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Knowledge and Skills Required in Accounting Education: A Comparative Study

Rim Khemiri

Abstract

Accounting education should continually evolve in order to better prepare future professionals for the ever-changing needs. This study aims to ascertain the knowledge, skills and teaching methods considered to be the most important for the successful practice of Certified Public Accountants (CPA). For this purpose, we conducted a survey of 306 CPA and CPA trainees in Tunisia, focuses on four dimensions: knowledge (19 items), professional skills (22 items), technological skills (18 items), and teaching methods (12 items). Results indicated that there are significant differences among the tow subgroups responses regarding the perceived importance of such knowledge and skills. This research presents what the respondents agreed upon as being the most important in terms of knowledge, skills, and teaching methods for the accounting profession. The findings also revealed that there are a similarities and differences between the perceptions of Tunisian professionals and those of Americans and Chinese professionals.

Keywords: Perceptions, Accounting profession, Accounting education, Knowledge, Skills, Teaching methods

1. Introduction

We are witnessing an unprecedented acceleration of the evolution of the business environment, particularly in terms of globalization, market liberalization and the diffusion of new technologies [1]. This results in a constant pressure on higher education institutions, so that they take into account these new constraints and adapt constantly. Accounting education is no exception to the rule, and it has now become necessary to make it evolve by introducing new goals, new tools and new courses.

This development is all the more urgent since some researchers [2–4] have highlighted two disturbing phenomena in the United States: increasingly fewer students opt for educations in accounting, and it is the least brilliant of them who are now choosing this discipline. We can question the extrapolation of these trends in our case, Tunisia. Developments related to globalization, liberalization of markets and the diffusion of new technologies require expanding both the knowledge and the skills from professional accountants in order to meet the needs of the profession in a changing environment. Several previous studies have examined the question of what should be the knowledge and skills components in accounting education programs [5–7].

This research fits into this context. Through a questionnaire-based survey administered to Tunisian professional accountants, we will seek, first, to highlight the knowledge, skills, and teaching methods seen as important for professional accountants and, secondly, we will conduct a comparative study regarding the knowledge and skills perceived as necessary by professional accountants practicing in the United States, China, and Tunisia. Thus, to adapt to the environmental changes mentioned above, accounting education must evolve in order to prepare future professionals for these new requirements. Hence the interest of our research questions: What kind of knowledge, skills and teaching methods are seen as important for professional accountants? And secondly, do the needs of Tunisian accountants professionals match to those of Americans and Chinese's professionals?

The remainder of the paper is organized as follows. The Section 2 presents the study background and reviews the relevant literature. The third section describes the research methodology. Perceptions of the Tunisian professional accountants are described and discussed in Section 4. Finally, we conclude in Section 5 with implications for further research and practice.

2. Study background and literature review

In recent decades, considerable changes have occurred in the business environment, as well as in the nature and the role of the accounting profession. These changes have led accounting education to fundamentally call itself into question [1, 2, 8–11]. Indeed, in western countries, several academic studies and professional reports have identified issues related to the accounting curriculum [5–7]. These latter are considered traditional because they are focused on the training of students to prepare for professional qualifying exams, to the detriment of teaching a broader base of knowledge and professional skills [12–17]. These significant criticisms from the accounting profession, as well as the rapid evolution of technologies [1], economic globalization, and increasing competition in the business world have led teachers in the accounting field to undertake a reform of accounting education, both in the United States and in other countries [18–22]. Thus, in the American context, since 1986 and in order to cope with these changes, the major accounting firms (the “Big Four”) created a dedicated commission to study the correlation between accounting education programs and the requirements of the accounting profession resulting from new economic conditions. Due to perceived deficiencies in accounting education, a great number of studies have been conducted, seeking to improve it. Several studies were conducted in the United States, including the report prepared by the Bedford Committee [12] promoting the reform of accounting education in the United States. Later, one report focused on the prospects of international accounting firms and education [23] and, in 1990, the Accounting Education Change Commission (AECC) published a report entitled: *Objectives of Education for Accountants*, stating that the main objective of accounting education is to prepare students to become professional accountants, instead of being professional accountants when they enter the profession [24]. In 1992 the AECC finally recognized the existence of a mismatch between the desired profile of the professional accountant and the qualities offered by accounting education programs. Furthermore, in its report on the future of the profession, the American Institute of Certified Public Accountants (AICPA) called for a change in the accounting curriculum in order to meet the requirements of the accounting profession [25]. For example, these different studies have demonstrated the need to extend the accounting curriculum towards a general accounting education, rather than focusing on traditional training that is overly focused on preparing students for

professional qualification exams [9, 13]. Indeed, in higher education institutions in many countries, most accounting programs have been built too narrowly, with limited knowledge and a lack of skills needed to perform the accounting profession [2, 12, 24, 26, 27].

In their report entitled *Accounting Education: Charting the Course through a Perilous Future*, the same view is shared by Albrecht and Sack [2]. These authors have reached the conclusion that accounting education should change if it is to be relevant and add value to the students and the community. Some educators have heard these warnings and have made significant changes to their programs and curricula. However, in general, the changes undertaken in accounting education have not been expansive enough or were too superficial. A change is all the more urgent since Albrecht and Sack [2] found a decrease in the number of students enrolled in accounting. They also noted that both accounting practitioners and teachers have made alarming statements about students enrolled in accounting, saying that students completing their studies in accounting would not be real specialists in accounting. These are serious problems and we believe that the criticisms are well-founded. Not to mention the threats resulting from market changes and the fact that some factors are not controlled. In addition, Albrecht and Sack argue that the current accounting education should focus on teaching professional skills and greatly expanding the knowledge base. In their report, Albrecht and Sack list a set of knowledge, professional skills, technological skills, and teaching methods, and study the perceived importance of American practitioners and teachers regarding the components of this list. They found that there is a gap in the perception of the importance as well as at the level of the ranking of the knowledge, skills and methods. Teachers are following in the path of the practitioners in recognizing the importance of teaching a number of skills and extra-accounting knowledge [2]. The authors essentially recommend reconsidering the content of programs, focusing on the development of skills at the expense of the excessive accumulation of knowledge, and changing the pedagogy.

Later, in 2002, Francisco and Kelly proposed a continuation of Albrecht and Sack's work, particularly in the area of skills development. To do this, students were asked to assess different professional skills in order to identify those that were the most important for their future career. They identified differences in the perceived importance of these skills between students enrolled in accounting education and those registered in other disciplines. Although there are some variations in the perceptions of students with practitioners and teachers, all stakeholders nevertheless agreed on the need for an immediate and thorough reform in accounting education [2, 28, 29]. Since the report by Albrecht and Sack [2], concerns about the curriculum, seemingly unchanged in the post-Enron era, have been renewed. Attempts to fill in the gaps have not achieved a significant change, and accounting education continues to be "limited, focusing strictly on technical accounting" [30]. Several authors have criticized the limited reaction of academics following the accounting scandals, and advocated broadening the base of accounting education by addressing the economic, social, cultural, and political roles of accounting [31–35]. More specifically, Ravenscroft and Williams [31] argue that "there are currently serious omissions in the accounting curriculum which must be rectified, and that accounting students are poorly trained in some critical areas. Almost, a decade later, the Pathways Commission [5] identified a need for a new model of education that is better aligned with the contemporary environment and evolving demands on accounting professionals. It is the integrated competency-based framework developed as part of a research project of Lawson *et al.*, [6], the first report of the Task Force established in 2010 by the Institute of Management accountants (IMA) and the Management Accounting Section (MAS) of the American Accounting Association,

to address certain issues of accounting education and make curriculum recommendations for all accounting majors.

Although resistance to changes in accounting education seems to be considerable [2, 17, 36], the above studies and reports produced a positive impact on the development of the accounting education in the Chinese context. Indeed, several studies have focused on the context of an emerging country as China [37–39]. In recent years, due to the rapid evolution of economic reforms and the internationalization of Chinese accounting, accounting education underwent considerable changes to adopt western systems [40–42]. However, after more than two decades of reforms, the Chinese system of accounting education is now quite similar to the U.S. model, deemed traditional [43]. It is in this context that Lin *et al.*, [37] estimate that the Chinese accounting profession should now expect a higher level from the students enrolled in accounting who will be the future professionals. For this, the authors have sought the views of students, teachers and accounting practitioners about their perception of the importance of the required knowledge, skills, and pedagogy, and their assessment of whether or not the specified knowledge and skills component have effectively been delivered by the existing accounting curriculum and pedagogy in China. Although there is some variance in the survey responses, they generally agreed on a set of knowledge and skills and methods deemed important for the training of students. The results also reveal a gap between the most important knowledge and skills for the profession and those taught. Thus, it appears that the reform of accounting education in China is not only necessary, but indispensable.

At the international level, the problem of professional accounting education has become increasingly important, which led the International Federation of accountants (IFAC) to conclude that it is imperative to develop a general framework and standards governing accounting education. To do this, the IFAC Education Committee, International Accounting Education Standards Board (IAESB) has developed International Education Standard (IES) aimed at professional accountants. In addition, the International Educational Guideline (IEG) No. 9 of IFAC asserts that “the objective of theoretical education in accounting is to prepare future competent professional accountants (...) it is necessary to offer an education that provides them with knowledge, skills and rules that allow them to continue to enrich their background and adapt to change throughout their active life” [44]. The IAESB sets standards to increase the “competence of the global accountancy profession and contribute to strengthened public interest” [45]. Indeed, the IAESB declares that adopting IES practice will enhance education in the public interest by “contributing to the ability of the accountancy profession to meet the needs of decision makers” [46]. However, the challenge to the IAESB to motivate education practice in its organizational field goes beyond influencing professional bodies and international regulators with an interest in globalized accounting practice. Audiences involved in professional accountancy education also include, for example professional bodies operating in countries at different stages of development, national governments, private training providers, universities, and employers [47].

In conclusion, the experience of the reforms in accounting education in the United States, in China, as well as in other countries is a relevant reference from which we can draw the inspiration to change the accounting education in other contexts. Given the rapid integration of the Tunisian economy in the global markets through its production of high technology products and the globalization of its trade activities, accounting education in Tunisia is similar to that of the western world. It is, as such, also confronted with this new requirement which has the objective of training students in order to meet the challenges arising from the changing business environment. It seems to us that it is time to suggest changes in the accounting

education in order both to broaden the base of knowledge and to develop skills, and change teaching methods. The timing is particularly appropriate since the Tunisian government, after implementing LMD reform (License-Master-Doctorate) [48], is currently putting implementing a new reform of higher education [49].

3. Methodological approach

In light of our research questions and our purposes, we conducted a survey using a questionnaire prepared based on the literature focused on the theme of the accounting profession needs and accounting education, on the IES and, lastly, on the various existing questionnaires on this theme. The first draft was submitted to three phases of pre-testing. Once finalized, the questionnaire was administered to the 615¹ Certified Public Accountants (CPA) enrolled in the Association of CPA of Tunisia, as well as to the 444² Certified Public Accountant trainees (CPAt) who passed the national CPA examination and were, at the time, doing their internship.³

The survey instrument includes a list of knowledge (19 items), professional, and technological skills (respectively, 22 items and 18 items), as well as teaching methods (12 items). We asked respondents to express their views about their perception of the importance of the required knowledge, skills, and pedagogy on a scale of 1–4 (1 represents not at all important; 4 is very important).

CPA education seems appropriate to our object of research for three reasons. Firstly, in the Tunisian context, CPA education is training that deals with a very broad program, encompassing different subject matter already studied in the master of accounting (level: high school diploma +4 years). Secondly, the Tunisian CPA education leads to a prestigious national examination. Thirdly, success in this exam allows students to become a CPA after the completion of three years of internship.

An initial release of our survey instrument was conducted by e-mail in September 2010. We then presented the questionnaire by hand to the 350 CPA and CPAt who had not yet responded to our email. After four reminders, we received 131 questionnaires from the CPA and 175 questionnaires from the CPAt. Altogether, 306 usable questionnaires were collected and were entered into SPSS. The overall response rate was 37%, including 26% for the CPA and 48% for the CPAt. Statistical tests carried out in this study are descriptive statistics and comparison of means tests.

4. Professional accountants' perceptions

In this part of the study we will present the perceptions of professional accountants. First, we will put forward the differences in perception between the Tunisian CPA and CPAt about the importance of the needs (4.1.). These needs are seen in terms of knowledge, professional and technological skills, and finally, in terms of teaching methods. Then, we will propose a comparison of perceptions in terms of

¹ The names of Certified Public Accountants as well as their e-mail address were obtained from the membership directory, available on the website of the Association of Certified Public Accountants of Tunisia-OECT (www.oect.org.tn).

² The names of Certified Public Accountants trainees and their email address were obtained from a list that we were provided by the Association of CPA of Tunisia.

³ Having passed the national examination of Certified Public Accountants in the four public institutions that offer this training and are on period of practical experience that should be a minimum of three years.

needs from professional accountants who are in developed, emerging, or developing countries. These countries are the United States, China and Tunisia (4.2.).

4.1 Perceptions about the needs

Tables 1-4 present the descriptive statistics of our survey results. Mean scores and standard deviations for each item of the knowledge, skills and teaching methods are listed in Panel 1, 2, 3, and 4 respectively. The ranking order of the perceived importance of those items (based on their mean scores) is indicated as well. A significance test of means was also carried out based on the one-way ANOVA. This test allowed us to determine if the status of respondents (CPA or CPAt) is statistically significant in the evaluation of each item.

4.1.1 Empirical results

From the first column in **Table 1**, we can notice that, at the aggregate level, the respondents identified tax, auditing/assurance services, business law, financial accounting, managerial accounting, information systems, finance, technology topics, business strategy and electronic commerce as the ten most important knowledge subjects. Analytical/critical thinking, oral communication, foreign language, written communication, professional demeanor, measurement, risk analysis, teamwork, continuous learning and computing technology were identified as the ten most important professional skills (**Table 2**). According to **Table 3**, spreadsheet software, word processing software, world-wide web searching, systems analysis, windows, presentation software, database software, file & directory management, project management and communication software are, in turn, considered by respondents as the ten most important technological skills. Finally, assignments with real companies, team teaching, case analysis, team (group) work and role playing were identified as the five most effective methods for training accounting students in the current business environment in Tunisia (**Table 4**).

In addition, **Table 1** presents the means and the standard deviations for the CPA and CPA trainees. For the knowledge components, it is important to note that both CPAs and CPA trainees recognized tax as the most important knowledge. However, some variations exist in the scores of perceived importance and the ranking among the two groups of respondents. Regarding the top five most important knowledge items, CPA have ranked auditing/assurance services as the second most important knowledge item, although auditing was ranked as the third most important knowledge item by the CPA trainees. Financial accounting is recognized by CPA as the fourth most important knowledge item, but it was ranked the second most important knowledge item by the CPA trainees. In addition, CPA ranked Ethics and social responsibility as the twelfth most important knowledge, but ethics was seen as only the sixteenth most important knowledge item by the CPA trainees. We also note rather significant differences in ranking regarding several knowledge items, such as, for example, Information systems, Finance and Electronic commerce. Mean scores of the two groups of respondents concerning the less important knowledge items varied considerably. However, retail and sales were ranked last in accordance with perceptions of the two groups.

With regard to the three most requested professional skills, CPA and CPA trainees are consistent in the identification of the third most important skill, namely a foreign language. While analytical/critical thinking was ranked by the CPA trainees as being the most important professional skill, it was ranked the fifth professional skill by the CPA. Regarding oral communication, although it is considered to be the most important professional skill by CPA, it is only recognized by

Panel 1: Knowledge	Total population N = 306			Certified Public Accountants N = 131			Certified Public Accountants trainees N = 175			F (P)
	Mean	Standard deviation	Rank	Mean	Standard deviation	Rank	Mean	Standard deviation	Rank	
Taxes	3.777	.508	1	3.748	.501	1	3.800	.514	1	.780(.378)
Auditing/Assurance services	3.620	.616	2	3.717	.468	2	3.548	.700	3	5.711(.017)*
Financial accounting	3.604	.558	3	3.580	.540	4	3.622	.572	2	.437(.509)
Business law	3.588	.617	4	3.679	.530	3	3.520	.668	4	5.066(.025)*
Managerial accounting	3.477	.633	5	3.549	.584	5	3.422	.663	6	3.021(.083)
Information systems	3.447	.732	6	3.542	.623	6	3.377	.799	8	3.829(.051)
Finance	3.402	.604	7	3.343	.565	8	3.445	.630	5	2.148(.144)
Technology topics	3.385	.880	8	3.351	.822	7	3.411	.923	7	.350(.554)
Business strategy	3.153	.741	9	3.274	.784	9	3.062	.696	9	6.223(.013)*
Electronic commerce	3.009	.932	10	3.190	.912	10	2.874	.926	12	8.864(.003)**
Statistics/Quantitative methods	2.990	.986	11	3.076	.873	13	2.925	1.061	10	1.750(.187)
Organizational behavior/ Human resource management	2.928	.948	12	3.152	.808	11	2.760	1.011	13	13.359(.000)**
Accounting research methods	2.892	.848	13	2.877	.784	14	2.902	.894	11	.065(.799)
Ethics and social responsibility	2.849	.990	14	3.099	.918	12	2.662	1.003	16	15.227(.000)**
Operations/Supply-chain management	2.771	.968	15	2.824	.854	15	2.731	1.046	14	.690(.407)
Global/International business	2.722	.907	16	2.793	.865	16	2.668	.937	15	1.430(.233)
Economics	2.408	.856	17	2.740	.837	17	2.160	.786	18	38.620(.000)**
Marketing	2.343	.870	18	2.557	.833	18	2.182	.864	17	14.480(.000)**
Retail and sales	2.192	.904	19	2.404	.857	19	2.034	.909	19	13.047(.000)**

*Significant at the 5% level.

**Very significant at the 1% level.

Table 1.
 Importance ranking of knowledge.

Panel 2: Professional skills	Total population N = 306			Certified Public Accountants N = 131			Certified Public Accountants trainees N = 175			F (P)
	Mean	Standard deviation	Rank	Mean	Standard deviation	Rank	Mean	Standard deviation	Rank	
Analytical/Critical thinking	3.692	.558	1	3.694	.509	5	3.691	.593	1	.002(.960)
Oral communication	3.673	.582	2	3.786	.429	1	3.588	.662	4	8.866(.003)**
Foreign language	3.653	.576	3	3.732	.493	3	3.594	.626	3	4.378(.037)*
Written communication	3.627	.620	4	3.709	.488	4	3.565	.698	7	4.084(.044)*
Professional demeanor	3.617	.622	5	3.626	.501	6	3.611	.701	2	.041(.840)
Measurement	3.601	.651	6	3.626	.572	7	3.582	.705	6	.327(.568)
Risk analysis	3.578	.674	7	3.618	.561	8	3.548	.747	8	.801(.371)
Teamwork	3.545	.637	8	3.488	.636	15	3.588	.635	5	1.851(.175)
Continuous learning	3.509	.692	9	3.534	.611	13	3.491	.749	9	.287(.593)
Computing technology	3.500	.678	10	3.557	.570	12	3.457	.748	10	1.633(.202)
Interpersonal	3.483	.697	11	3.564	.569	11	3.422	.775	12	3.127(.078)
Entrepreneurship	3.470	.729	12	3.526	.586	14	3.428	.819	11	1.358(.245)
Decision-making	3.408	.728	13	3.458	.659	16	3.371	.776	13	1.058(.304)
Research	3.388	.739	14	3.580	.594	9	3.245	.803	14	16.088(.000)**
Leadership	3.356	.760	15	3.564	.608	10	3.200	.823	15	18.245(.000)**
Negotiation	3.294	2.419	16	3.755	3.515	2	2.948	.866	20	8.544(.004)**
Project-management	3.232	.729	17	3.351	.619	17	3.142	.793	16	6.204(.013)*
Customer orientation	3.169	.779	18	3.213	.723	20	3.137	.818	17	.723(.396)
Resource-management	3.150	.748	19	3.305	.689	19	3.034	.772	18	10.106(.002)**
Change-management	3.039	.800	20	3.129	.778	21	2.971	.812	19	2.949(.087)
Salesmanship	3.003	.892	21	3.335	.760	18	2.754	.904	21	35.394(.000)**

Panel 2: Professional skills	Total population N = 306			Certified Public Accountants N = 131			Certified Public Accountants trainees N = 175			F (P)
	Mean	Standard deviation	Rank	Mean	Standard deviation	Rank	Mean	Standard deviation	Rank	
Business Decision Modeling	2.846	.833	22	3.084	.702	22	2.668	.880	22	19.763(.000)**

*Significant at the 5% level.

**Very significant at the 1% level.

Table 2.
 Importance ranking of professional skills.

Panel 3: Technological skills	Total population N = 306			Certified public accountants N = 131			Certified Public Accountants trainees N = 175			F (P)
	Mean	Standard deviation	Rank	Mean	Standard deviation	Rank	Mean	Standard deviation	Rank	
Spreadsheet software (e.g. Excel)	3.735	.559	1	3.763	.477	1	3.714	.614	1	.575(.449)
Word processing software (e.g. Word)	3.585	.612	2	3.542	.598	2	3.617	.622	2	1.130(.289)
World-Wide Web searching	3.503	.673	3	3.442	.622	5	3.548	.708	3	1.853(.174)
Systems analysis	3.441	2.878	4	3.519	2.707	4	3.382	3.007	6	.167(.683)
Windows	3.437	.736	5	3.442	.703	6	3.434	.761	4	.010(.921)
Presentation software (e.g. Power Point)	3.392	.726	6	3.412	.642	8	3.377	.784	7	.174(.677)
Database software (e.g. Access)	3.388	.743	7	3.519	.648	3	3.291	.795	8	7.161(.008)**
File & directory management	3.379	.742	8	3.351	.678	10	3.400	.787	5	.324(.570)
Project management	3.303	.827	9	3.412	.711	7	3.222	.897	9	3.963(.047)*
Communication software (e.g. Outlook)	3.261	.766	10	3.381	.717	9	3.171	.790	11	5.728(.017)*
Intra/Extranets	3.225	.859	11	3.282	.777	11	3.182	.916	10	1.005(.317)
Electronic commerce	3.114	.917	12	3.061	.892	14	3.154	.937	12	.772(.380)
Information systems planning & auditing	3.062	.805	13	3.175	.673	13	2.925	.982	15	4.602(.033)*
Technology management & budgeting	3.062	.833	14	3.213	.822	12	2.948	.825	14	7.753(.006)**
Graphics software (e.g. Adobe)	2.957	.924	15	3.000	.841	15	2.925	.982	15	.483(.487)
Other operating systems	2.526	.955	16	2.916	.868	16	2.234	.914	17	43.477(.000)**
HTML programming	2.392	.993	17	2.595	.942	17	2.240	1.005	16	0.871(.002)**
Programming languages	2.303	.913	18	2.427	.804	18	2.211	.980	18	4.231(.041)*

*Significant at the 5% level.

**Very significant at the 1% level.

Table 3.
Importance ranking of technological skills.

Panel 4: Teaching methods	Total population N = 306			Certified Public Accountants N = 131			Certified Public Accountants trainees N = 175			F (P)
	Mean	Standard deviation	Rank	Mean	Standard deviation	Rank	Mean	Standard deviation	Rank	
Assignments with real companies	3.594	.681	1	3.687	.497	1	3.525	.786	1	4.239(.040)*
Team teaching	3.500	.678	2	3.542	.558	2	3.468	.756	2	.876(.350)
Case analysis	3.460	.632	3	3.519	.573	3	3.417	.671	3	1.952(.163)
Team (group) work	3.392	.735	4	3.458	.659	5	3.342	.785	4	1.842(.176)
Role playing	3.392	.799	5	3.503	.672	4	3.308	.875	6	4.520(.034)*
Technology assignments	3.352	.845	6	3.396	.751	7	3.320	.909	5	.620(.432)
Oral presentations	3.150	.787	7	3.442	.609	6	2.931	.834	9	35.130(.000)**
Lecture	3.127	.764	8	3.328	.625	8	2.977	.823	8	16.633(.000)**
Feedback exercises (e.g. Quizzes)	3.101	.759	9	3.221	.682	11	3.011	.802	7	5.818(.016)*
Reading textbooks	3.039	.808	10	3.259	.697	10	2.874	.848	10	17.941(.000)**
Writing assignments	2.993	.805	11	3.267	.677	9	2.788	.834	11	28.851(.000)**
Videos	2.555	.871	12	2.740	.780	12	2.417	.911	12	10.641(.001)**

*Significant at the 5% level.
**Very significant at the 1% level.

Table 4.
Importance ranking of teaching methods.

CPA trainees as the fourth most important skill. It should be noted that CPAs perceive decision-making as a relatively unimportant professional skill (ranked 16th), lower than it was perceived by CPA trainees (ranked 13th). It is also interesting to note that CPA trainees ranked written communication seventh, a skill which practitioners gave a much higher ranking to (fourth most important skill). Other findings seem quite striking, in fact, while some skills are relatively important for CPA trainees, CPAs considered them much less important, for example, teamwork, learning, and entrepreneurship. Conversely, some skills appear to be important for CPAs but not at all for CPA trainees. The most striking example is the one relating to negotiation. Indeed, the group of CPAs perceives negotiation as the second most important professional skill while CPA trainees relegated it to twentieth (**Table 2**).

Turning now to technological skills, responses displayed in **Table 3** show a convergence of opinion between CPA and CPA trainees in the ranking concerning the two most important technological skills. The two groups of respondents find that mastering spreadsheet software and word processing software are the two most important technological skills respectively. However, differences in rankings between the two groups are numerous. For example, while mastering databases is considered the third most important technological skill by the CPA, CPA trainees ranked it eighth. Similarly, world-wide web searching was ranked the third most important technological skill by CPA trainees, but was considered only the fifth most important by CPA. Other differences in ranking between the two groups may be observed, for example, concerning the use of file & directory management and communications software. However, both CPA and CPA trainees agreed that programming languages is the least important technological skill.

With regard to the most important teaching methods, surprisingly, both CPA and CPA trainees identified assignments with real companies, team teaching, and case analysis as the three most important methods. Similarly, the two groups of respondents agreed on the least important teaching method, namely the use of videos. However, **Table 4** highlights some differences in ranking, particularly with regard to role playing, technology assignments, and oral presentations. Finally, it is important to emphasize the importance given to writing assignments by CPA (ranked 9th), while CPA trainees ranked them eleventh.

4.1.2 Findings discussion

Our survey results reveal that respondents recognize the importance of a series of knowledge, skills and teaching methods for the training of future professional accountants in the changing business environment in Tunisia. In particular, respondents have a consistent perception of the top five most important knowledge items. As shown in **Table 1**, the knowledge items perceived as being important are mainly traditional accounting subjects such as auditing, financial accounting, and managerial accounting, while most of the broader types of knowledge received relatively lower scores, for example, ethics and social responsibility, global business, and economics. This result may suggest that the importance of receiving broader knowledge in the accounting education is not fully recognized by the respondents. We can conclude that at present time, accounting education of CPA in Tunisia has a relatively narrow focus manifested in particular by the concentration on traditional or content-mastery knowledge, while multidisciplinary roles such as management and other areas in social sciences and humanities are not sufficiently addressed.⁴

⁴ As **Table 1** shows, most of the broader-type knowledge subjects have received relatively lower scores.

Regarding professional skills, and particularly those ranked highest, it is interesting to note that CPA averages are higher than those of CPA trainees. The two groups of respondents rank oral communication among the four most important skills. This seems to contradict the stereotypical impression of isolated professional accountants recording accounting documents throughout the day. It appears that the respondents understand the interpersonal nature of the accounting environment. It is not surprising that CPA trainees consider written communication as the seventh most important professional skill while the professionals consider it to be more important. In fact, CPAs are more accustomed to writing business reports and audit opinions, and are therefore more likely to consider the importance of such a skill.

At the aggregate level, analytical/critical thinking is one of the three most important professional skills. However, in our context, only the CPA trainees placed it at the forefront. This can be explained by the fact that most CPA trainees of our sample were exposed to situations that require them to think critically.

Mastering foreign languages were unanimously ranked as the third most important professional skill, both for CPA and CPA trainees. This result is not surprising given the current emphasis on globalization. Apparently, the two groups felt that English was the language of business and, therefore, they should master it.

Moreover, CPA trainees gave much more importance to professional demeanor (ranked 2nd) than CPAs (ranked 6th). We can explain this result by the fact that, at the beginning of their careers, CPA trainees are more sensitive to ethics and eventually give tremendous respect to their accreditation body.

The ranking of negotiating skill was very high in the CPA sample. Indeed, they regard it as the second most important professional skill because, after many years of practice, they are able to recognize that negotiation plays a major role in their everyday life. Conversely, CPA trainees are still at the level of their internship and haven't faced such situations yet. In the course of their internship, they are assigned tasks that do not require the use of negotiation, for example, bookkeeping and auditing.

The ranking of respondents regarding the five least important skills show less striking diversity than at the level of the five most important skills. Actually, both groups of respondents ranked the following items: customer orientation, resource-management, change-management, salesmanship, and business decision modeling, close together and were unanimous regarding their importance. The results also show that customer orientation is not considered as a very important skill for both CPA trainees and CPAs. This seems surprising on the part of the CPA who work in firms that depend on their customers. Therefore, they should take more account of the present and future needs of their customers and should meet their requirements and strive to meet their expectations. Change management was considered more important by trainees than by practitioners. This result is surprising since practitioners have had experience in the real world and should therefore be aware that change is part of life. Despite their young age, CPA trainees are aware that all companies must evolve in order to survive in today's dynamic environment.

The rankings of technological skills highlight the agreement of CPA and CPA trainees regarding the importance given to spreadsheet software and word processing software. Thus, this result shows the importance of the use of spreadsheet software and word processing software in the daily tasks that Tunisian professional accountants are required to carry out, including bookkeeping and the preparation of audit reports. However, it appears that the two groups of respondents do not share the same opinion when it comes to world-wide web searching. CPA trainees give more importance to web searching. This finding could be explained by a shift between two generations. The new generation of Tunisian

professional accountants gives more importance to web searching. They therefore understood the relevance of search engines when it comes to seeking information. While it seems that CPA prefer using more conventional means when it comes to looking for information. HTML programming and programming languages do not appear to be important for the two groups of respondents. We can explain this result by the existence of programming experts who are more likely than professional accountants to carry out programming.

Finally, concerning the teaching methods in accounting education, both groups of respondents have similar views on the importance of the various methods. One notable difference is that practitioners have given greater weight to writing assignments compared to feedback exercises (e.g. Quizzes), while CPA trainees have an opposite point of view. This may be interpreted by the fact that Tunisian CPA trainees should be aware of the importance of the written communication skills that CPA need (ranked 4th).

4.2 Comparative study

After having studied the perceptions of the Tunisian respondents about their needs, we will now offer a comparison of the perceptions of the importance of knowledge, professional skills, technological skills, and teaching methods for professional accountants coming from different economic and cultural environments. **Table 5** shows the ranking of the different components of the knowledge, skills, and teaching methods items. The ranking order is determined by the average score of the perceived importance of each item or component. The Tunisian sample data were collected from our survey. U.S. and Chinese data results from studies conducted by Albrecht and Sack [2] and by Lin *et al.*, [37] respectively (data for accounting practitioners). Some differences in the perceptions of the importance of knowledge, professional and technological skills and teaching methods among Tunisian, Chinese and Americans respondents must be noticed.

According to **Table 5**, the ranking of the first three knowledge items is relatively uniform for both American and Chinese samples, namely financial accounting, taxes, and finance. Gaps exist for other knowledge items. For example, there are considerable differences in the ranking of information systems, business law, ethics, and social responsibility. Indeed, information systems was ranked as the second most important knowledge item by U.S. practitioners [2], but ranked eighth by Chinese respondents [37], and placed sixth by professional accountants in Tunisia. This difference is probably due to the fact that information systems are much less developed in China and Tunisia than in the United States. Thus, the Tunisian respondents could not give the same high ranking for this item as their counterparts in the United States. In addition, business law which was classified by Chinese practitioners as the sixth most important knowledge item and by their American counterparts as the tenth most important one has been ranked by Tunisian practitioners as the fourth most important knowledge item. The reason for this may be due to the importance given by the Tunisian accounting profession to the issues of rights. Thus, business law is, at present, considered a very important component of the accounting education in Tunisia.

Another difference to note concerns ethics and social responsibility, which were ranked as the fifth most important knowledge item by Chinese practitioners, the twelfth most important by U.S. practitioners [2] and the fourteenth most important knowledge item by Tunisian practitioners. Such a difference can be explained by the fact that the accounting profession at the worldwide level has established a major emphasis on ethics and social responsibility in recent years. This happened as a response to public concerns following the Enron and Arthur Andersen case at the

Professional accountants			
	Tunisia: Khemiri, 2012	China: Lin & al, 2005	USA: Albrecht & Sack, 2000
Panel 1: Knowledge			
Taxes	1	2	3
Auditing/Assurance services	2	7	6
Financial accounting	3	1	1
Business law	4	6	10
Managerial accounting	5	4	7
Information systems	6	8	2
Finance	7	3	3
Technology topics	8	10	8
Business strategy	9	14	5
Electronic commerce	10	13	9
Statistics/Quantitative methods	11	17	14
Organizational behavior/Human resource management	12	16	17
Accounting research methods	13	—	15
Ethics and social responsibility	14	5	12
Operations/Supply-chain management	15	18	16
Global/International business	16	12	11
Economics	17	9/11 ¹	13
Marketing	18	15	18
Retail and sales	19	19	—
Panel 2: Professional skills			
Analytical/Critical thinking	1	4	2
Oral communication	2	8	3
Foreign language	3	9	22
Written communication	4	3	1
Professional demeanor	5	1	10
Measurement	6	—	20
Risk analysis	7	—	13
Teamwork	8	6	5
Continuous learning	9	—	9
Computing technology	10	2	4
Interpersonal	11	7	7
Entrepreneurship	12	14	19
Decision-making	13	5	6
Research	14	1	18
Leadership	15	10	8
Negotiation	16	15	15
Project-management	17	11	10

Professional accountants			
	Tunisia: Khemiri, 2012	China: Lin & al, 2005	USA: Albrecht & Sack, 2000
Customer orientation	18	16	16
Resource-management	19	12	17
Change-management	20	17	14
Salesmanship	21	18	21
Business Decision Modeling	22	13	12
Panel 3: Technological skills			
Spreadsheet software (e.g. Excel)	1	—	1
Word processing software (e.g. Word)	2	—	3
World-Wide Web searching	3	—	4
Systems analysis	4	—	15
Windows	5	—	2
Presentation software (e.g. Power Point)	6	—	6
Database software (e.g. Access)	7	—	8
File & directory management	8	—	6
Project management	9	—	11
Communication software (e.g. Outlook)	10	—	10
Intra/Extranets	11	—	16
Electronic commerce	12	—	12
Information systems planning & auditing	13	—	12
Technology management & budgeting	14	—	14
Graphics software (e.g. Adobe)	15	—	19
Other operating systems	16	—	20
HTML programming	17	—	21
Programming languages	18	—	22
Panel 4: Teaching methods			
Assignments with real companies	1	3	2
Team teaching	2	—	8
Case analysis	3	2	5
Team (group) work	4	—	3
Role playing	5	7	7
Technology assignments	6	4	1
Oral presentations	7	—	6
Lecture	8	—	12
Feedback exercises (e.g. Quizzes)	9	—	10
Reading textbooks	10	—	11

Professional accountants			
	Tunisia: Khemiri, 2012	China: Lin & al, 2005	USA: Albrecht & Sack, 2000
Writing assignments	11	5	4
Videos	12	—	9

¹According to the study of Lin et al. [37], item economy was split in microeconomics (ranked 9th) and macroeconomics (11th).

Table 5.
Importance ranking of Tunisian, Chinese and American accounting practitioners.

beginning of 2001. So, it seems that Chinese have recognized the ethics and social responsibility as a very important knowledge item for accounting education. Obviously, Tunisian practitioners are still not aware of the importance of such knowledge in accounting education.

In addition, as shown in panel 2 of **Table 5**, there are considerable differences in the perceived importance of the professional skills necessary for professional accountants in the Tunisian, Chinese and American contexts. The major items which received scores of varied importance by Tunisian, Chinese and Americans respondents are especially analytical/critical thinking, professional demeanor, foreign language, computing technology, communications (written and oral), decision-making, change-management and research. Thus, while Chinese respondents gave information technology a higher rank than American respondents did, Tunisian respondents, for their part, assigned it a rank lower than that of the Americans and Chinese (ranked 10th). This ranking by the Tunisian professionals seems surprising because computerization is now gaining ground in Tunisia. Indeed, the level of computer culture is high in Tunisia and such skills may have been taken for granted by Tunisian professional accountants. Similarly, professional demeanor is ranked by Tunisian respondents as the fifth most important skill, while Chinese practitioners put it in first place and American practitioners only in tenth place [2]. The difference may be due to the different business environments of the three countries. Further, as the accounting profession is less mature in Tunisia, Tunisian respondents may feel that it is important to develop professional demeanor to improve the social status and reputation of the Tunisian accounting professionals.

Foreign languages are ranked ninth by the Chinese, while it was perceived as the least important professional skill by American practitioners. However, the Tunisian practitioners put it in the third place. Since the gradual integration of the Tunisian economy in the world market, especially after the entry of Tunisia in the World Trade Organization (WTO) in 1995, mastering foreign languages has become a very important professional skill and one that is useful for Tunisian professional accountants, allowing them to work for foreign clients or Tunisian companies which possess subsidiaries abroad or working in cooperation with foreign companies. Regarding the American CPAs' ranking of foreign languages, it is possible that respondents consider the English language to be the universal language of business and that communications around the world are generally made in English. Therefore, they minimize the value of foreign languages by considering them to be useless.

Critical thinking, oral, as well as written communications are considered in the Albrecht and Sack [2] study to be the three most important professional skills in the eyes of American professionals. This view is shared by Tunisian professionals. Chinese respondents, however, give these skills relatively low ranking. This finding

may reflect the fact that accounting practices and transactions are quite complicated, so Tunisian professionals employ the analytical and critical thinking and professional judgment in their practice. In addition, the high rankings given to oral and written communication by Tunisian respondents seem surprising. Indeed, this result contradicts the influence of the eastern culture in which individuals are supposed to be humble and must strictly obey the orders or instructions of their superiors. In such a cultural context, bidirectional communication is generally not encouraged and the value of communications skills could be underestimated. These skills are crucial for accountants in a changing and dynamic business world and they should take a greater role in accounting education in Tunisia.

Regarding technological skills, only the U.S. and Tunisian professionals have expressed themselves about their perception of the level of importance of such skills. Moreover, it is interesting to note the convergence of the two groups of respondents particularly at the level of the ranking of the most important technological skills and the least important. On the one hand, U.S. and Tunisian practitioners agree on the importance of spreadsheet software, word processing software and world-wide web searching for the accounting profession. It seems that these three technological skills are widely used in the daily tasks of the practitioners. In addition, this consistency in the perceptions of importance of the two groups of respondents may reflect the level of computerization among the Tunisian accounting professionals who seem seduced by its multiple benefits: speed, reliability, traceability, inventory management, paper saving and teleconsultation of documents. On the other hand, the two groups of respondents pointed the same technological skills which appear to them to be least important for accounting practice. This is the case, for example, for HTML programming and programming languages. It seems that these skills are considered overly technical specialties for professional accountants and that it is more appropriate to employ a specialist when necessary.

Lastly, the perceived level of importance of teaching methods by U.S., Chinese and Tunisian professionals reveals some differences. While Tunisian respondents rank team teaching second, American respondents rank it eighth. In addition, technology assignments are considered by American practitioners as the most important teaching method. Chinese practitioners rank it fourth, while Tunisian practitioners rank it only sixth. This result shows that the use of technology is part of the American educational landscape. It helps to explain the importance given by American professionals, on the one hand, to technology as being one of the ten most important knowledge items and, on the other hand, to computing technology as being the fourth most important professional skill. We can also notice that Tunisian professionals have not been made sensitive to the completion of technological skills; this could be due to the fact that technological tools have not yet made their appearance in the accounting education of CPA. Similarly, respondents do not agree on the importance of writing assignments. While American professionals believe that writing assignments are the fourth most important pedagogical method, Chinese and Tunisian respondents ranked them seventh and eleventh respectively. Such a result confirms the importance given to written communications by American practitioners (ranked the most important skill), which is not the case for other respondents. So, it seems that writing assignments help to initiate the future professionals in the writing of numerous reports that they will be required to carry out, for example, audit reports.

However, the three groups of respondents have similar views in terms of the perceived importance of assignments with real companies, team (group) work, and role playing. These different methods enable developing certain skills required for the accounting practice. For example, assignments with real companies can develop the critical and analytical mind of students. Team teaching could teach students

leadership and importance of collaboration. And role-playing introduces students to negotiation. The use of textbooks doesn't seem to be an important teaching method for both American and Tunisian professional accountants. Indeed, the use of textbooks seems to be abandoned in favor of other methods that extend the scope of knowledge and also have the possibility of updating.

5. Conclusion

Major changes in the environment of affairs throughout these last decades have greatly impacted the accounting profession. The development of globalization and technology has resulted in new requirements for professional accountants. For example, these needs are reflected in the emergence of new missions with high added value, whose demand is ever increasing, such as consulting and opinion services. To carry out these new missions, professional accountants must get an academic education that enables them to develop new competencies (knowledge and skills). The identification of these competencies has been the subject of both academic [6, 11, 28, 37, 38] and professional studies [5, 12, 25, 50].

All the studies converge and identified a set of knowledge and skills as well as technical, personal [51], and in the field of Information and Communication Technology (ICT). Technology forces today are significantly changing many professions, including the accounting profession. Hood [52] reports the result of interviews with thought leaders throughout the accounting profession, noting their three "biggest nightmares:" (1) technology-induced changes that devalue longstanding core services of the profession, (2) finding new employees with the right mix of skills and retraining current employees who need new skills, and (3) keeping up with the pace of technology change [52]. Further evidence of the impact of technology forces on the accounting profession may be seen in significant offshoring of tasks (to lower costs) and increasing automation of accounting/finance jobs. The result is an increasing skills gap in accounting/finance [1]. However, if the Anglo-Saxon countries, including the United States, were the first to respond to this new economic situation in adopting educational systems capable of providing the future professional knowledge and skills mentioned above, Tunisia, for its part, has set up a higher education system on the License-Master-Doctorate model, without so far, providing a specific accounting educational path for CPA. Can we say that the current system of CPA education in Tunisia is adapted to the needs of the accounting profession?

We conducted a survey on Tunisian CPA and CPA trainees. The results revealed a range of knowledge, skills and teaching methods considered to be the most important. The results also highlight similarities in the perception of knowledge and skills required by professional accountants, whether they are Tunisians, Chinese or Americans. Differences of perception are probably due to the differences in terms of economic and technological development, as well as social and cultural influences that differ from one country to another. Thus, this research has helped to form two convictions. The first one is that we must continue to think about the pedagogy to adopt in the context of accounting education, as well as the manner in which the knowledge is transmitted [11, 51]. The second is that academic accounting education curriculum plays a crucial role to meet the needs of the profession and influences the development of the profession.

In conclusion, this work cannot claim to have responded to all issues related to the problems and challenges facing accounting education, even less to have found the solutions. One of the main objectives of this study was to try to put the problem in its context and to propose a model for analyzing the situation. Academics in the

field of accounting face the challenge of repositioning their discipline in a position of excellence. Indeed, the accounting discipline should be organized in order to benefit from the experience gained particularly over the last decades, to evolve and adapt to new challenges and new expectations of the accounting profession. This can be accomplished only if the academic world agrees to abandon its conformity and its commitment to traditional teaching methods. It is obvious that in the current state, higher education institutions have no choice than to change their methods. The costs associated with the implementation of these changes are much lower than the costs that would be generated by a possible lack of action.

Conflict of interest

“The author declares no conflict of interest.”


Author details

Rim Khemiri

Center for Interdisciplinary Research in Social Sciences-CRISS, University
Polytechnic Hauts-de-France, Valenciennes, France

*Address all correspondence to: rim.khemiri@uphf.fr

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