

ACCOUNTING EDUCATORS CHALLENGED BY THE NEW DEMANDS FOR DIGITAL AND SUSTAINABILITY COMPETENCES

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Abstract

Digital revolution and fast emerging technological innovations have recently challenged the accounting professionals with a new role within the organization. Artificial intelligence evolution and the urge for sustainability have brought accountants to the business leadership table. This new status requires them to adapt to the present reality and to capture the newly provided opportunities. Growth mindset and new interdisciplinary skills are vitally needed from the accounting experts nowadays and this is a call for action for accounting educators to calibrate their curricula and syllabi by embedding technologies, data analytics, business strategy and sustainability. The aim of the paper is to analyse the influence of the new competences, demanded from the accounting profession and to bring into focus some of the main development trends in accounting education in light of the new digital reality and the sustainability concerns. To shed light on the new emerging courses, we perform empirical research of several top-rated universities in Europe, USA and Australia and of the programs, delivered by few well-known professional accounting bodies. Our findings reveal that accounting educators have already developed and implemented new courses, related to smart technologies, data applications, sustainability and integrated reporting. Soft skills are also of growing importance for future accountants.

Keywords: sustainability and digital competences, accounting profession, accounting education, new courses

1. INTRODUCTION

Digitalisation and fast ongoing technological innovations have recently become one of the most significant challenges for society and business. Automation processes have driven major changes in the way all types of companies operate. Moreover, business model transformation by the means of digital technologies has nowadays become a key factor in achieving the sustainability goals, set by the United Nations. In particular, for accounting profession all this means extinction of competitive and rule-based tasks from the work agenda. Although the accountancy profession is ranked fourth (with 94% probability) among the occupations susceptible to computerization [1], all these natural processes should be considered a development opportunity for the accounting profession and an upgrading possibility for the accountants themselves. A key role in this upgrading process belongs to the accounting educators, who are challenged to pursue options for further development of employability skills and thus to generate employment-ready graduates [2], who can adapt and reply adequately to the constantly changing business environment. "There's a traditional saying: 'Old accountants never die. They just depreciate'. However, armed with new competencies and a digital mindset, the value that finance professionals bring to their organizations, in a digital world, will now be fully appreciated" [3]

2. LITERATURE REVIEW

The highly digitalized business environment in the last decades has created new skills demands for the accountancy professionals. They should be armed with different and additional skills in order to be able to deal with various information and communication technologies in a way that productivity and efficiency is increased [4]. However, a common conclusion of many researchers and practitioners is that accounting education is not dynamic enough to meet in time the rapid changes, creating an increasing skills gap between how accounting is practiced and what is taught in universities [5]. In the extant literature there are many authors advocating that the future accountant should possess a long list of IT

skills, in the context of transaction automation (software robots, integrated systems, Blockchain technology) as well as an understanding of cloud services and cloud-based systems, programming languages (such as R+, Python, etc.) and Artificial Intelligence (AI)-based algorithms, not to miss the ability to provide cybersecurity [4]. Same authors believe that in times of Big data, Excel and Power Point knowledge should be rather taught in school. For the graduate and undergraduate curricula, they warmly recommend implementation of basic data analytic and cybersecurity courses, since a basic understanding of logic-based machine learning (ML) algorithms, used for predictive and prescriptive analysis would be essential for future professional accountants. And while some authors [6] argue whether it would be less difficult to add Blockchain to a graduate, compared to an undergraduate program due to the already overloaded undergraduate syllabi, others [5] have concluded that technological developments are still a peripheral component in accounting curricula. Meanwhile, in recent research of AICPA&CIMA (2022) results show that as a finance professional progresses through their career, the competency focus moves from pure technical skills to people and leadership skills. This shift is emphasized in the skills gaps that employers and finance functions are experiencing in the recent years. According to the same research these skills gaps are nowadays in three directions: 1) Business partners in terms of business acumen, behaviours and leadership; 2) Data analytics (data modelling and data science); and 3) Business solutions architect (integrating functional and IT solutions). The Global reporting Initiative, founded in 1997 has laid the foundations of the Environment, Society and Governance (ESG) reporting framework. Furthermore, sustainability reporting, which has been accelerated by the adoption of the new Corporate Sustainability Reporting Directive CSRD (EU) 2022/2464, has caused increased interest in sustainability issues among the future students in accounting. It is obvious that their careers may well be influenced in future by the above-mentioned developments [7]. Apart from defining the very skills and the relevant courses, that need to be implemented in undergraduate and graduate accounting curricula, some researchers [5] examined the motivations of the educators for integrating these developments in the accounting curricula. Among the main motivators such as the increased adoption of IT applications by the business, the need to make accountant graduates more employable, the call for fulfilling a specific skill gap, etc. the authors bring the focus to motivators like keeping accounting degrees academically competitive and meeting the exemption requirements of accounting professional bodies. This is a strong implication of the main role of the accounting bodies in the reshaping of the educating curricula in accounting.

This study aims to address a research gap, related to the current status of the accounting graduate and undergraduate curricula. Particularly, it investigates the technological and sustainability developments coverage in terms of the higher requirements, imposed by the new digital reality and the constant pursuit of sustainable future. Main contribution of this research is in providing a comprehensive examination of the accounting education curricula and assessment of how adequately it replies to the current market needs for reskilling. The present study also spotlights the crucial role of the accounting educators, who should stay vigilant for the new emerging competencies demand, in order to continue fostering sufficient employability skills and competences into the future accounting professionals, a topic with serious impact on the future accounting profession.

3. METHODS AND RESULTS

3.1. Methods

The empirical method, used for this research is a content analysis of the syllabi of twenty top-rated universities in Europe, USA and Australia and review of the courses, delivered by four well-known professional accounting bodies. In focus are put the undergraduate and graduate programs in Accounting for the current (2022/2023) and the forthcoming academic year (2023/2024). The performed analysis is aiming to provide information regarding new courses, related to the new skillset, demanded from the accounting professionals. For a better understanding of the developments in the accounting curricula this study addresses a number of research questions:

- Which are the new courses, implemented in the university accounting education in reply to the new demands to the accounting profession?

- Which are the key competences, that accounting educators aim to foster in the accounting profession graduates via the new courses?
- Which are the courses in focus of the accounting bodies in the process of accounting education reshaping?

3.2. Which are the new courses, implemented in the university accounting education in reply to the new demands to the accounting profession?

Content analysis of the Accounting syllabi shows that the undergraduate programs of eight out of twenty universities and the graduate programs of thirteen out of twenty examined universities are providing new courses, related to the evolution of new digital management solutions, as well as governance of environmental and corporate sustainability. When we deep dive into the syllabi of the undergraduate accounting programs (Table 1.) we find a number of courses such as Introduction to programming, Innovation and Technology, Data Science, Database accounting systems, Enterprise and Accounting systems.

Table 1. New Courses in Undergraduate Accounting Programs

UNIVERSITY	COURSE
London School of Economics and Political Science	Corporate Governance, Risk Management and Financial Audit Organizational Behaviour and Leadership Sustainable Development Information Systems Programming for Data Science Innovation and Technology Management Sustainable Business and Finance Accounting, Corporate Responsibility and Sustainability
King's College London	Introduction to Programming Organizational Behaviour Business Ethics & Sustainability Innovative Technologies, Accounting and Finance Technology & Innovations
University of Warwick	Leading Sustainability transitions
Stockholm University of Economics	Global Challenges Sustainability Challenges: Business in Society Data Science for Business Data Analytics
University of Illinois, Chicago	Accounting information systems Database accounting systems Enterprise accounting systems Ethical Environment of Business.

University of Pennsylvania, Wharton school	Climate and Financial Markets
Durham University Business School	Business and Technology
Golden Gate University	Accounting Information Systems
University of Melbourne	Sustainable Commerce

Main subject areas in these courses include information system development, AI, ML, Big data, computer programming (with a focus on Python programming language), principles of designing database systems and implementation of computerized accounting systems, etc. Another focus area in the undergraduate accounting syllabi is addressing the critical sustainability challenges in terms of environmental concerns, social issues and business governance. Among the so-called sustainability courses we can recognize Sustainable development, Sustainable Business and Finance, Corporate governance and Risk Management, Climate and Financial markets, Global Challenges, etc. The main idea behind these courses seems to be the exploration of the relationship between the current human development and the future sustainable environment. Principle topics here are the hedging of climate risks, investigation of the benefits of ESG reporting and its regulation and the impact of greenwashing. The importance of sustainable supply chains, diversity management and the significance of developing purpose-led business are also in the scope of these new sustainability courses. Although not so exceeding, there are a few new courses (Organizational Behaviour and leadership, Business Ethics, Ethical Environment of Business), introducing social science theories, human behaviour understanding, ethics, managerial decision-making process, multinational workplace, etc, that would teach students in soft skills.

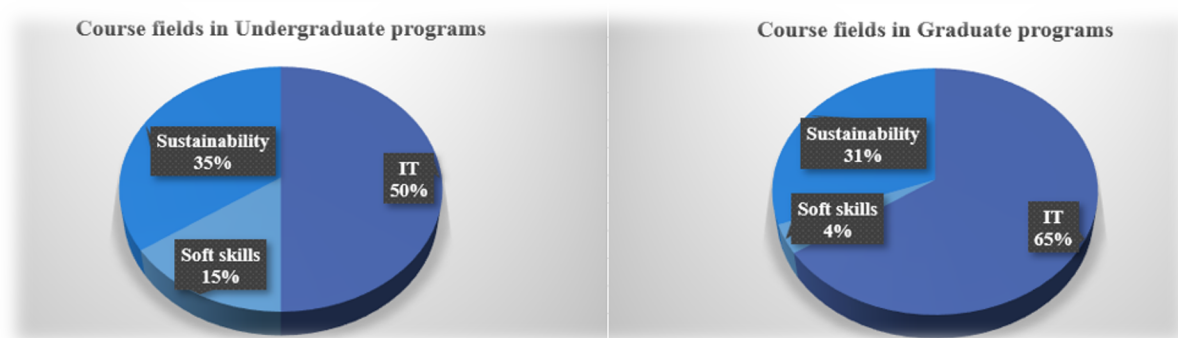


Fig. 1. New Course Fields in the Undergraduate and Graduate Accounting Programs

We figure out that in thirteen out of twenty universities there are new courses in IT, sustainability and soft skills area for the graduate programs in Accounting, compared to nine out of twenty universities for the undergraduate programs. Furthermore, when we perform a comparison between the graduate and the undergraduate programs we find out that the IT courses in the undergraduate programs are half of the new curricula courses, while in the graduate programs they are 15% more. Sustainability courses seem to be almost equally presented, slightly prevailing in the undergraduate programs. Finally, the soft skills courses are representing 15% of the new courses in the undergraduate programs, which is 11% more than the same course area in the graduate programs. (Fig. 1)

An important aspect of the research is the examination of how the new courses are presented in the different programs in terms of obligation. (Fig. 2). The finding that some of the elective courses in the undergraduate programs become obligatory for the graduates could be quite relevantly expected. For example, at the University of Illinois the elective courses of Database Accounting Systems, Enterprise

Accounting systems and Ethical Environment of Business in the undergraduate program become main subjects in the graduate program of Accounting.

Another important finding is that only in five out of twenty universities new courses are taught both in undergraduate and graduate programs. In those universities IT, sustainability and soft skills courses are predominantly elective in the undergraduate programs and obligatory in the graduate programs. In the rest of the examined universities new courses are taught either in the undergraduate programs or in the graduate ones. In that second group of universities the new courses are mainly obligatory in the undergraduate programs and mostly elective in the graduate programs. IT courses are very well presented as main subjects in both graduate and undergraduate programs and also there is a variety of them among the electives rather in the graduate than in the undergraduate programs of Accounting. Sustainability courses seem to be equally appearing in both programs, but less prevailing than the IT courses. Soft skills courses are set as main subjects in only two out of twenty universities and as elective in the undergraduate programs of another two universities. They are not emerging as electives in the graduate programs of the examined universities.

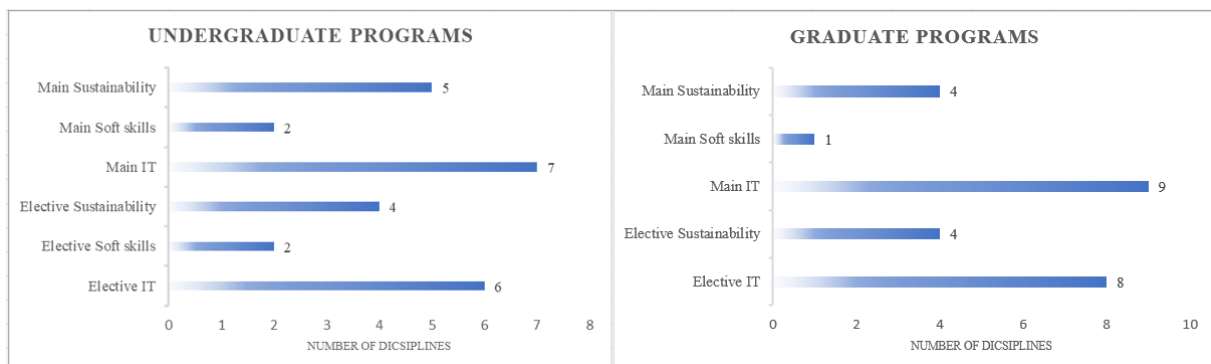


Fig. 2. Main and Elective Courses in Undergraduate and Graduate Accounting Programs

3.3. Which are the key competences, that accounting educators aim to foster in the accounting profession graduates via the new courses?

If we summarize contents of the new examined courses, that have been recently added to the accounting curricula, we could divide into three groups the competences they aim to develop in the students from graduate and undergraduate programs (Table 2.)

Table 2. Key competences to be fostered in the accounting profession graduates via the new courses in the accounting curricula

Digital skills	Sustainability competences	Soft skills
Using information technologies	Climate change risk management	Communication skills
Application of information skills	Sustainability impact understanding and analysis	Equity and inclusion
Application of numerical skills	Risk management	Time management
Data analysis and interpretation	Leadership skills	Lifelong learning
Critical analysis and understanding	Critical thinking	Relationship management
Programming languages	Decision making	Empathy

Understanding of integrated ERP systems Ability to identify automation potential Knowledge to automate processes Advanced user skills in using BI tools Knowledge to understand AI-algorithms Data and Cybersecurity Risk management Problem solving Project management	In-depth understanding of sustainability Non-financial and sustainability reporting skills Active understanding Research skills	Active listening Ability to influence Team work
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These are the digital skills, sustainability competencies and last but not least – the soft skills. The group of the digital skills combines basic digital literacy and a deeper technology know-how. Basic digital literacy is the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent jobs and entrepreneurship [9]. These are the skills for using IT, application of numerical skills, understanding of ERP systems, data analysis and interpretation, etc. On the other hand, among the deeper technology know-how we can recognize skills like programming languages, advanced user skills for BI tools, data and cybersecurity, etc.

Research results suggest that the sustainability competences, aimed to be developed by the new courses in the accounting curricula, could also be divided into basic sustainability knowledge (ability to recognize climate change risks, critical thinking, active understanding, research skills) and a more in-depth proficiency in sustainability reporting. Among the soft skills, aimed to be fostered we see communication skills, empathy, lifelong learning, etc. Yet, in the stated digital and sustainability competences we see some soft skills. For example, problem solving in digital world is a key ability that supplements the rest digital competences to be mediated and applied. Critical thinking, active understanding and professional scepticism are crucial for providing a comprehensive and informative sustainability analysis.

3.4. Which are the courses in focus for the accounting bodies in the process of accounting education reshaping?

Our survey findings imply that the accounting bodies have implemented the new key areas of accounting education in their syllabi, which require from future qualified professionals to develop IT, sustainability and ethics knowledge and competences. For example, in the membership exam courses of ACCA, right before the Strategic Professional Exams there is an Ethics and Professional Skills module, which is an interactive online module, placing students in realistic business situations, where they can develop advanced ethical, professional and digital skills. Among the aspects of the Strategic Business Reporting syllabi there are three new examinable areas such as accounting for digital assets, the impact of climate change on corporate reporting and nonfinancial reporting, which includes sustainability and integrated reporting. In the Strategic Business Leader study guide we can see learning outcomes such as information technology and data analysis to be used in implementation of organization strategy or describing of Big data and discussion of the opportunities and threats Big data presents to organizations. The Advanced Audit and Assurance syllabus includes learning outcomes like the use of data analytics

and current developments in emerging technologies in auditing and their impact over audit quality. Apart from the membership exam modules, ACCA is offering a number of courses for certification in Data Analytics, Digital Innovation for Finance, for Integrated reporting and Sustainability Finance, etc. In the syllabi for CPA Australia, one of the four compulsory membership courses is Ethics and Governance, aiming to provide proficient accountants with analytical skills and knowledge of ethics, corporate behaviour, governance mechanisms, compliance requirements, etc. Among the electives in the same syllabi there is a Digital finance, which examines technology and its use in finance, data analytics, interpretation and visualisation, as well as risk management, governance and regulation. In the Operational level of CIMA there is an exam in Managing Finance in a Digital World, which is focused on digital technologies, data information in finance function. In Strategic level, one of the exams in Strategic Management includes Digital strategy, Risk Management and cyber risk. In CIMA they are also offering an application of data analysis certificates. ACA qualification in ICAEW requires an exam in Business, Technology and Finance in its Certificate level and an exam in Business Strategy and Technology in its Professional level. It is important to mention that ICAEW Code of Ethics is integrated in all of the 15 member exams.

4. DISCUSSION

Accounting is a very complicated scientific area and its education curricula is traditionally overloaded with specific courses, educating students in basic and advanced professional knowledge and techniques. When it comes to new courses, which are related to different scientific areas like IT, sustainability or ethics, educators are being challenged on how to implement them in the already overcrowded accounting syllabi [8]. This challenge is explicitly crystallizing in the results of this survey. Undoubtedly, the clear message, implied by the companies through their adjusted demand for IT and sustainability literate accountants has been accepted by the educators and they have already started to adapt and enrich the accounting curricula by embedding the needed reskilling courses. Results from the performed research have led us to a number of findings.

Our survey indicates that the IT courses in the examined graduate programs are not only exceeding in number compared to the same courses in the undergraduate programs, but also seems that they are more complex and advanced. Courses such as Data Mining, Python programming, No code data science, Introductory Applied ML provide knowledge in programming languages and also educate students to practically manipulate the new innovative technologies to their full capacity. This would prepare them to be able to apply predictive analytics, which is so important for improvement of company decision-making process. Similarly, the sustainability courses in the graduate accounting programs aim to provide students with more complex knowledge and practical capability of critical evaluation of sustainability. Other courses like Environmental economics, Sustainability reporting and management, Sustainable Finance and Impact investing are meant to allow graduate students in Accounting to master the theories, principles, and practices of sustainable finance and the related ESG issues, to develop a broad understanding of the sustainability reporting framework. Since the soft skills courses are outnumbered in the undergraduate accounting programs, it could be an implication that the soft skills should be studied in the undergraduate programs rather than in the graduate ones. At least for the time being educators' attention in the graduate programs is less focused on the soft skills courses.

Another research finding is that due to the fast digital and automation development, technical knowledge and skills have become a must for professional accountants. This is the reason why the new IT courses are not predominant only by number, but also in terms of obligation in the contemporary accounting curricula. On the other hand, sustainability reporting regulations are inevitably changing the reporting, which is the main outcome, produced by the accountants; thus, sustainability courses are more and more implemented in the accounting curricula as main and obligatory courses. Although still with a slower pace than the IT courses, we claim that sustainability courses trend to have a stronger effect over the accounting education in the next years, considering that the European Sustainability Reporting Standards have just been announced.

Survey results prove that digital and sustainability competencies growing demand has affected accounting curricula. The number of IT and sustainability courses is rapidly growing in the educator's agenda; moreover, we see that even emerging slowly, there are few new courses focused on ethics and soft skills in accounting curricula. Professional ethics in the traditional accounting profession is a must, but the new digital environment and the urge for sustainability have given a new more complex meaning to professional mindset and ethical behaviour. The ability to adapt complexity of the new digital reality, to be creative, agile and influential, to be an active listener and a team player, to keep a permanent curiosity and to devote to lifelong learning are the soft skills that become more and more important for the accounting professionals. The reason for the sporadic and rather recommendable than obligatory nature of the soft skills courses in the accounting curricula could be that the outcomes of soft skills teaching are difficult to be measured and the educators are hesitant to either teach them or implement them in the curricula at all [8]. Nevertheless, we claim that the new soft skills courses have a very important role in terms of fostering a growth mindset in the future accounting profession graduates, "because the pace of change is shortening the shelf life of learned knowledge" [3]

The capability to understand digital technologies, to apply different technological tools and to create digital data analysis seem to be basic digital skills, which future accountants should possess in order to be employable. While, a deeper level of digital expertise encompasses knowledge in AI-algorithms and programming languages, ability to automate processes, as well as advanced usage of different BI tools. These are all competences, which would make the future accountants very competitive in a job interview. Sustainability knowledge, aimed to be developed by the new courses in the accounting curricula, could also be divided into basic sustainability knowledge and a more in-depth proficiency in sustainability reporting. Nowadays it is very important for an accountant to understand the origin and the purpose of the sustainability idea. To be sensible and knowledgeable of climate change, social equality and corporate governance requires development of skills, different from the traditional accounting capabilities. Yet, it is a basic knowledge to recognize the urgency of social and environmental problems and their impact on society and business, to understand the complex relationship between human lives and the environment, and how this affects our everyday lives and our future. Given the rapid developments in the area of sustainability reporting it is reasonable that the educators have already started enabling students to master the theories, principles, and practices of sustainable finance, so that they can develop expertise to critically analyse sustainability risks and impact, to be proficient to measure and report it. In this way accounting profession graduates will be prepared for the sustainability reporting challenges, that we claim will definitely impact their future careers. This is another proof for the adequate response of the educators to the strong reskilling demands of the present.

Professional accounting bodies have always played a significant role in accounting education through their accreditation requirements. The preformed research is suggesting that their membership exam curricula is very much influenced by and adjusted to the new demands for digital knowledge, sustainability competences and soft skills for the future accounting professionals. Main focus of this research is on the syllabi of twenty top-rated universities with long traditions in accounting education and survey results imply that they are successfully responding the reskilling demands. Meanwhile, there is a great number of other universities worldwide, whose syllabi are still not adapted to the new employability requirements. However, many of them are partnering with the accounting bodies and are providing their courses via different accredited programs. Thus, the accounting educators are following the professional bodies' curricula and the students are motivated to study the new courses in order to get an accredited professional diploma. Although, some authors claim that in this way accounting bodies play a hegemonic inhibiting role in accounting education through accreditation requirement [5], we argue that accounting bodies influence quite positively the reshaping process of the accounting education.

It is a common observation that the implementation of new skills or new courses into the accounting curricula is very complicated process either because of the traditionally overcrowded accounting programs or because the educators are not feeling enough prepared for the new challenges. Another concern is the need for deployment of specific strategies for building students' capacity to develop the new employability skills [10]. Nevertheless, a new interdisciplinary approach needs to be applied across

the accounting curricula. The new IT, sustainability and soft skills courses should be considered as a must not just a desirable competitive advantage and in that sense accounting educators are responsible for the timely response [11].

5. CONCLUSIONS

The provided research findings imply that the challenge of new demands for digital and sustainability competences have been embraced by accounting educators. The examined top-rated universities have already started adapting their curricula to respond adequately to the needs for reskilling. New courses in technology, sustainability and ethics have been added to the undergraduate and graduate courses in accounting. In order to provide students with employable competences, educators should keep on improving their curricula, so that it is up-to-date with the new trends and demands, but not too overwhelming and demotivating. A better co-operation with practitioners and professional bodies would give the opportunity to educators to make periodic revisions of their syllabi and to stay alert for new emerging demands and thus to continue fostering adequate employability skills and knowledge into the future accounting professionals. However, short expiry date of nowadays competencies demands requires that the most important role for educators should be to nourish future graduate accountants with growth mindset and a lifelong learning attitude, because as Isaac Asimov says “Education isn’t something you can finish”.

REFERENCES

1. Frey, C. B., & Osborne, M. A. (2017). The future of employment: how susceptible are jobs to computerization? *Technological Forecasting and Social Change*, 114, 254-280;
2. Stoner, G. and Milner, M. (2010) Embedding generic employability skills in an accounting degree: development and impediments. *Accounting Education: An International Journal*;
3. AICPA&CIMA, Re-inventing finance for a digital world, Nov 30, 2022;
4. Leitner-Hanetseder, Lehner, Eisl, & Forstenlechner, 2021, Need for advanced IT skills for accountants – What does accounting education literature tell us?;
5. Kotb, A., Abdel-Kader, M., Allam, A., Halabi, H., & Franklin, E. (2019) “Information technology in the British and Irish undergraduate accounting degrees,” *Accounting Education*, vol. 28(5), p. 445-464;
6. Felski, E. A., & Empey, T. B. (2020) “Should Blockchain be added to the Accounting Curriculum? Evidence from a Survey of Students, Professionals and Academics,” *The Accounting Educators’ Journal*;
7. Bakarich, K., (2022), Integrating Sustainability Concepts into an Intermediate Accounting Course, *THE ACCOUNTING EDUCATORS’ JOURNAL* Volume XXXII;
8. England, T.K., Blix, L.H., Carrington, L.G., Harris, K.L. A Framework for Teaching Soft Skills and Ethics in an Overcrowded Accounting Curriculum, *THE ACCOUNTING EDUCATORS’ JOURNAL*, Volume XXXII, 2022, pp. 205 – 234
9. UNESCO Institute for Statistics (2018), A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2 <https://unesdoc.unesco.org/ark:/48223/pf0000265403.locale=en>
10. Stoner, G. and Milner, M. (2010) Embedding generic employability skills in an accounting degree: development and impediments. *Accounting Education: An International Journal*. 19(1/2), 123-138.
11. Stancheva-Todorova, E. (2019) Accounting educators and practitioners on alert – the time for bigger and constant changes has come! <https://www.cceol.com/search/chapter-detail?id=787277>