates to work under 4IR.

Yusof and Jamaluddin (2020) suggest that to be employed, graduates should learn to apply and sell broader skills instead of being focused on an academically based technical knowledge of the field. As Abdullah et al. (2022) explain, the readiness of a graduate to the job market is gauged by the ability to effectively employ acquired skills in the institution to secure employment. The concept of career readiness puts emphasis on the ability of graduates to enter the profession without any difficulty and ensures that they meet the requirements to be employable over a long period of time (Spanjaard et al., 2020). With the relevant skills, graduates will be in a position to join the workforce, retain their jobs, and enhance their jobs with time. Table 2 provides a summary of the graduate preparedness to work in 4IR. According to these searches, there were diverse answers among the students, with some indicating that they were ready to work in 4IR and others were yet to know how 4IR would impact their future. This brings up a question to the industry: Is the next generation ready to enter the profession and start on 4IR?

Table 2: Graduates' readiness for employment in 4IR

Authors	Sample	Method	Finding
Teng <i>et al.</i> (2021)	Undergraduate students from two universities (China and Malaysia)	Questionnaire, Survey	The graduates will be empowered to join the workforce, retain and advance their jobs with the right skills as time goes by. Table 2 summarises the graduate preparedness in 4IR in employment. These studies have shown that the students had various reactions to this investigation, with some feeling that they were ready to work in 4IR and others yet to know the impact of 4IR on their future. This brings about a question on behalf of the industry: Is the next generation ready to enter the profession and move on to 4IR?
Purnamasari <i>et al.</i> (2021)	Ninety accounting students from Indonesia	The qualitative method, which consists of interviews and focus group discussions	Accounting students are still unprepared to enter the job market of the 4IR because their learning institutions failed them in their education to equip them with knowledge of the job market. Their concerns on being fit in digital age are largely due to three factors, the first is their ignorance on the operation of information technology and system; the second factor is the insufficient facilities and infrastructure offered to them in their academic institutions to aid in teaching and learning in the new digital age; and the third factor is the inability of the educators to use the technologies in delivering learning contents in teaching and learning activities.
Rahmat <i>et al.</i> (2021).	One hundred and ninety (190) undergraduate diploma and first-degree students from five Malaysian public universities.	Online survey questionnaire	The undergraduate students thought they had the necessary abilities to work under 4IR. Cognitive flexibility, critical thinking, negotiation, decision-making, and service orientation are the five main talents that have been identified. This suggests that if individuals possess these vital abilities, they can satisfy the

			expectations of their employers.
Omar and Hasbolah (2022)	Undergraduate accounting students at the University of Selangor	Questionnaire Survey	Most accounting students are familiar with the 4IR. They are eager to learn more about this Industrial 4.0 era and are driven to participate in it. Lastly, students understand how 4IR will impact their ability to find work in the future labour market.
Adnan <i>et al.</i> (2023)	ASEAN student leaders from five polytechnics located in Brunei, Indonesia and Malaysia.	The qualitative method, which consists of interviews and focus group discussions	ASEAN tertiary students have no idea what skills are required for 4IR. The pupils' level of preparation was low as a result, and they lacked the necessary tools to engage in 4IR employment. Discouragement towards 4IR may stem from worries about potential disruptions caused by this era's technological advancements.
Pauceanu <i>et al.</i> (2022)	Public university students in the United Arab Emirates.	Questionnaire Survey	Students still don't know what employability skills are required of them under 4IR. The way that students see 4IR employability is not in line with what the UAE job market would need in the future.

References

- Akhter, A., & Sultana, R. (2020). Sustainability of the accounting profession at the age of the Fourth Industrial Revolution. *International Journal of Accounting and Financial Reporting*, 8(4), 139.
- Ayodele, T. O., Oladokun, T. T., & Kajimo-Shakantu, K. (2022). Employability skills of real estate graduates in Nigeria: a skill gap analysis. *Journal of Facilities Management*, 18(3), 297-323. <https://doi.org/10.1108/JFM-04-2020-0027>
- Bryant, K. T. (2021). A Pratica do Agora 2019: um relatório essencial para contadores. <https://www.sage.com/en-gb/blog/practice-of-now/>.
- Damayanti, C. R. (2021). Accounting and its challenges in the new era. Annual *International Conference of Business and Public Administration (AICoBPA 2018)*.
- De Villiers, R. (2021). Seven principles to ensure future-ready accounting graduates - a model for future research and practice. *Meditari Accountancy Research*, 29(6), 1354-1380. <https://doi.org/10.1108/MEDAR-04-2020-0867>
- Engel, C. J. (2021). The Acceptability of Online Degrees in Accounting: A Literature Review. *Global Journal of Business Pedagogy*, 3, 10. <https://link.gale.com/apps/doc/A600448517/AONE?u=anon~2db85d61&sid=googleScholar&xid=016202cf>
- Ferrari, A. (2019). As modernas máquinas-ferramenta digitais determinaram a rápida e fabulosa evolução tecnológica da manufatura. *Obras-Primas da Manufatura/O Mundo da Usinagem*. Jurubatuba - SP, 2019 (120).

- Ghani, E. K., & Muhammad, K. (2021). 4IR: Employers' Expectations of Accounting Graduates and Its Implications on Teaching and Learning Practices. *International Journal of Education and Practice*, 7(1), 19-29.
- Lawson, R. A., Blocher, E. J., Brewer, P. C., Cokins, G., Sorensen, J. E., Stout, D. E., Sundem, G. L., Wolcott, S. K., & Wouters, M. J. (2014). Focusing accounting curricula on students' long-run careers: Recommendations for an integrated competency-based framework for accounting education. *Issues in Accounting Education*, 29(2), 295-317.
- Leitner-Hanetseder, S., Lehner, O. M., Eisl, C., & Forstenlechner, C. (2023). A profession in transition: actors, tasks and roles in AI-based accounting. *Journal of Applied Accounting Research*, 22(3), 539-556. <https://doi.org/10.1108/JAAR-10-2020-0201>
- Li, L. (2022). Education supply chain in the era of 4IR. *Systems Research and Behavioural Science*, 37(4), 579-592.
- Luo, J., Meng, Q., & Cai, Y. (2020). Analysis of the Impact of Artificial Intelligence Application on the Development of the Accounting Industry. *Open Journal of Business and Management*, 6(4), 850-856.
- Maria, M., Shahbodin, F., & Pee, N. C. (2020). Malaysian higher education system towards 4IR - Current trends overview. *AIP Conference Proceedings*, 2016(1), 020081. <https://doi.org/10.1063/1.5055483>
- Moll, J., & Yigitbasioglu, O. (2021). The role of Internet-related technologies in shaping the work of accountants: New directions for accounting research. *The British Accounting Review*, 51(6), 100833.
- O'Connell, B., Carnegie, G., Carter, A. J., De Lange, P., Hancock, P., Helliard, C., & Watty, K. (2017). *Shaping the future of accounting in business education in Australia*. CPA Australia.
- OECD. (2019). *The future of work: OECD employment outlook 2019*. Organisation for Economic Co-operation and Development.
- Stancheva-Todorova, E. (2021). The Knowledge and Skills Profile of Accountant 4.0. 11th International Conference. *Digital Transformation of the Economy and Society: Shaping the Future*. Prilep, North Macedonia.
- Sulong, A., Ibrahim, A. B., Abas, A., & Bakar, A. Z. A. (2023). Incorporating gamification in a flipped classroom approach: A review of the literature. *Jurnal Pendidikan Bitara UPSI*, 14, 22-32.
- Surianti, M. (2022). Development of Accounting Curriculum Model Based on Industrial Revolution Approach. *Development*, 11(2).
- Tektufekci, F. (2021). A Bibliometric Analysis of 4IR-Focused Turkish EAccounting Applications. *Procedia Computer Science*, 158, 602-608.
- Wadan, R., Teuteberg, F., Bensberg, F., & Buscher, G. (2021). Understanding the changing role of the management accountant at the age of 4IR in Germany. *Proceedings of the 52nd Hawaii international conference on system sciences*.
- Wahyuni, T. (2020, 2022). The Role of Information Technology in Supporting the Accountant Profession in the Era of Industrial Revolution 4.0. Proceedings of the 3rd International Conference on Vocational Higher Education (ICVHE 2018),
- Zheng, S. (2021). Financial Management Innovation of Electric Power Enterprises Based on Robotic Process Automation. *3rd International Seminar on Education Innovation and Economic Management (SEIEM 2018)*.