University Accounting Curriculum, IT, and Job Market Demands: Evidence From Yemen

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Abstract

University education in different countries, including Yemen, has the burden of providing the proper supply that meets the job market demands, including information technology (IT). In the accounting education context, the qualification of students to the job market regarding IT is still one of the notable issues that seem to have been overlooked in many of the curricula of most universities. This study utilizes the Yemeni context to identify and evaluate the current status of accounting education at Yemeni universities. It mainly focuses on (a) whether the current accounting curriculum meets the job market demands regarding IT and (b) whether the inclusion of relevant IT in the accounting curriculum meets the job market demands. To achieve this, the current accounting curriculum of Yemeni universities was analyzed, and a questionnaire survey was administrated to a large sample of practitioners and newly graduated students. The study provides evidence that the current university accounting curriculum is not in line with market expectations regarding IT due to the full focus on theoretical aspects. The study further confirms that the inclusion of relevant IT in the accounting curriculum could meet the job market demands of IT. The questions related to relevant IT subjects desired in practitioners and newly graduated students showed that general computer skills (e.g., Windows, internet, spreadsheets) were the most desired followed by accounting software, Excel software applications in accounting, E-commerce, and communications software (e.g., Outlook), respectively. The study findings have implications for Yemeni professional accounting bodies, accounting instructors and students, and researchers.

Keywords

accounting curriculum, IT, market demands, accounting education, Yemen

Introduction

University education in different countries, including Yemen, has the burden of providing the proper supply that meets the job market demands. Accountants face challenges in the current business environment, requiring teachers’ attention (El-Dalahmeh, 2017; Fouché, 2013; Hearn, 1984; Hiramatsu, 2018; Lee et al., 2018).

The job market demands are many. However, they can be divided into theoretical and technical demands; both these demands are important in the job market. Theoretical demands are skills such as key accounting skills (Ainsworth, 2001; Jackling & De Lange, 2009; Kavanagh & Drennan, 2008), problem analysis and solving (Jackling & De Lange, 2009; Stoner, 2009; Wessels, 2005), communication skills (Awayiga et al., 2010; Jackling & De Lange, 2009), and ethics (Bain et al., 2002; Jackling & De Lange, 2009; Kavanagh & Drennan, 2008; Wessels, 2005). Although the focus on the theoretical aspects of the accounting curriculum is important, this is not enough to prepare students to enter the job market (Yucel et al., 2012). Besides the theoretical aspects, employers mostly presume that graduates gain the requisite technology skills while undergoing the curricula of their colleges (Senan, 2019).

In the job market, the forces of technology changed many professions, including the accountancy profession (Pincus et al., 2017). Manual theoretical accounting has become rare, as it has changed and transformed into automated accounting (Wessels, 2004). Information technology (IT) in accounting has become a daily routine, as most of the accounting and financial operations can no longer be performed without sharing of IT (Damasiotis et al., 2015). Many accounting practice aspects have been essentially changed through IT.

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The role of the accountant was expanded and became more complex as the IT progressed (Chayeb & Best, 2005). The ledger, handwritten financial statements, and hard tables data all were translated into the computer. This has resulted in significant savings in time and cost. However, the qualification of students to the job market is still one of the notable issues that seem to be overlooked in many of the curricula for most universities. This makes a big difference from the perspective of accounting and management graduates of those universities or colleges.

The literature consistently indicates that graduates who move to the workplace do not have sufficient skills, due to current accounting education practices (Fouché, 2013). Accounting education has been criticized over the last two decades for not meeting the demands of a changing business environment (Awayiga et al., 2010). Furthermore, professional accountancy bodies (American Accounting Association, Committee on the Future Structure and Content and Scope of Accounting Education [The Bedford Committee], 1986; American Institute of Certified Public Accountants [AICPA], CPA Vision Project: Focus on the Horizon, 1998; Institute of Management Accountants, 1999) and employers alike have criticized accounting programs for failing to provide graduates with the modern technological competencies in the changing business environment (Bui & Porter, 2010).

In addition, many studies have been conducted (in different environments and countries) to search the extent to which accounting education is keeping up with the job market demands: for example, in Britain (Ahmed, 2003), the United States (Albrecht & Sack, 2000; Chang & Hwang, 2003), the United Kingdom and the Republic of Ireland (Kotb et al., 2018), Brazil and Portugal (Riccio & Gramacho Sakata, 2002), South Africa (Fouché, 2013; Wessels, 2004), Australia (De Lange et al., 2006; Kavanagh & Drennan, 2008; P. Pan & Perera, 2012; Seethamraju, 2010; Watty et al., 2016), Greece (Matlay et al., 2014), Romania (Nicolescu & P[acaron]jun, 2009), Canada (Boulianne, 2016), New Zealand (T. Tam, 2013; T. C. W. Tam, 2011; Wells, 2018), Ghana (Awayiga et al., 2010; Ayeboaf, 2012), Malaysia (Lai, 2008), Indonesia (Pratama, 2015), Turkey (Yucel et al., 2012), Lebanon (Majzoub & Aga, 2015), Egypt (Anis, 2017; Nokhal, 2013), Saudi Arabia (Senan, 2019; Srدار, 2017; Zureigat, 2015), and Jordan (El-Dalahmeh, 2017; Maali & Al-Attar, 2020). The studies have urged the need to develop critical solutions to address the weaknesses of the accounting curricula, especially relating to IT. They also stressed the need to rely on international education standards (IES) in the development of accounting education worldwide (Hiramatsu, 2018; Saville, 2007; Sugahara & Wilson, 2013). Meanwhile, other studies have called for the necessity to integrate relevant IT subjects into the accounting curriculum (AICPA, 2010; Al-Khadash & Al-Beshtawi, 2009; Awayiga et al., 2010; Boyce, 1999; Burnett, 2003; J. Chen et al., 2009; Greenstein & McKee, 2004; Hermanson et al., 1999; International Federation of Accounting [IFAC], 1999; Kotb et al., 2019; G. Pan & Seow, 2016; Sledgianowski et al., 2017; Stoner, 2009; Warren, 1999; Wessels, 2005).

In Yemen, no related study has been conducted. Hence, this study attempts to identify and evaluate the current status of accounting education in Yemen. It mainly aims to verify (a) whether the current accounting curriculum meets the job market demands regarding IT and (b) whether the inclusion of relevant IT in the accounting curriculum meets the job market demands.

This article adds to the accounting education literature, as it discusses an interesting topic that has not yet been investigated in the context of Yemen. The second contribution relates to the method of analysis and data collection for this study. Past studies usually take graduate students as a proxy for the market (e.g., Carr et al., 2006; De Lange et al., 2006; Kavanagh & Drennan, 2008), or focus on the views of the current accounting students (e.g., Al-Khadash & Al-Beshtawi, 2009; Lai, 2008; Laing & Perrin, 2012), or academics and professionals (e.g., Kotb et al., 2019; Maali & Al-Attar, 2020), or provide literature reviews on market demand for graduates of accounting (e.g., Howieson, 2003; Mohamed & Lashine, 2003). Although a limited number of studies have obtained opinions from practitioners about the status of accounting education or curriculum, the sample sizes of those studies are comparatively small, and the opinions of newly graduated students are not taken into consideration (e.g., Lee et al., 2018; Pratama, 2015; T. C. W. Tam, 2011). Besides the analysis of contents of the current accounting curriculum in Yemeni universities, data for this study were gathered from more than 400 practitioners and newly graduated students such as those who have greater knowledge on the job market demands. The desire to reform accounting education usually comes from the market (T. T. Chen, 2014).

This article is divided into seven sections. The “Related Literature” section discusses the literature. The “Education in Yemen” section highlights education in Yemen. The “Method” section identifies the methodology. The section “Results and Discussion” clarifies the results and discussion. The “Limitations and Further Research” section mentions the limitations of this article and scope for further research. Finally, the “Conclusion” section summarizes the conclusions.

Related Literature

One of the major goals of accounting education is to assist students to learn to become professional accountants. Teachers often should mix theory with practice (why and how; Persson, 2016). The controversy over accounting education at universities has revealed a prevailing view that what we teach in accounting needs to change—that is, it should be more relevant to students' needs, as identified by employers and professional accounting bodies (McCombie, 2007). There is a gap between IT skills that students are
currently learning in university-level accounting education and what the real-world accountants’ practice (Ahmed, 2003; Albrecht & Sack, 2000; Ayeboafo, 2012; Diller-Haas, 2004; Watty et al., 2016). Theoretical education alone is insufficient to adapt students to the changing environment (Lowden et al., 2011). Mohamed and Lashine (2003) state that the slow changes in the curriculum are the cause of the gap between the skills acquired and those required from accountants in the job market. Moreover, Greenstein and McKee (2004) and Nearon (2002) report that if accounting institutions continue using conventional teaching means in accounting education, the inevitable outcome will be the failure in, or the possible demise of, accounting education.

IT changes are widespread; they increasingly affect businesses as a whole, as well as business processes particularly. Therefore, besides manual systems, the accountant needs to understand the procedures of IT systems (IFAC, 2006). Most companies and institutions depend heavily on computer software capable of processing financial transactions electronically and providing users with the data and information they need quickly and accurately. The use of IT resources allows companies to maintain a competitive edge over their competitors as well (Kermani, 2013). Accounting graduates who have knowledge and skills in the IT field would have better job opportunities (Boritz, 1999; Kotb et al., 2018; Pincus et al., 2017; Stoner, 2009; T. Tam, 2013). Looking at the unique nature of the digital economy, it is critical that accounting graduates understand how technology is changing the area in which they are expected to work. Failure to address such changes in the accounting curriculum decreases the accounting graduates’ employability and work-readiness (Kotb et al., 2019). Thus, the accountant needs to be prepared to deal with this technology, starting from the stage of education until the practice of accounting work.

IT is determined as one of the most important skills that accounting graduates should POSSESS (Maali & Al-Attar, 2020). Accountants should have the required IT skills so that they can efficiently use information systems (IS) and technology to perform their various functions as accountants (including financial reports, taxes, management accounting, and auditing; El-Dalahmeh, 2017; Wessels, 2005). IFAC defines IT proficiency as a mandatory requirement for accountants and auditors. They have to increase their scientific and practical ability to understand the requirements of applying modern accounting and auditing techniques to use them perfectly. Also, IFAC (2003) recommended that the accounting education system should be flexible and capable of keeping pace with different environmental changes and developments. Curricula should also be reviewed and developed continuously in line with these developments. Furthermore, IFAC (1999) called for the introduction of technical means and IS into the accounting curricula. J. Chen et al. (2009) reported that so as to adapt the accountants to the evolving information environment, relevant IT subjects must be integrated into the core subjects of traditional accounting. AICPA (2010) indicated that “Individuals entering the accounting profession must acquire the necessary skills to use technology tools effectively and efficiently.” Howieson (2003) said it is necessary that students understand the role of accountants as counselors who require skills in utilizing IT. Braun (2004) concluded that along with developing the skills needed to handle the information, it is necessary to assess the level of graduates consistently.

Overall, continuous IT shifts make education in IT more demanding in terms of know-how and preparation. The accountant profile is one having both accounting and IT education (Boulianne, 2016). Hence, IT usage in accounting education should be part of the development of the accounting system, both academically and professionally, and teachers should focus more on the importance of IT (Srdar, 2017). For producing accounting graduates, who are more adapted to developments in modern business environments, Wessels (2005) and Awayiga et al (2010) propose that accounting students need to master some technologies such as computer skills (e.g., Windows, internet, word processing, spreadsheets), e-commerce, communications software, and accounting packages.

**Education in Yemen**

The duration of university education in Yemen for most disciplines including accounting is 4 years. There are about 10 public universities (Sana’a, Hodeidah, Aden, Taiz, Dhamar, Ibb, Hadramawt, Emran, Hajja, and Albayda) and a number of community colleges. There are also some private universities scattered throughout the country. Both public and private Yemeni universities provide most types of education and specialties such as engineering, medicine, computer science, management sciences, languages, law, and so on. All programs such as diplomas, bachelor’s, master’s, and doctorates are provided at these universities.

The Yemeni government has set a strategic vision for Yemen in 2000, for 25 years (until 2025). It aims at improving education chances for all Yemenis, decreasing illiteracy, and reaching, at least, medium-development countries level. Here are some of the important related goals that the strategic vision aims to attain (Al-Joufi, 2008):

1. Making a complete change in the education system (structure and curriculum) to be in line with technology, science, and the development of needs.
2. Transporting the basics of technology and science according to the following:
   (a) Set a patriotic strategy for science and technology.
   (b) Give special attention to raising and broadening the foundations of training and education.
   (c) Raise the responsiveness of university education to the needs of society, in keeping with the developments and the era challenges.
In 2001, the Ministry of Higher Education and Scientific Research in Yemen was established for meeting the demand of social development. Also, the Yemeni government worked in cooperation with governments of Netherlands, the United Kingdom, and Germany, as well as with different organizations (such as the World Bank, Canadian International Development Agency [CIDA], and U.K. Department for International Development [DFID]) for making significant improvements to all levels of the education system, including university education (The World Bank, 2008).

Despite considerable investment at this level, Yemen’s higher education still has a long way to run. Learning sources and equipment are poor; there is no systematic process of revising and updating the curricula (Higher Education Project II, 2008). Moreover, Yemeni universities still utilized traditional methods of teaching and learning. They are not suitable for e-content and not compatible with any new upcoming (Aldowah et al., 2015).

An overview of the reality of accounting education in Yemen:

1. Accounting education is practiced in Yemen after secondary school. There is also a branch of commercial education in the secondary stage.
2. Secondary stage graduates (scientific, literary, and commercial branches) shall be admitted in public and private colleges and universities.
3. The study period is 4 years. The student is then granted a bachelor’s degree in accounting sciences which qualifies him to work in the field of accounting.
4. There are not enough areas for postgraduate studies within the institutions of higher education in Yemen as the number of universities that grant a master’s degree is very limited. And the Yemeni universities generally do not grant a doctorate degree in accounting leading to the lack of qualified accounting cadres.

### Method

The current study is descriptive in nature. According to Levac et al. (2010), the descriptive analytical approach is utilized to extract contextual or practical information. This study mainly seeks to answer (a) whether the current accounting curriculum meets the job market demands regarding IT and (b) whether the inclusion of relevant IT in the accounting curriculum meets the job market demands. For this purpose, the article relied on a general analysis of the accounting curriculum for Yemeni universities. The study plans adopted for the accounting curriculum year 2017–2018 were analyzed. The study plans were tracked from 2010 to 2018, and it turned out that there is no significant change in the plans. Therefore, the latest academic year was taken. The second stage was to construct a questionnaire with closed questions to investigate the practitioners and newly graduated students’ perceptions. Questionnaires offer a relatively inexpensive, speed, and effective way to obtain large information amounts from a large sample of people (McLeod, 2018). This questionnaire was prepared to reflect the visions of practitioners and newly graduated students to enrich the research with their opinions and observations. This questionnaire comprises two parts. The first part pertains to the demographic characteristics of the respondents, while the second concerns the perceptions of practitioners and newly graduated students. Based on an extensive literature review (Awayiga et al., 2010; Bain et al., 2002; Burnett, 2003; Glover & Werner, 2015; Greenstein & McKee, 2004; Jackling & De Lange, 2009; Kavanagh & Drennan, 2008; Lee et al., 2018, 2019; Nicolescu & Pacaron, 2009; Ramachandran Rackliffe & Ragland, 2016; Sithole, 2015; Stoner, 2009; Wessels, 2005; Zureigat, 2015), the questionnaire’s items/questions were listed (see the appendix). Respondents for this study were chosen on the basis that they had graduated with a Bachelor of Management Science Degree majoring in Accounting and Business Administration and between the years 2010 and 2018. About 715 questionnaires were randomly distributed to the category of practitioners currently working in a number of organizations and industries and newly graduated students in seven Yemeni universities. Out of which, 555 were retrieved (i.e., 77.6% response rate) and 56 were excluded for being incomplete. Only 499 valid questionnaires were analyzed. Newman and McNeil (1998) reported that when the sample is selected randomly, and the sample size ranges from 300 to 400, it is easier to generalize the results. To score replies, “Yes” or “No” questions were used in addition to the Likert-type 5-point scale (from 1 = strongly disagree to 5 = strongly agree). The questionnaire responses were analyzed using SPSS. All the necessary descriptive statistics were performed and the level of reliability was determined. To confirm the results, a one-sample t test was conducted using three as a test value (Table 1).

### Results and Discussion

#### General Analysis of the Accounting Education Curriculum in Yemeni Universities

To assess the quality of accounting education, the researcher chose a sample consisting of six Yemeni universities (four public, two private). The sample universities were selected based on their diversity in terms of the size

| Average | Level     | Rank     |
|---------|-----------|----------|
| 1.00 ≤ M ≤ 1.80 | Strongly disagree | Very low |
| 1.81 ≤ M ≤ 2.60 | Disagree | Low     |
| 2.61 ≤ M ≤ 3.40 | Neutral | Medium  |
| 3.41 ≤ M ≤ 4.20 | Agree | High    |
| 4.21 ≤ M ≤ 5.00 | Strongly agree | Very high |

Table 1. Average Score of 5-Point Likert-Type Scale.
of students and the nature of their government or private funding. Through this sample, the researcher went deeper into the review and verification of accounting curricula. After research and evaluation, it was noted that almost all universities of the sample adopt a standardized curriculum (see Table 2).

It is noted from Table 2 that all accounting subjects of accounting curriculum are taught as a traditional theoretical aspect, including Accounting Information Systems (AIS) and computer principles. Although the focus on the theoretical aspects of the accounting curriculum is important, this is not enough to prepare students to enter the job market (Yucel et al., 2012). In addition, there is a complete absence of including relevant IT subjects in the current accounting curriculum. This does not keep pace with the practical reality that heavily relies on IT and accounting software (AICPA, 2010; Al-Khadash & Al-Beshtawi, 2009; Awayiga et al., 2010; Boyce, 1999; Burnett, 2003; J. Chen et al., 2009; Greenstein & McKee, 2004; Kotb et al., 2019; G. Pan & Seow, 2016; Stoner, 2009; Warren, 1999; Wessels, 2005). For an in-depth analysis, it is also better to compare this curriculum with IES (International Accounting Education Standards Board [IAESB], 2010).

The extent to which the accounting education program in Yemeni universities complies with IES. The IES were released by the IAESB to attain overall quality and consistency of global accounting education (Sugahara & Wilson, 2013). These standards of education have been set to enhance the quality of accounting education worldwide (Hiramatsu, 2018; Saville, 2007). There are presently eight IES (see Table 3).

To analyze gaps in the accounting curriculum compared with IES, the research focused on IES2 as this standard is more related to accounting education programs at universities.

IES2: Content of professional accounting education programs. This standard clarifies the minimum subjects that should be covered by the accounting education program and identifies the knowledge and competencies necessary for the accountant work. As stated in this standard, the accounting education program should cover three components: (a) accounting, finance, and related knowledge; (b) organizational and business knowledge; and (c) knowledge and competencies in IT (IAESB, 2010). The first component should comprise the following subjects: financial accounting and reporting, management accounting and control, business and commercial law, taxation, audit and assurance, finance and financial management, and professional values and ethics. The second component should comprise the following subjects: economics, business environment, business ethics, corporate governance, financial markets, organizational behavior, management and strategic decision making, quantitative methods, marketing, and international business and globalization. The third component should comprise the following subjects: general knowledge of IT, knowledge of IT control, competencies of IT control, IT user competences, and the roles of manager, evaluator, or designer of IS.

The comparison results in Table 4 indicate that the accounting curriculum in Yemeni universities complies with the requirements detailed in IES2 (standard subjects) by 61% (see Table 5). The compliance ratios according to the three components of IES2 were as follows:

The first component (accounting, finance, and related knowledge) is covered by the accounting curriculum of Yemeni universities by 72%. The second component (organizational and business knowledge) is covered by the accounting curriculum of Yemeni universities by 46%. The third component (knowledge and competencies in IT) is covered by the accounting curriculum of Yemeni universities by 60%.

The comparison results also show that the accounting curriculum was deficient by 39% compared with standard subjects in IES2. The standard subjects that are found to be deficient in the accounting curriculum of Yemeni universities include:

- Advanced financial accounting
- International accounting standards for the preparation of financial reports
- International auditing standards
- Analysis of financial statements
- Professional values and ethics
- Corporate governance
- Business ethics
- Financial market
- Financial instruments
- Strategic management
- International business and globalization
- E-Commerce
- Excel software applications in accounting
- Computer applications in accounting

The teaching of ethics plays a strong moral fundamental role in the accountancy profession. It also achieves financial stability at the national and global levels (McNair & Milam, 1993). Thus, the absence of subjects related to professional ethics such as business ethics or professional values and ethics in the accounting curriculum of Yemeni universities is a real deficit. Absence of subjects (such as international accounting/auditing standards, analysis of financial statements, corporate governance, financial market, international business, strategic management, and advanced financial accounting) is a real weakness regarding developing the capabilities of professional accountants in the field of business advisory services. The IT subjects mentioned in the last component of IES2 are not covered by the accounting curriculum of Yemeni universities by 40%.
Table 2. Current Accounting Curriculum (Bachelor’s) in Universities of Yemen 2017–2018.

| Year       | Subjects                                | No. of hours | Practical (using computer and accounting software) | No. of lectures | Total hours per subject |
|------------|-----------------------------------------|--------------|-----------------------------------------------------|-----------------|------------------------|
|            |                                         |              |                                                     |                 |                        |
| First year | Principles of Accounting (1)            | 6            | —                                                   | 8               | 48                     |
|            | Principles of Microeconomics            | 6            | —                                                   | 8               | 48                     |
|            | Arabic Language (1)                     | 3            | —                                                   | 8               | 24                     |
|            | Principles of Pure Mathematics (1)      | 3            | —                                                   | 8               | 24                     |
|            | Principles of Business Administration   | 3            | —                                                   | 8               | 24                     |
|            | Principles of Accounting (2)            | 6            | —                                                   | 8               | 48                     |
|            | Principles of Macroeconomics            | 6            | —                                                   | 8               | 48                     |
|            | Principles of Marketing                 | 3            | —                                                   | 8               | 24                     |
|            | Organizational Behavior                 | 3            | —                                                   | 8               | 24                     |
|            | Arabic Language (2)                     | 3            | —                                                   | 8               | 24                     |
|            | Principles of Statistics                | 3            | —                                                   | 8               | 24                     |
|            | Yemen Government System                 | 3            | —                                                   | 8               | 24                     |
|            | Principles of Computer Science (1)      | 3            | —                                                   | 8               | 24                     |
| Second year| Accounting for Partnership              | 6            | —                                                   | 8               | 48                     |
|            | Production Management & Operations      | 6            | —                                                   | 8               | 48                     |
|            | Financial Mathematics                   | 6            | —                                                   | 8               | 48                     |
|            | Principles of Pure Mathematics (2)      | 6            | —                                                   | 8               | 48                     |
|            | Principles of Computer Science (2)      | 3            | —                                                   | 8               | 24                     |
|            | Research Methodology                    | 3            | —                                                   | 8               | 24                     |
|            | English Language (1)                    | 3            | —                                                   | 8               | 24                     |
|            | Accounting for Corporations             | 6            | —                                                   | 8               | 48                     |
|            | Principles of Insurance                 | 3            | —                                                   | 8               | 24                     |
|            | Money and Banks                         | 3            | —                                                   | 8               | 24                     |
|            | Islamic Culture                         | 3            | —                                                   | 8               | 24                     |
|            | Principles of Law                       | 3            | —                                                   | 8               | 24                     |
|            | English Language (2)                    | 3            | —                                                   | 8               | 24                     |
| Third year | Cost Accounting (1)                     | 6            | —                                                   | 8               | 48                     |
|            | Tax Accounting (1)                      | 6            | —                                                   | 8               | 48                     |
|            | Auditing (1)                            | 3            | —                                                   | 8               | 24                     |
|            | Financial Management                    | 6            | —                                                   | 8               | 48                     |
|            | Governmental & National Accounting      | 6            | —                                                   | 8               | 48                     |
|            | Unified Accounting System               | 6            | —                                                   | 8               | 48                     |
|            | Cost Accounting (2)                     | 6            | —                                                   | 8               | 48                     |
|            | Tax Accounting (2)                      | 6            | —                                                   | 8               | 48                     |
|            | Public Finance                          | 3            | —                                                   | 8               | 24                     |
|            | Commercial Law                          | 3            | —                                                   | 8               | 24                     |
|            | Purchases & Storage Management          | 6            | —                                                   | 8               | 48                     |
|            | Operations Research                     | 6            | —                                                   | 8               | 48                     |
| Fourth year| Special Accounting Studies              | 6            | —                                                   | 8               | 48                     |
|            | Auditing (2)                            | 3            | —                                                   | 8               | 24                     |
|            | Accounting for Financial Institutions   | 6            | —                                                   | 8               | 48                     |
|            | Managerial Accounting (1)               | 6            | —                                                   | 8               | 48                     |
|            | International Accounting                | 6            | —                                                   | 8               | 48                     |
|            | Accounting Theory                       | 3            | —                                                   | 8               | 48                     |
|            | Cost Accounting (3)                     | 6            | —                                                   | 8               | 48                     |
|            | Oil and Agriculture Accounting          | 6            | —                                                   | 8               | 48                     |
|            | Managerial Accounting (2)               | 6            | —                                                   | 8               | 48                     |
|            | Accounting Information Systems (AIS)     | 3            | —                                                   | 8               | 48                     |
|            | Principles of Accounting in English      | 3            | —                                                   | 8               | 48                     |
|            | Research Project                        | 3            | —                                                   | 8               | 24                     |
**Table 3.** International Education Standards (IES).

| Title                                                                 | Effective date         |
|---------------------------------------------------------------------|------------------------|
| IES1 Entry Requirements to a Program of Professional Accounting Education | January 1, 2005       |
| IES2 Content of Professional Accounting Education Programs           | January 1, 2005       |
| IES3 Professional Skills                                            | January 1, 2005       |
| IES4 Professional Values, Ethics, and Attitudes                      | January 1, 2005       |
| IES5 Practical Experience Requirements                              | January 1, 2005       |
| IES6 Assessment of Professional Capabilities and Competence         | January 1, 2005       |
| IES7 Continuing Professional Development: A Program of Lifelong Learning and Continuing Development of Professional Competence | January 1, 2006       |
| IES8 Competence Requirements for Audit Professionals                 | July 1, 2008          |

Source. Adapted from Saville (2007).

**Table 4.** Comparison of the Subject Areas of IES2 With the Accounting Curriculum in Yemeni Universities.

| Detailed subject areas in IES2 | Standard subjects | The extent to which these subjects exist in the accounting curriculum of Yemeni universities |
|---------------------------------|-------------------|------------------------------------------------------------------------------------------|
| 1. Component of accounting, finance, and related knowledge                |                   |                                                                                         |
| Financial accounting and reporting                                      | Principles of Accounting | Yes                                                                                     |
|                                                                              | Corporate Accounting | Yes                                                                                     |
|                                                                              | International accounting | Yes                                                                                   |
|                                                                              | Advanced financial accounting | No                                                                                     |
| Management accounting and control                                        | Managerial accounting | Yes                                                                                     |
|                                                                              | Cost accounting       | Yes                                                                                     |
|                                                                              | Governmental accounting | Yes                                                                                     |
| National and international accounting and auditing standards              | International accounting standards for the preparation of financial reports | No                                                                                     |
|                                                                              | International auditing standards | Yes                                                                                   |
|                                                                              | Accounting theory     |                                                                                         |
| Business and commercial law                                              | Commercial law       | Yes                                                                                     |
| Taxation                                                                    | Tax accounting       | Yes                                                                                     |
| Audit and insurance                                                        | Auditing             | Yes                                                                                     |
|                                                                              | Insurance             | Yes                                                                                     |
| Finance and financial management                                         | Financial management | Yes                                                                                     |
|                                                                              | Public Finance        | Yes                                                                                     |
|                                                                              | Analysis of financial statements | No                                                                                     |
| Professional values and ethics                                            | Professional values and ethics | No                                                                                     |
| 2. Component of organizational and business knowledge                     |                   |                                                                                         |
| Economics                                                                  | Principles of microeconomics | Yes                                                                                   |
|                                                                              | Principles of macroeconomics | Yes                                                                                   |
| Work environment and statistics                                           | Principles of management | Yes                                                                                   |
|                                                                              | Statistics            | Yes                                                                                     |
| Corporate governance                                                      | Corporate governance | No                                                                                     |
| Business Ethics                                                           | Business ethics       | No                                                                                     |
| Financial market/Financial Instruments                                   | Financial market      | No                                                                                     |
|                                                                              | Financial instruments | No                                                                                     |
| Organizational behavior                                                   | Organizational behavior | Yes                                                                                   |
| Strategic management                                                      | Strategic management | No                                                                                     |
| Marketing                                                                  | Principles of marketing | Yes                                                                                   |
| International business                                                    | International business and globalization | No                                                                                     |
| E-Commerce                                                                 | E-Commerce            | No                                                                                     |
| 3. Component of knowledge and competencies in IT                          |                   |                                                                                         |
| General knowledge of IT                                                   | Principles of Computer Science | Yes (theory)                                                                            |
| Knowledge of IT control                                                   | Excel software applications in accounting | No                                                                                     |
| Competencies of IT control                                                | Computer applications in accounting | No                                                                                     |
| IT user competences                                                       | Accounting Information System (AIS) | Yes (theory)                                                                             |
| The roles of manager, evaluator, or designer of information systems.      | Principles of Management Information System (MIS) | Yes (theory)                                                                            |

Note. IES = International Education Standard.
Analysis of the Questionnaire Results

This section aims to confirm the results obtained from the review and analysis of the accounting curriculum currently taught in the Yemeni universities (see section “General Analysis of the Accounting Education Curriculum in Yemeni Universities”). It analyzes the results of the questionnaire prepared for this purpose. The questionnaire contained two parts: The first part is about the demographic characteristics of the respondents (Table 6), and the second part presents the items related to the study (Tables 7 and 8). Table 6 shows that most of the sample members are newly graduated students (62.3%). Other demographic characteristics are summarized as follows:

- The majority of sample members are males (87.8%).
- The majority of them are aged less than 30 (49.1%).
- The majority are specialized in accounting (78.2%).
- The majority (more than 56%) are graduated in 2016–2018.

Table 5. Result of Compliance With IES2.

| Components of IES2 | n of standard subjects in IES2 | Yes | No |
|--------------------|---------------------------------|-----|----|
| First component    | 18                              | 13  | 5  |
| Second component   | 13                              | 6   | 7  |
| Third component    | 5                               | 3   | 2  |
| Total              | 36                              | 22  | 14 |

Note. IES = International Education Standard.
Source. Table 4.

Table 6. Demographic Characteristics of the Respondents.

| Total (N = 499) | Frequency (%) |
|-----------------|---------------|
| Target sample   |               |
| Newly graduated students | 311 (62.3) |
| Practitioners   | 188 (37.7)   |
| Gender          |               |
| Male            | 438 (87.8)   |
| Female          | 61 (12.2)    |
| Age             |               |
| <30             | 245 (49.1)   |
| 30–50           | 176 (35.3)   |
| >50             | 78 (15.6)    |
| Specialization  |               |
| Accounting      | 390 (78.2)   |
| Business Admin. | 109 (21.8)   |
| Year of graduation |            |
| Between 2010 and 2014 | 87 (17.4) |
| 2014–2015       | 51 (10.2)    |
| 2015–2016       | 79 (15.8)    |
| 2016–2017       | 111 (22.2)   |
| 2017–2018       | 171 (34.3)   |

Tables 7 and 8 clarify the second part of the questionnaire (items and replies). The replies, mean, and standard deviation for each item are shown in these tables. Cronbach’s alpha value of all questionnaire items is above .70, which demonstrates a good level of reliability (Hair et al., 2016). Table 7 presents “Perceptions of practitioners and newly graduated students for knowledge and skills acquired during their bachelor period.” The results indicate that perceptions of respondents toward “Key accounting skills,” “Knowledge of key accounting branches,” and “Accounting problem analysis and solving” were positive (M = 4.05, 3.95, 3.92; p < .001; R = high). The same thing regarding “Principles of management and marketing” and “Oral and written communication skills” (M = 3.69, 3.67; p < .001; R = high).

Although the values and ethics item is not included in the accounting curriculum of Yemeni universities, the respondents’ perceptions were high toward the acquisition of this item during the bachelor’s period (M = 3.58; p < .001; R = high). This may be due to religious belief and values of the Yemeni society, which urge the application of values and ethics in all works. However, this should not prevent the necessity of including the values and ethics item as a basic subject within the accounting curriculum, especially in the current era. Regarding International Financial Reporting Standards (IFRS) skills item, the respondents’ perceptions were close to neutral (i.e., M = 2.99; p > .05; R = moderate). This is logical in light of the absence of such an item (as a basic subject) within the accounting curriculum of Yemeni universities. The same thing for “General computer skills” (M = 3.14; p < .05; R = moderate), as such subjects are available within the curriculum but are wholly taught in theory. For the last item “IT skills in accounting,” the perceptions of respondents was low (M = 2.29; p < .001; R = low). This is logical and realistic in light of the absence use of IT and related subjects in accounting education at Yemeni universities.

In Table 8, most respondents (91.8%) approve that the accounting curriculum of Yemeni universities does not meet the job market demands regarding IT in accounting. They also agree that the inclusion of IT-related subjects in the accounting curriculum of Yemeni universities could meet the job market demands regarding IT. Their perceptions...
The IT Skills are shown in Figure 1, with a mean score of 3.41. All of the IT skills are ranked of above-average importance which strongly supports previous research that indicates practitioners and graduates value general

Table 7. Descriptive Statistics of Respondents' Replies (1).

| No. | Items                                                   | Replies (N = 499) |                        |                        |                        |                        |                        |                        |                        |                        |                        |                        |                        |                        |                        |                        |
|-----|---------------------------------------------------------|-------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
|     |                                                         | SD (%)            | D (%)                  | N (%)                  | A (%)                  | SA (%)                 | M                      | SD                     | R                      | α                      |
| 1   | Key accounting skills                                   | 0.2               | 5.2                    | 13.8                   | 50.7                   | 30.1                   | 4.05***                | 0.815                   | High                   | .724                   |
| 2   | Knowledge of key accounting branches                    | 1.4               | 7.6                    | 16.8                   | 43.3                   | 30.9                   | 3.95***                | 0.952                   | High                   |                        |
| 3   | Accounting problem analysis and solving                 | 0.4               | 10.2                   | 13.2                   | 49.3                   | 26.9                   | 3.92***                | 0.917                   | High                   |                        |
| 4   | Professional values and ethics in business              | 2.6               | 22.0                   | 10.8                   | 43.9                   | 20.6                   | 3.58***                | 1.121                   | High                   |                        |
| 5   | Principles of management and marketing                  | 4.6               | 12.2                   | 13.8                   | 48.7                   | 20.6                   | 3.69***                | 1.073                   | High                   |                        |
| 6   | Oral and written communication skills                   | 3.8               | 15.0                   | 14.4                   | 43.7                   | 23.0                   | 3.67***                | 1.101                   | High                   |                        |
| 7   | IFRS skills                                            | 5.2               | 36.5                   | 24.0                   | 22.8                   | 11.4                   | 2.99                   | 1.123                   | Moderate                |                        |
| 8   | General computer skills                                 | 7.4               | 28.9                   | 16.6                   | 36.5                   | 10.6                   | 3.14**                 | 1.165                   | Moderate                |                        |
| 9   | IT skills in accounting                                 | 11.6              | 58.9                   | 18.0                   | 11.4                   | Nil                    | 2.29***                | 0.818                   | Low                    |                        |

Note. All values of the mean are measured based on a 5-point scale of Likert-type, anchored on 1 (SD = strongly disagree); 2 (D = disagree); 3 (N = neutral); 4 (A = agree); 5 (SA = strongly agree); M = mean; SD = standard deviation; α = Cronbach’s alpha; R = rank; IFRS = International Financial Reporting Standards.

*aR = high.

*p < .05. **p < .01. ***p < .001; not significant (ns) at p ≥ .05.

Table 8. Descriptive Statistics of Respondents' Replies (2).

| No. | Items                                                   | Replies (N = 499) |                        |                        |                        |                        |                        |                        |                        |                        |                        |                        |                        |                        |                        |                        |
|-----|---------------------------------------------------------|-------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
|     |                                                         | Yes (%)           | No (%)                 | SD (%)                 | D (%)                  | N (%)                  | A (%)                  | SA (%)                 | M                      | SD                     | R                      | α                      |
| a   | Generally, does the current accounting curriculum of Yemeni universities meet the job market demands regarding IT in accounting? | 41 (8.2)          | 458 (91.8)            | —                      | —                     | —                      | —                      | —                      | —                      | —                      | .779                   |
| b   | If no, does the inclusion of IT-related subjects in the accounting curriculum of Yemeni universities meet the job market demands? | 458 (100)         | Nil                    | —                      | —                     | —                      | —                      | —                      | —                      | —                      |                        |
| c   | If yes, which of the following IT-related subjects should be included in the accounting curriculum of Yemeni universities: | —                  | —                      | 5.0                    | 17.2                   | 18.2                   | 39.7                   | 19.8                   | 3.52***                | 1.138                  | 3                      |
| 1   | Excel software applications in accounting               | —                  | —                      | 4.6                    | 25.3                   | 10.0                   | 40.7                   | 19.4                   | 3.45***                | 1.192                  | 5                      |
| 2   | Communications software (e.g., Outlook)                | —                  | —                      | Nil                    | 5.6                    | 8.0                    | 66.1                   | 20.2                   | 4.01***                | 0.713                  | 2                      |
| 3   | Accounting software (e.g., SAP, Motakamel, Onyx)       | —                  | —                      | Nil                    | 6.0                    | 7.0                    | 64.9                   | 22.0                   | 4.03***                | 0.729                  | 1                      |
| 4   | General computer skills (e.g., Windows, internet, word processing, spreadsheets) | —                  | —                      | Nil                    | 29.3                   | 12.4                   | 36.1                   | 22.2                   | 3.51***                | 1.132                  | 4                      |
| 5   | E-commerce                                             | —                  | —                      | 1.6                    | 29.3                   | 15.0                   | 34.1                   | 20.0                   | 3.42***                | 1.152                  | 6                      |

Note. All values of the mean are measured based on a 5-point scale of Likert-type, anchored on 1 (SD = strongly disagree); 2 (D = disagree); 3 (N = neutral); 4 (A = agree); 5 (SA = strongly agree); M = mean; SD = standard deviation; α = Cronbach’s alpha; R = rank.

*aR = high.

*p < .05. **p < .01. ***p < .001; not significant (ns) at p ≥ .05.
computer skills, accounting software, Excel software, E-commerce, and communications software, among others. This set differs in that each of the functional skill sets (e.g., general computer skills and accounting software) represents a group of related competencies.

Limitations and Further Research

One main limitation of this study is that it relied solely on Yemeni practitioners and newly graduated students to verify the study questions. Hence, it is better for future research to be directed toward academics and employers. Second, the number of females who participated in this study was few (12.2%) compared with males (87.8%). This is because of some difficulties and obstacles in reaching the women communities due to the nature of the culture and the construction of society in Yemen. Finally, further research should be conducted to evaluate accounting education in Yemen and other countries; they should focus on the relationship between costs and benefits of successful accounting education in the job market.

Conclusion

This study mainly aims to examine (a) whether the current accounting curriculum of Yemeni universities meets the job market demands regarding IT and (b) whether the inclusion of relevant IT in the accounting curriculum meets the job market demands regarding IT. To achieve this, the article relied on a general analysis of the accounting curriculum for Yemeni universities as well as the use of the questionnaire. The study revealed that despite repeated recommendations by researchers (in different environments and countries) that accounting curriculum should be restructured in line with market demands, accounting education at Yemeni universities is still traditional as the traditional method of teaching accounting is still common. Key accounting subjects such as accounting, auditing, taxation, costing, and so on are taught without any reference to the effect of IT. In addition, there is a complete absence of practical application using the computer, where even topics such as computer basics and AIS are only taught in theory. The traditional method used at Yemeni universities does not grant the student the required skills to practice the accounting profession efficiently.

With regard to the results of the questionnaire in this study, most respondents approve that the current accounting curriculum of Yemeni universities meets the job market demands theoretically (see Table 7). Although the focus on the theoretical aspects is important, this is not enough to prepare students to enter the job market. In addition, the absence of subjects such as professional values and ethics and IFRS is a real problem that needs to be addressed. The respondents also approve that the current accounting curriculum of Yemeni universities does not meet the job market demands regarding IT. They confirmed that the inclusion of
IT-related subjects and automated accounting systems in the teaching of accounting curriculum meet the job market demands regarding IT. The statistical analysis results showed that respondents considered that all of the IT-related subjects mentioned in the questionnaire (Table 8) are important in the accounting education and ranked them on the basis of their level of importance as follows (starting from the most important):

1. General computer skills (e.g., Windows, internet, word processing, spreadsheets)
2. Accounting software (e.g., SAP, Motakamal, Onyx)
3. Excel software applications in accounting
4. E-commerce
5. Communications software (e.g., Outlook)
6. Other

From the results obtained, the study offers a number of implications. For example, it may encourage universities and colleges to reconsider and redesign existing accounting curricula to accommodate the developments in IT. It may also draw the attention of Yemeni professional accounting bodies to the necessity of integrating the IT skills that the market expects into the process of designing accreditation guidelines for universities. Moreover, university students may take advantage of this study as market demand is a good indicator for them to improve their knowledge base and technology skills during the university period. Suggestions include (a) the need to include the subjects specified in IES2 (see Table 4) and not included in the current accounting curriculum, particularly on professional values and ethics, business ethics, and IFRS; (b) the implementation of joint programs between universities and economic units in the job market that contribute to the development of the accounting curriculum; (c) focusing on preparing students properly with regard to using the computer in accounting; and (d) the focus should be on using IT in accounting (i.e., application) rather than on theoretical general computer science.

Appendix

Table A1. Questionnaire Related Items.

| No. | Item/question                                      | Source                                                                 |
|-----|---------------------------------------------------|------------------------------------------------------------------------|
| 1   | Key accounting skills                             | Awayiga et al. (2010), Kavanagh & Drennan (2008), and Jackling & De Lange (2009) |
| 2   | Knowledge of key accounting branches              | Awayiga et al. (2010)                                                  |
| 3   | Accounting problem analysis and solving           | Stoner (2009), Wessels (2005), Kavanagh & Drennan (2008), Jackling & De Lange (2009), and Sithole (2015) |
| 4   | Professional values and ethics                    | Bain et al. (2002), Wessels (2005), Kavanagh & Drennan (2008), Zureigat (2015), Jackling & De Lange (2009), and Sithole (2015) |
| 5   | Principles of management and marketing            | Awayiga et al. (2010) and Nicolescu & Pacarhonjun (2009) |
| 6   | Oral and written communication skills             | Wessels (2005), Awayiga et al. (2010), Kavanagh & Drennan (2008), Zureigat (2015), Jackling & De Lange (2009), and Sithole (2015) |
| 7   | IFRS skills                                       | Glover & Werner (2015)                                                  |
| 8   | General computer skills                           | Stoner (2009), Wessels (2005), Awayiga et al. (2010), Greenstein & McKee (2004), Burnett (2003), Zureigat (2015), and Jackling & De Lange (2009) |
| 9   | IT skills in accounting                           | Awayiga et al. (2010)                                                  |
| 10  | Accounting software                               | Wessels (2005) and Kavanagh & Drennan (2008)                           |
| 11  | Excel software applications in accounting         | Ramachandran Rackliffe & Ragland (2016), Lee et al. (2018, 2019)       |
| 12  | E-commerce                                        | Bain et al. (2002), Wessels (2005), Awayiga et al. (2010), and Burnett (2003) |
| 13  | Communications software                           | Bain et al. (2002), Wessels (2005), Awayiga et al. (2010), and Burnett (2003) |

Note. IFRS = International Financial Reporting Standards; IT = information technology.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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