

Skills, Knowledge, and Attitudes Important for Present-Day Auditors

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Recent accounting scandals have challenged and transformed the present-day role of auditors, making it timely and important to re-examine the skills, knowledge, and attitudes (SKAs) required of auditors in today's business environment. While prior studies have examined SKAs of accountants and internal auditors, and personal attributes of auditors, there is little research on auditors' SKAs. We propose and examine 20 SKAs important to present-day auditors. We survey experienced auditors in Singapore about the importance of these SKAs. Our participants rate professional integrity, assessing audit evidence, and having a questioning mind (indicative of professionalism competency) as the three most important SKAs. The participants also assess entry-level auditors' (ELAs) performance for each SKA. The difference between their importance and performance ratings is largest for business competency, particularly for knowledge of client's business. Our findings have implications for various accounting constituencies in terms of developing auditors' competencies.

Key words: Skills, knowledge, attitudes, competencies, importance-performance gap, auditors

INTRODUCTION

Every year since the turn of the millennium, at least one highly publicized accounting scandal has been reported somewhere in the world. While the epicenter of these scandals is in the US in the 2001–2002 time period (with the Enron and WorldCom scandals), many other countries have witnessed at least one scandal during the current millennium. Some examples of accounting scandals that occurred outside the US are One.Tel (Australia), Parmalat (Italy), Royal Ahold (Netherlands), Nortel (Canada), ComRoad AG (Germany), Satyam Computer Services (India), Sino Forest (Canada/India), La Polar (Chile), and Olympus (Japan). Often, accounting scandals are associated with audit failures.

A common question that follows any accounting mishap is 'who is to blame?' Often, the blame for accounting scandals has been (and still is) on auditors (Alsop, 2003; Merritt, 2003; Lumb, 2012), despite the acknowledgement by both auditing regulators and researchers that audit quality is a joint function of auditor and auditee (Antle & Nalebuff, 1991). According to Curd and Thorpe (2008), while auditors have no obligation to prevent fraud, they have an obligation to detect fraud, so that it would not continue. While detecting fraud is neither the only nor the main duty of auditors, society is getting tired of hearing about accounting scandals year after year. As a result, at the minimum, society expects auditors to carry out the duties expected of the profession. Therefore, the follow-up question (after asking who is to blame) relating to accounting scandals is: 'Did the auditors carry out their duties and obligations competently, diligently, and objectively?' According to the International Federation of Accountants (IFAC), 'the objective of the auditor is to identify and assess the risks of material misstatements, whether due to fraud or error' (IFAC, 2010c, p. 264). Undoubtedly, with the increasing occurrence of scandals and audit failures throughout the world, the performance of auditors is under greater scrutiny by both the regulators as well as the public

(Gandel, 2008; Johnson, 2010; Nuthall & Verma, 2011). While establishing whether or not auditors are to blame for accounting scandals is beyond the scope of this study, identifying the skills, knowledge, and attitudes (SKAs) that auditors need to discharge their duties competently, diligently, and objectively in the current business and regulatory environment is the focus of this study. In this study, we pay specific attention to the current audit environment – one where the auditing profession is more stringently regulated and society places higher expectations and responsibilities on auditors than it has ever before. We are also interested in knowing the order of importance for the SKAs examined. Another question that our study aims to answer is, 'How well do entry-level auditors (ELAs) perform in each of the SKAs?'¹

Given the fluidity of audit-related regulations and the frequency of accounting scandals, one would think that these questions must have been addressed before. To our surprise, we find that the auditing literature is void of studies on auditors' SKAs; the accounting literature contains only competency studies of accountants, internal auditors, and management accountants. Auditing research has focused on topics to be covered in a university's auditing courses and on personal attributes (also referred to as personality traits or personal characteristics) of expert auditors. Needless to say, accounting competency studies do not examine auditors' SKAs. Furthermore, we believe that extant audit attribute studies will not undermine the importance of our study for two reasons. Firstly, all auditor attribute studies were conducted before Enron and other major accounting scandals, and the regulatory changes that followed. Therefore, these studies may not reflect the demands that the new auditing environment has placed on the auditing profession. Secondly, personal attributes considered in prior studies are built on an inventory of psychological characteristics of experts developed by Shanteau (1987). Medical research clearly distinguishes the difference between innate abilities (produced by the mind or which are inherent) and acquired skills (Hollandar, Holland & Atthowe, 1988; Suksudaj *et al.*, 2012). Personal attributes considered in prior studies are largely innate abilities. Tan and Libby (1997) also agree that personality attributes are

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nearly immutable. As the intended contribution of this study is to provide information useful to higher education institutions for curriculum design, and professional bodies and firms for training program design, we focus on attributes that can be acquired (learned), developed and improved – skills, knowledge, and attitudes.

Reasonably or unreasonably, society expects higher education institutions to shoulder the responsibility for developing the SKAs that are important for the auditing profession. Reporting on a survey of curriculum, course content, and instruction methods at 188 US universities and colleges, Johnson *et al.* (2003, p. 262) state that ‘the evidence from current course syllabi suggest that change in auditing education is occurring more slowly and less comprehensively than the demands of both academic reformers and recent events affecting the profession would dictate.’ The ability of higher education institutions to deliver what the profession expects depends on the academics’ understanding of ‘customers’ needs’. Before understanding the customers’ needs, it is important to identify the customers. Quinn *et al.* (2009) argue that a major barrier to improvement efforts in higher education is actually defining the higher education system’s customers. Crawley *et al.* (2007) identify four primary constituencies in engineering education: students, university faculty, industry, and society. Even though Crawley *et al.* (2007) specifically refer to engineering education, the four constituencies are applicable to other disciplines as well. Although students are the immediate customers of higher education, they may not be fully aware of what is expected of them in their future professions. Thus, we consider it useful to view the auditing profession (i.e., industry) as the ultimate customer in our study. One can also argue that the clients (of the auditing firm) are the ultimate customers. Chaffey, Van Peurse and Low (2011, p. 154) highlight the importance of understanding the industry needs as ‘coming to an understanding of what professional and experienced auditors see as being important can lend guidance to such teaching changes as deciding what material is most important and identifying the best methods by which to encourage learning.’ In their opinion, studies that seek the views of professionals may contribute to what is important for auditing education from an ‘outcome’ perspective.

Prior researchers have admitted that the educational experience that future auditors receive in their tertiary study is important because it lays the pedagogical foundation (Johnson *et al.*, 2003). However, auditing is a profession that is built on knowledge as well as training. Marriott *et al.* (2011, p. 136) state that auditor competencies are developed through examination-based learning (which refers to instruction at an educational institution) and work-based training (which refers to instruction from in-house courses and experience gained from practice and feedback). Therefore, auditing firms have a responsibility in developing the SKAs of the auditors as well. In addition, in many countries, one must obtain a professional qualification (such as certified public accountant or chartered accountant) to practice as an auditor. Therefore, it is arguable that professional bodies are also responsible for developing the competencies of auditors.

This raises the question then, who is responsible for developing which SKAs in auditors? There are just too many unanswered questions to be left to speculation.

Therefore, it is obvious that a global study of auditors’ SKAs is timely, if not overdue. However, given that there are no prior studies on auditors’ SKAs, we start by developing a preliminary list of SKAs and testing it in a questionnaire administered on a group of auditors in Singapore. Given that our study is a preliminary investigation, future research will be needed to refine the identified SKAs and test their generalizability to different contexts.

Singapore, officially the Republic of Singapore, is a Southeast Asian city-state. According to the Xinhua-Dow Jones International Financial Centres Development Index, Singapore is ranked as the world’s fourth top financial center (Xinhua-Dow Jones, 2011). With a strong multinational business presence, the business environment in Singapore reflects the global business environment. In addition, Singapore accounting standards are closely modeled after the International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS) issued by the International Accounting Standards Board (IASB). According to Favere-Marchesi (2000), Singapore has a rather sophisticated financial market. Singapore auditing standards closely replicate the International Standards on Auditing (ISA). The Accountants Act of Singapore provides the legislative framework pertaining to the qualifications required to become a public accountant in Singapore. Qualifications include an academic qualification, practical experience, and continuing professional experience (ACRA, 2007). Its well regulated financial sector and adherence to IFRS and ISA make Singapore an ideal place to conduct a pilot study related to auditor competencies. However, one should be aware that until 2013, Singapore did not require professional entry examinations for qualification as public accountants. Instead, academic qualifications could be fulfilled through a degree or diploma in accounting as well as completion of examinations administered by other recognized professional accounting bodies (ACRA, 2007).² The tertiary curriculum in Singapore is firmly grounded in the same principles as those in other developed countries. For example, the Bachelor of Accountancy program at the Nanyang Business School adopts a seminar pedagogy and requires eight foundational core courses plus nine accountancy specialization courses. The program is comparable to many accounting undergraduate programs offered in the US, and it is accredited by both AACSB (Association to Advance Collegiate Schools of Business), and EQUIS (European Quality Improvement System) as well as various professional accounting bodies in Singapore, the United Kingdom (UK), and Australia.

The findings of our study can contribute to various auditing constituencies in the following manner: higher education institutions can develop pedagogies and curriculum to focus on the most important SKAs identified in the study; auditing firms and professional bodies can develop training programs to develop auditors’ SKAs in areas where there are significant gaps between importance and performance; and accounting students can take steps to acquire and improve the SKAs that are identified as most important. The general public may, ultimately, see a decrease in audit failures with improved auditor competencies when all constituencies make efforts to improve teaching and learning related to auditors’ SKAs.

According to the survey results, we find that professional integrity is the most important SKA.

Assessing audit evidence and having a questioning mind are ranked as the second and the third most important SKAs. All three SKAs relate to the professionalism competency, and SKAs related to professionalism competency have not been identified in extant auditing studies, which focus largely on personal attributes attributed to experts. While some studies included knowledge as an attribute, specific knowledge areas were not examined. Prior studies examining university-level auditing courses included only auditing topics (knowledge areas) and excluded skills and attitudes. Factor analysis shows that the remaining SKAs map into four distinct auditor competencies: core audit competency, advanced audit competency, managerial competency, and business competency. We also find that the audit supervisors rate the ELAs' performance in most SKAs and competencies as above average. Amongst all the SKAs examined, professional integrity received the highest performance rating. However, assessing audit evidence, ability to understand client's business, and knowledge on double-entry, which are among the most important SKAs, are not among the SKAs that received the highest performance ratings. The gaps in importance and performance ratings suggest the need for various constituencies to review and consider which SKAs are important and what can be done to improve them to advance the auditing profession. For example, ELAs' performance in business competencies, and in particular knowledge of client's business, can be enhanced through industry-specific training and greater mentoring by more senior auditors.

In the next section, we review extant studies on accounting competencies, audit experts' attributes as well as topics considered important in auditing education. The two sections that follow discuss our research questions and methodology. We conclude with a discussion of our findings and their implications.

LITERATURE REVIEW

Concern about how well an accounting education prepares students for professional careers in accounting were expressed as early as more than half a century ago. Palmer, Ziegenfuss and Pinsker (2004) review a few of the studies on this topic conducted in the 1960s and 1970s. They also compare eight accounting competency studies published in the late 1980s to early 2000s. Of the eight studies, three study the competencies of management accountants (Siegel & Sorensen, 1994, 1999; Siegel & Kulesza, 1996) and one studies the competencies of internal auditors (IAA, 1999), while the others study the generic competencies of accountants. In addition to the eight studies mentioned by Palmer *et al.* (2004), Deppe *et al.* (1991) examine new competencies required of accountants given the advancing technology, proliferating regulations, increasing commercial globalization, and increasing transaction complexity. Lee and Blaszczyński (1999) survey Fortune 500 companies to study the relative importance of five skills to accountants. Kavanagh and Drennan (2008) report an Australian study on accounting students' and employers' perceptions about the attributes and skills that are important for a career in accounting.

Other studies (Abdolmohammadi & Shanteau, 1992; Libby & Tan, 1994; Tan & Libby, 1997; Abdolmohammadi, Searfoss & Shanteau, 2004) extensively examine attributes of audit specialists and experts. These studies are referred

to as 'audit expert attribute studies' hereafter. Abdolmohammadi and Shanteau (1992) focus on personal attributes (that the authors refer to as psychological characteristics or behavioral traits). Identifying and ranking personal attributes are important for auditing firms in developing expert systems and training programs, determining hiring guidelines, and specifying evaluation and promotion policies. The inventory of attributes examined by Abdolmohammadi and Shanteau (1992) is based on attributes of expert decision makers developed by Shanteau (1987), which are not necessarily unique to auditors. Abdolmohammadi *et al.* (2004) examine attributes of top industry audit specialists. This 2004 study includes all attributes considered in the Abdolmohammadi and Shanteau (1992) study plus eight new attributes (configural processing, feedback, intelligence, pattern recognition, problem solver, quick thinker, research skills, and task analysis). In addition, based on an open-ended questionnaire, 32 commonly listed attributes are identified. These attributes included judgment/technical expertise as well as personality/social attributes. Knowledge is identified as the most important attribute, but specific knowledge areas are not identified. Even with the expanded list, most of the attributes in Abdolmohammadi *et al.*'s (2004) study are behavioral traits.

Tan and Libby (1997) expand the concept of expertise to include managerial dimensions and examine the importance of managerial and technical knowledge, and problem-solving ability to audit experts at different organizational levels. According to Tan and Libby (1997, p. 100), '(m)anagerial knowledge is tacit; it is largely unarticulated, is not directly taught in school, and is presumably learned from experience'. They do not identify any specific SKAs.

Tan (1999) examines auditors' attributes that are important for superior performance at different organizational levels. Note that Tan's (1999) study is not an audit expert attribute study. He examines 20 attributes, of which nine are adopted from Abdolmohammadi and Shanteau (1992) and the rest are selected based on the performance measurement criteria adopted by Big-Six accounting firms in Singapore. McKnight and Wright (2011) also examine the characteristics of relatively high-performance auditors. Reporting on a US-based study, they confirm that high-performing auditors have superior technical knowledge, better client interaction skills, and superior professional attitudes and behaviors compared to their peers. They do not identify any specific knowledge, skills, or attitudes. McKnight and Wright also report that high-performance auditors rely less on standard audit procedures and have an internal locus of control. The results of their study are based on CPA firm-reported and self-reported job performance evaluations. Crawford, Helliard and Monk (2011) examine the generic skills that ought to be covered in audit education. They report the perceptions of academics and members of three professional bodies in the UK.

Armitage (2008) reports an auditing survey, which is neither on auditors' competencies nor on audit experts' attributes. It is a study of the importance of auditing topics covered in undergraduate auditing courses in universities. Hereafter, we refer to such studies as 'audit topic studies'. Utilizing two world-wide surveys (conducted in 2000 and 2005) of auditing professors, Armitage (2008) identifies how auditing professors rank the importance of 41 topics

typically included in the first auditing course. In addition, since the second survey is conducted five years after the first one, Armitage (2008) identifies significant changes in the importance of topics. According to Armitage (2008, p. 957), '(t)he five most important topics identified in the 2005 survey are audit risk, understanding internal control structures, types and sources of evidence, standard audit reports, and financial statement assertions. The five most important topics identified in the 2000 survey are types and sources of evidence, audit risk, standard audit report, materiality, and understanding internal control structures.' He also summarizes findings of three other audit topic studies that examine auditing professors' perceptions (Engle & Elam, 1985; Bryan & Smith, 1997; Johnson *et al.*, 2003). Interestingly, the findings of five audit topic studies do not reveal a consistent pattern. Except for internal controls and types and sources of audit evidence, no other topic appears at the top in all five studies. Even internal controls and audit evidence have different importance rankings in different studies. Armitage and Poyzer (2010) extend Armitage's 2008 study to capture practitioners' perspective of the same 41 topics. The five most important topics identified by practitioners are audit risk, documentation, ethics, internal controls and analytical procedures. Audit evidence, which appears on the academics' top five topics in all five audit topic surveys, is not in the top five topics identified by practitioners.

Given that the accounting scandals in the new millennium have raised doubts about the trustworthiness and competency of auditors, resulted in increased demands on auditors' responsibility and accountability, and led to more auditing standards and regulations (especially in the US and UK), it is surprising that there are no studies on the SKAs that are important to auditors in the new millennium (except for one study done in Turkey). To fill the void, we develop a list of SKAs that are specifically important to the present-day auditors instead of just relying on the generic inventory of SKAs used in prior accounting competency, audit expert attribute, and audit topic studies.

RESEARCH QUESTIONS

Research question 1: What SKAs are regarded as critically important for the effectiveness of auditors?

Answering the above question involves two steps: (1) coming up with a list of SKAs that is important to auditors, and (2) ranking the SKAs according to practitioners' perceptions of their order of importance. We first describe the SKA selection process.

Since Palmer *et al.* (2004) provide the most comprehensive literature survey on accounting competency studies, we first consider the seven SKAs that they identified as important for accountants (communication, interpersonal, general business knowledge, accounting knowledge, problem-solving skills, information technology, and attitudes, capabilities and professionalism) to see if those SKAs are relevant for the scope of our study. All seven SKAs mentioned above are also included in Tan's (1999) study of attributes necessary for superior audit performance.³ Of the seven SKAs that have been previously examined, only the first six are included in our study with some terminology

modifications.⁴ We exclude attitudes, capabilities, and professionalism as we plan to replace it with more specific professional attitudes and capabilities that are important for auditors. Note that the six SKAs that we have selected from prior studies are also among the competencies identified in Kullberg *et al.* (1989). In addition to these six SKAs, our study includes ten new SKAs, which are discussed next.

New SKAs examined

- 1. Professional integrity:** Integrity and ethics are often mentioned together in the business literature (Pritchard, 2006). AACSB has stipulated that the undergraduate degree should include lessons on ethical understanding and even stated the areas of focus (Beggs & Dean, 2007). Becker, Haugen and Mattson (2005, p. 13) note that '(a)uditors have allegedly helped clients hide unfavorable financial information, ignored evidence of fraudulent financial reporting, and broken their own Code of Professional Conduct, among other transgressions', and discuss the importance of continuing education in ethics to improve the professional conduct of auditors. Professional integrity encompasses attitudes and professionalism, but it excludes capabilities. Neither integrity nor ethics is included as an attribute in prior audit expert attribute studies.
- 2. Professional skepticism:** According to ISA 200, auditors should plan and perform audits with professional skepticism, recognizing that circumstances might exist that may cause the financial statements to be materially misstated (IFAC, 2010a, p. 78). According to Beasley, Carcello and Hermanson (2001), 60 percent of Securities and Exchange Commission's (SEC) enforcement actions in the US between 1987 and 1997 were a result of a lack of professional skepticism. Similarly, a Public Company Accounting Oversight Board's review notes that deficiencies in the eight largest US accounting firms are due to a lack of professional skepticism (PCAOB, 2008). The importance of professional skepticism is evident in other countries as well. The Auditing Practices Board of the UK Financial Reporting Council (FRC) has released a discussion paper on professional skepticism (FRC, 2010). Sections A18–A22 of Australian Accounting Standards Board's (AASB) Auditing Standard Australia (ASA) 200 is on professional skepticism (AASB, 2009).

Even though there are no reports on lack of professional skepticism in Singapore, according to the 2009 annual Practice Monitoring Program (PMP) report published by the Accounting and Corporate Regulatory Authority (ACRA) of Singapore, in response to the challenging times facing the corporate governance community, Singapore auditors have lifted their professional skepticism, extended audit procedures, and identified key concerns in financial audits (ACRA, 2009). Therefore, professional skepticism is an important skill for auditors in Singapore and many other countries.

According to both US and international auditing standards, professional skepticism comprises both a questioning mind and a critical assessment of audit evidence (PCAOB, n.d.; IFAC, 2010a). As mentioned

earlier, all five prior studies on audit topics have identified audit evidence as an important topic in auditing education; but none has included a questioning mind. Perhaps, this is because a questioning mind is not a piece of knowledge that can be effectively imparted through a course. Since the scope of our study is broader (covering skills and attitudes, not merely knowledge), we include both dimensions of professional skepticism in our survey: (1) **questioning mind** and (2) **ability to assess audit evidence**.

3. Negotiation skills: If an auditor is unwilling to provide an unqualified opinion on management's stated representations, then auditor and client begin negotiations, during which the auditor may offer a revised statement (Antle & Nalebuff, 1991). While auditor–client negotiations usually occur between audit partners or managers and chief financial officers, auditors of all hierarchical levels may have situations where they need to negotiate with their clients (or their appointed managers). This is especially so when there is a need to improve audit efficiency or when time pressures are involved (Gibbins, McCracken & Salterio, 2007). Thus, we include negotiation skills as one SKA that auditors should possess in order to conduct audits effectively.

4. Ability to understand client's business: Many auditors now adopt an audit methodology that requires a strategic risk assessment of their client's business model as a first step for assessing business risks (O'Donnell & Schultz, 2005). During the strategic assessment, auditors focus on the organization's overall prospects, including its strategy to create value for customers (Eilifsen, Knechel & Wallage, 2001). When employees and managers take improper actions that adversely affect organizations, fail to identify and respond properly to changes in the business environment, or misalign strategic objectives and business processes, it may result in fraudulent financial reporting. In order to detect the fraudulent behaviors, it is important that auditors have a holistic understanding of the client's business. According to Eilifsen *et al.* (2001), a major challenge for auditors is to link the knowledge gained about client's strategy and competitive advantage (i.e., knowledge of client's business), and the resulting business risks to the fairness of the client's financial statements. Bell *et al.* (1997) argue that auditing should evolve to a strategic systems view of an organization with an in-depth understanding of the organization's strategies, threats, and risk responses. We therefore include ability to understand client's business as a SKA in our study. Note that Tan (1999, p. 82) includes client knowledge in his study of audit attributes necessary for superior performance, which he defines as 'a good knowledge of client's business, and short- and long-term needs.' He also believes that a good knowledge of the client can be acquired through experience (via recurring audits of the same client). However, our focus is not on the client knowledge gained through experience but rather on the *ability* to understand a client's business, even if it is a new client.

5. Risk assessment knowledge: Traditionally, auditors have used a risk-based approach in order to

minimize the possibility of issuing an inappropriate audit opinion. Owing to the new emphasis on business and process risks, auditors are now urged to consider a broad array of risks potentially affecting a client organization (Bell *et al.*, 1997; Eilifsen *et al.*, 2001). ISA 315 identifies three risk assessment procedures: making inquiries of management and others within the client's organization, performing analytical procedures, and making observations and inspection (IFAC, 2010c, p. 265). Risk assessment has been recommended as an integral audit procedure to increase the chances of fraud detection (Loebbecke, Eining & Willingham, 1989; Shibano, 1990; Knapp & Knapp, 2001). While the importance of risk assessment knowledge is nothing new in auditing, its importance may have been augmented by the frequency of accounting scandals. It continues to be an important SKA for auditors.

6. Internal controls knowledge: The Committee of Sponsoring Organizations of the Treadway Commission (COSO, 1992: 1) defines internal controls as 'a process, effected by an entity's board of directors, management, and other personnel, designed to provide reasonable assurance regarding the achievement of objective in the effectiveness and efficiency of operations, reliability of financial reporting, and compliance with applicable laws and regulations.' Under the Sarbanes-Oxley Act (SOX), external auditors are required to assess the effectiveness of, and to attest to the management's report on, the firm's internal controls over financial reporting. Internal controls and internal control systems are becoming increasingly important in audit, so much so that an 'internal control explosion' has been observed (Maijoor, 2000). Obviously, non-US companies that are listed or planning to list on US stock exchanges are bound by SOX. In addition, more and more US companies are expecting their foreign contractors and suppliers to follow the SOX guidelines. Many countries have either adopted or are planning to adopt similar provisions to SOX. In 2009, the Singapore Stock Exchange (SGX) issued new rules to strengthen the corporate governance of companies listed on its exchange, requiring greater accountability for internal controls (Ernst & Young, 2009). Since then, there have been several reports of SGX-listed companies being reprimanded for weaknesses in their internal controls (Lim, 2011; Tan, 2011). There is no doubt that internal control knowledge is critical not only for auditors in Singapore but around the world too. The more interesting question is how important it is as a SKA relative to other SKAs.

7. Forensic accounting knowledge: Forensic accounting involves investigating financial transactions and business situations to develop an expert opinion with regard to possible fraudulent activities. It is a field that integrates accounting and auditing knowledge and investigative skills. While external auditors' duty is limited to finding out material misstatements regardless of whether they arise from fraud or error, the duty of a forensic accountant is to purposely discover fraudulent misstatements. Forensic accounting is a distinct career – an emerging and popular career path within

the accounting profession. While currently it is not a mandatory requirement, having forensic accounting knowledge may give an auditor an added advantage. According to Iwata (2003), there have been signs of a growing demand for auditors trained in forensic accounting – the Big Four accounting firms have been hiring many corporate auditors who are trained to spot crimes involving fraud. Therefore, we like to find out whether forensic accounting knowledge is important to auditors in the new business environment that has been tainted by too many accounting scandals.

8. **Fraud detection skills:** Misstatements in financial statements can arise from either fraud or error; fraud is an intentional act whereas error is not. According to Coenen (2010), fraud is rarely detected by financial statement audits because it is not the primary objective of such audits. Fraud is often not detected during audits because ‘young auditors often do not know what questions to ask and are usually reluctant to challenge clients’ managements’ assertions’ (Coenen, 2010, p. 38). In addition, most auditors lack an in-depth understanding of fraud schemes and how they are carried out (Coenen, 2010). In November 2002, the US Auditing Standards Board (ASB) issued Statement on Auditing Standard (SAS) 99, *Consideration of Fraud in a Financial Statement Audit* (AICPA, 2002). The new standard aims to have the auditors’ consideration of fraud seamlessly blended into the audit process and continually updated until the completion of the audit. While SAS 99 imposes a significant burden on the auditor, suggesting that fraud detection skills may be important to auditors, this may only be true for US auditors. The international auditing standard, ISA 240, explicitly states that the responsibility for fraud detection rests with the management and those in charge of corporate governance of the business entity (IFAC, 2010b, p. 157). ISA 240 limits auditors’ responsibility in fraud detection to obtaining reasonable assurance that the financial statements are free from material misstatements. Therefore, in jurisdictions that follow international auditing standards, fraud detection skills may not be as important.

According to the inaugural KPMG Audit Committee Institute report, fraud is a pervasive and serious threat in Singapore – nearly one out of four companies in Singapore has experienced at least one fraud incident. Based on a survey of directors and senior executives of the top 1,000 organizations in Singapore, the proportion of respondents who have suffered from financial reporting frauds has grown from 9 percent to 24 percent during the survey period (KPMG-ACI, 2009). On the other hand, according to Transparency International’s 2010 Corruption Perceptions Index (CPI), Singapore is tied for the least corrupt country (with Denmark) with a score of 9.3 (10 is perceived to have a low level of corruption) (Transparency International, 2010). If financial reporting fraud is so common in the country perceived to be the least corrupt in the world, the situation might be worse in other countries. In summary, we feel that fraud detection skill is of growing importance as a SKA for auditors but this may vary in different jurisdiction or geographical locations.

9. **Decision-making skills:** Audit judgment is a widely researched area with the primary objective of how to improve auditors’ decision making. Even though most major decisions are made by audit seniors, managers, and partners, there are enough important decisions that all auditors must make individually or collectively. According to Nelson and Tan (2005), the audit task includes activities and decisions related to risk assessment, audit planning, evidence evaluation (sufficiency and appropriateness of audit evidence), auditors’ decisions regarding whether to require clients to book proposed adjusting journal entries, and going-concern judgments. These activities require decision making and judgment on the auditor’s part, which highlights the importance of decision-making skills to be effective as an auditor. Tan’s (1999) study includes ‘decisive’, referring to making ‘decisions quickly, clearly and emphatically’ (p. 82). We also include this SKA in our study.

10. **Project management skills:** The auditor in charge of an audit, who acts as project manager, needs good project management skills to plan, implement, manage, and complete audits. Project management skills are useful to keep planned audit scope and objectives on track (Sinason, 2002). According to Sinason, McEldowney and Pinello (2002), project management techniques such as program evaluation and review technique (PERT) and critical path management (CPM) can help auditors to effectively allocate staff and resources. Based on the literature, project management skills seem to be more useful later in the audit career. As we are interested in identifying SKAs that are critical for auditors (irrespective of the career stage), we include it in the study.

In total, we have selected 17 SKAs that we think are important for the success of an auditor.⁵

Research Question 2: Do the SKAs map into a set of competencies for auditors? How do the ELAs fare in each SKA and audit competency?

The objective of research question 2 is to develop a set of key competencies based on the list of SKAs identified in research question 1. In addition, we seek to determine the gaps in ELAs’ performance (as perceived by the supervisor) against the importance (as perceived by the supervisor) for each identified SKA and competency set.⁶ Identifying key competency sets, and how ELAs fare in each SKA and competency set is an important initial step in improving auditors’ capabilities and performance. This will help various audit constituencies (such as higher education institutions, accounting firms, professional bodies, and regulators) to be cognizant of the critical SKAs and competencies still lacking in accounting graduates upon completing their university training and education. We hope the awareness will lead to more concerted effort among the various stakeholders to continuously develop the important SKAs in auditors.

RESEARCH METHOD

Survey questionnaire

We used a survey questionnaire to gather data. The questionnaire consisted of three parts. In the first part, questions were designed to capture participants’

importance ranking for each SKA. A five-point Likert-type scale (1 = 'not at all important', 5 = 'very important') was used. In the second part, participants were asked to rate the ELAs' performance on each SKA, based on their impressions of the accounting graduates when they first joined the participants' firm. A five-point Likert-type scale (1 = 'very low', 'very low competency' or 'not at all knowledgeable', 5 = 'very high', 'very high competency' or 'very knowledgeable', respectively) was used here as well. The final part of the questionnaire gathered participants' demographic information.

The original questionnaire that we drafted included the 17 SKAs previously described. We then sought suggestions from an audit partner of a Big Four accounting firm in Singapore to refine the questionnaire. Based on the suggestions of the audit partner, financial accounting theory knowledge was separated into three items: fair value accounting knowledge, accounting standards knowledge, and double-entry accounting knowledge. Communications skill was separated into two items: oral communication skills and written communication skills. Therefore, Parts 1 and 2 of the survey questionnaire had 20 questions each. We also pre-tested the questionnaire with two accounting faculty members from a Singapore public university, both specializing in auditing research and curriculum. Their suggestions were incorporated in the final version of the questionnaire.⁷

Participants

Audit supervisors of local as well as multinational accounting firms located in Singapore were targeted as the survey population. A total of 440 questionnaires were distributed to the following three convenient samples: (1) Nanyang Technological University alumni who were working in an accounting firm, and had at least five years' accounting experience (via mailed survey); (2) public accountants who were attending continuing education workshops conducted by the Institute of Certified Public Accountants of Singapore (ICPAS) (via administered survey), and (3) auditors of a Big Four accounting firm who were attending an in-house staff training (via administered survey). A total of 177 responses were received, resulting in a response rate of 40 percent.^{8,9}

More than half of the participants (101) had more than six years of public accounting work experience; 45 percent had degrees in accounting while the rest had a professional qualification or a diploma;¹⁰ 47 percent of the respondents were over the age of 30; 62 percent were female; 67 percent of the respondents were educated in Singapore higher education institutions and 28 percent studied in overseas higher education institutions (five percent did not indicate where they were educated).

RESULTS AND DISCUSSION

Research question 1

The mean importance rating of each SKA as well as its importance ranking is shown in Table 1. The mean importance ratings for all SKAs are above the mid-point (with 17 SKAs having a mean rating above 4.0). The data suggest that the SKAs selected for this study, except for fraud detection skills, information systems knowledge, and forensic accounting knowledge, are perceived as highly important to be successful as an auditor.

Table 1: Participants' mean importance ratings of the skills, knowledge, and attitudes

Rank	Skills, knowledge, and attitudes	Mean
1	Professional integrity	4.89
2	Assessing audit evidence	4.68
3	Questioning mind	4.66
4	Ability to understand client's business	4.63
5	Knowledge on double-entry accounting	4.61
6	Knowledge on accounting standards	4.55
7	Critical thinking skills	4.54
8	Risk assessment knowledge	4.44
9	Oral communication skills	4.41
10	Written communication skills	4.33
11	Interpersonal skills	4.32
12	Internal control knowledge	4.28
13	Negotiation skills	4.23
14	General business knowledge	4.19
15	Project management skills	4.17
15	Knowledge on fair value accounting	4.17
17	Decision-making skills	4.14
18	Fraud detection skills	3.80
19	Information systems knowledge	3.78
20	Forensic accounting knowledge	3.46

According to the mean importance ratings, professional integrity is the most important SKA with a mean importance rating of 4.89. Interestingly, of the prior accounting competency studies, only Kavanagh and Drennan (2008) have identified ethics as a critical SKA. Surprisingly, in two worldwide surveys of audit topics from the audit professors' perspective (conducted in 2000 and 2005), professional ethics was ranked as the eighth most important topic in an auditing course in 2000 and the tenth most important in 2005 (Armitage, 2008). Neither professional integrity nor ethics has been identified as one of the top five auditing course topics in three other studies (Engle & Elam, 1985; Bryan & Smith, 1997; Johnson *et al.*, 2003). On the other hand, practitioners have ranked ethics as the second most important topic that should be included in an auditing course (Armitage & Poyzer, 2010). None of the extant audit expert attribute studies examined the importance of professional integrity or ethics.

The ability to assess audit evidence and having a questioning mind, both of which relate to professional skepticism, are the next most important SKAs. Five prior studies involving academics have identified assessing audit evidence as one of the top five auditing course topics (Engle & Elam, 1985; Bryan & Smith, 1997; Johnson *et al.*, 2003; Armitage, 2008; Armitage & Poyzer, 2010). However, practitioners in a 2008 audit topic survey did not select this as one of the top five audit topics (Armitage & Poyzer, 2010), even though the same 41 topics were rated by academics as well as practitioners. Having a questioning mind, on the other hand, has not appeared in any of the prior surveys as an important audit topic. It might be because developing a questioning mind is not an audit topic, rather a transferable skill. Neither professional skepticism nor a questioning mind has been examined in any extant audit expert attribute studies. Interestingly, both Abdolmohammadi and Shanteau (1992) and Abdolmohammadi *et al.* (2004) have included 'inquisitiveness' as a distracter term. Inquisitiveness, however, is identified as an important attribute by survey participants in the open questionnaires in both those studies. Tan (1999) has not included a questioning mind or inquisitiveness in his study.

In summary, the three SKAs that received the highest mean importance ratings in our study are not included in any of the prior studies on accounting competencies or audit expert attribute studies. Auditing topic studies have examined professional ethics and ability to assess audit evidence. However, perceptions of academics and practitioners are divided about the importance of these two SKAs.

Ability to understand client's business, which is ranked the fourth most important SKA in our survey, is not an auditing topic, and therefore not included in the auditing topic studies. Tan (1999) examines the importance of client knowledge (which is somewhat different from the ability to understand client's business) to auditors at different organizational levels. Out of the 20 attributes examined by Tan (1999), client knowledge is ranked as the 15th in importance for audit assistants, first for audit seniors, seventh for audit managers, and third for audit partners. Its average importance rank across all organizational levels is mediocre (ninth out of 20).

Double-entry accounting knowledge is ranked by our participants as the fifth most important SKA. Prior accounting competency studies have examined the importance of accounting knowledge, without decomposing it further. Audit expert attribute studies examine technical knowledge, without decomposing it further. Audit topic studies only consider auditing but not accounting topics. As a result, we cannot compare our findings with those of prior studies on double-entry accounting knowledge. Interestingly, the average importance rating of knowledge on fair value accounting is substantially lower than that of double-entry accounting knowledge and financial accounting standards knowledge. It is also important to note that double-entry accounting knowledge and financial accounting standards knowledge receive higher importance rankings than auditing specific knowledge areas such as risk assessment knowledge and internal control knowledge. Internal control knowledge is ranked (by academics as well as practitioners) as one of the top five topics in all previous auditing topic surveys. One possible explanation is that auditing topics surveys only consider audit-specific knowledge areas. As our survey includes broader skills, knowledge (both auditing and other knowledge), and attitudes, we may be highlighting other SKAs that are relatively more important than audit-specific knowledge to succeed as an auditor. Our study contributes to extant literature on auditing SKAs by examining a broader and potentially more complete set of SKAs in a single study.

Another important finding in our study is that although communication and interpersonal skills are ranked very highly in accounting competency studies, our study reveals that eight other SKAs rank higher than communication and interpersonal skills. According to the findings of Tan (1999), communication is the fourth most important attribute for audit assistants and audit managers, the fifth most important for audit seniors, and second most important for audit partners, suggesting that the importance of communication increases with audit rank. None of the prior studies that we mentioned earlier distinguishes between written and oral communication. We find that oral communication skill is perceived to be more important than written communication skill. Goby and Lewis (1999) report similar perceptions.

Research question 2

Research question 2 seeks to identify auditors' key competencies and examine audit supervisors' perceived performance of ELAs in the identified SKAs and key competencies. We perform an exploratory factor analysis on the participants' importance ratings of the 20 SKAs using Varimax rotation with Kaiser normalization. The SKAs load onto five distinct dimensions as shown in Table 2. Based on the nature of the SKAs that load into each dimension, the five dimensions appear to relate to (1) basic audit competency, (2) advanced audit competency, (3) managerial competency, (4) professionalism competency, and (5) business competency. For each competency, we compute a mean importance score based on the importance ratings for the SKAs that load into that competency. We also analyze the performance-importance gap, which is the difference between a supervisors' mean perceived performance and importance ratings, for each SKA and competency. A positive importance-performance gap indicates that the ELAs' performance falls below the required level and vice versa. The results of the importance-performance gap for the identified SKAs and competencies are reported in Table 2.

Table 2 shows that all competencies have a performance mean that is close to the mid-point value of 3, and all competency dimensions have positive mean differences – i.e., the performance of ELAs is below the superiors' perceived level of importance. Business competency has the largest importance-performance gap, followed by professionalism competency and managerial competency (mean differences of 1.53, 1.30, and 1.02, respectively). Note that within business competency, the SKA with the largest importance-performance gap is understanding client's business. The SKAs under each of the other competencies with the largest difference in importance and performance are knowledge of accounting standards (basic audit competency), knowledge of internal controls (advanced audit competency), project management skills (managerial competency), and assessing audit evidence skill (professionalism competency). The performance means of these SKAs are also close to the mid-point value of 3, suggesting that the ELAs have some competency but the level is inadequate. While this finding is encouraging, it is important that the ELAs continue to improve on the SKAs that are ranked as highly important. The results also indicate that assessing audit evidence, ability to understand client's business, and knowledge of internal control are critical knowledge and skill areas to succeed as an auditor. These results may indicate that tertiary education alone does not adequately equip accounting graduates with the necessary competency levels required by the auditing profession, particularly for some of the critical SKAs, given that the majority of the ELAs in Singapore would have had a tertiary education in accounting or business. Some of the SKAs and competencies such as the ability to understand a client's business are best developed via on-the-job training as each client's business is unique and an in-depth understanding will require time on the part of the auditors.

CONCLUSION

Our study seeks to contribute to the extant auditing literature by examining a broader and more comprehensive set of skills, knowledge, and attitudes that are essential to succeed as auditors. Our survey is confined

Table 2: SKAs and competencies: importance and performance means, and performance-importance means

SKAs	Factor loadings	Competency dimension	Importance mean	Performance mean	Importance-performance mean*
KI – Risk assessment	0.695	(1) Core audit	4.44	3.04	1.36
KI – Information systems	0.593	competency	3.78	2.55	1.23
SI – Decision making	0.565		4.14	2.97	1.17
KI – Accounting standards	0.521		4.55	3.09	1.46
SI – Critical thinking	0.453		4.54	3.18	1.36
KI – Double-entry accounting	0.400		4.61	3.19	1.42
			3.84	3.00	0.84
KI – Forensic accounting	0.846	(2) Advanced audit	3.46	2.35	1.11
SI – Fraud detection	0.585	competency	3.80	2.70	1.10
KI – Internal control	0.500		4.28	2.84	1.44
KI – Fair value accounting	0.400		4.17	2.81	1.36
			3.27	2.68	0.59
SI – Oral communication	0.697	(3) Managerial	4.41	3.43	0.98
SI – Interpersonal	0.616	competency	4.32	3.43	0.89
SI – Written communication	0.495		4.33	3.33	1.00
SI – Negotiation	0.464		4.23	3.18	1.05
SI – Project management	0.454		4.17	2.99	1.18
			4.29	3.27	1.02
SI – Assessing audit evidence	0.653	(4) Professionalism	4.68	3.22	1.46
AI – Professional integrity	0.487	competency	4.89	3.73	1.16
AI – Questioning mind	0.480		4.66	3.38	1.28
			4.74	3.44	1.30
KI – Client's business	0.823	(5) Business	4.63	2.79	1.84
KI – General business	0.443	competency	4.19	2.97	1.22
			4.41	2.88	1.53

* Mean of the differences in participants' importance and performance rating; all the differences are significant at $p < 0.001$.

to participants in Singapore. However, the study findings and implications may be generalizable as the accounting profession in Singapore closely adheres to international accounting and auditing standards as well as practices.

Our findings show that professional integrity is the most important SKA for auditors in the current audit environment. Its importance or the consequences of the lack of it have also become more salient as a result of numerous recent audit failures and public discussion of the issue by various regulators and professional bodies. However, in prior auditing research, academics have not identified professional integrity or ethics as a very important audit topic, but practitioners have (Armitage 2008; Armitage & Poyzer, 2010). There seems to be a disconnection in the perceptions of practitioners and academics when it comes to the importance of professional integrity and ethics to an auditor. Perhaps, in some universities, ethics is covered in a separate course from audit courses (Titard, Braun & Meyer, 2004). Another possibility is that instilling professional integrity and ethics is perceived as a responsibility of the professional bodies and firms. However, our findings suggest that professional integrity is too important not to be given sufficient emphasis in university curricula and training. In fact, in a UK-based survey conducted by Crawford *et al.* (2011), practitioners think that 15 out of the 16 generic skills examined should be taught in universities. Professional integrity and ethics are not examined in that survey. Nevertheless, their results reiterate that instilling knowledge should not be the only objective of a university education – development of necessary skills (and attitudes) in students is equally important. Johnson *et al.* (2003) recognize that developers of accounting curricula face the challenge of finding the

right balance among imparting knowledge, nurturing skills, and raising professional conscientiousness. Our study finds that some skills and attitudes received relatively higher importance ratings than knowledge. Therefore, developers of accounting curricula need to pay careful attention to the combination of SKAs to inculcate in their students. Several studies have examined the use and effectiveness of novel and active pedagogies (Cornick, Bhamornsiri & Malmgren, 2003; Watts & McNair, 2008; DeBerg & Chapman, 2012). Accounting curriculum developers can use the results of these studies and ours to explore pedagogies that can help to build up the critical SKAs in students.

Our findings also highlight the value of a holistic approach to accounting education. Some of the knowledge areas that are acquired in general business and accounting courses received higher importance ratings than knowledge acquired in auditing courses. For example, ability to understand client's business, double-entry knowledge, and financial accounting standards knowledge received higher importance ratings than risk assessment and internal control knowledge. These findings are significant because the *ability* to understand client's business and specific financial accounting knowledge areas have not been examined before. The high importance of the double-entry accounting is especially interesting because the relevance of double-entry accounting has been debated (Fisher, 1997). Hunton (2002) argues that many traditional accounting tasks can be reliably automated, which might then undermine the accountants' role and contribution. However, information systems perform accounting tasks in a mechanical manner and are not capable of exercising judgments that are increasingly needed in (new)

accounting standards. Therefore, accounting students need to be aware of the importance of having a thorough knowledge of double-entry accounting and financial accounting standards. Furthermore, Arens and Elder (2006) report that many accounting majors lack respect for 'soft material' covered in non-accounting courses. However, our results suggest otherwise and getting a holistic and broad accounting education is very important to succeed as public accountants.

Our findings have implications for future research. Our results support the importance and need of a broad rather than narrowly-focused accounting curriculum. Future research should include the perceptions of chairs of accounting departments and/or accounting curriculum committee, not just auditing professors. After all, the SKAs required to succeed are not acquired through auditing courses alone.

The findings on our second research question indicate that the 20 SKAs examined in our study can be categorized into five sets of auditor competencies: basic, advanced, managerial, professionalism, and business. Future research is needed to validate these competencies and their generalizability to other countries and hierarchical levels (e.g., audit seniors, managers, and partners). In the present, the findings may be particularly important for professional bodies and auditing firms. According to the International Education Standard 8 developed by the International Federation of Accountants (IFAC, 2006), the education and development required to become an audit professional can be obtained at different points along the education cycle. The standard indicates that education pursued at academic institutions, on-the-job training, employer or professional organization training, and continuing professional development are all vital to becoming an audit professional. In this context, our findings (especially the vital importance of skills and attitudes) can be used by professional bodies such as the Institute of Singapore Chartered Accountants (ISCA) and Certified Practising Accountants Australia (CPA Australia), which are the dominant professional accounting bodies in Singapore, to improve the quality of their members. For example, professional bodies could focus on helping ELAs develop their ability to understand clients' businesses through sharing by industry experts at seminars, training sessions, and conferences. Such training can provide significant leverage for ELAs in their initial years in the profession, and lift their competency levels.

Similarly, accounting firms and professional bodies can develop SKA training programs, prioritizing by their importance and assessed importance-performance gaps. In addition, Tan (1999) reports variations in the relative importance of audit attributes across organizational levels. Thus, accounting firms will need to combine their own assessments and findings from this study and Tan's (1999) study in developing and customizing their training programs for different audit ranks.

There are several limitations in our study. Performance ratings are subjective by nature and our study participants are all based in Singapore. Future research is required to test the generalizability of the findings of our study. Nevertheless, we believe our findings are not necessarily country-specific as 28 percent of the participants are educated overseas (i.e., outside of Singapore). It is also possible that the perceived performance of ELAs only reflects the quality of Singapore undergraduate accounting training and curriculum. However, the

accounting curriculum in Singapore universities closely resembles that in many developed countries. Being a cosmopolitan city, Singapore accounting firms also employ accounting graduates from other overseas universities. Consequently, our findings on ELAs' performance may not be country-specific, pertaining only to the effectiveness of Singapore accounting training and curriculum. Future research can look into these issues. Another avenue for future research is to examine changes in the relative importance of SKAs and competency sets across audit ranks. Extending the examination across hierarchical levels provides a potentially better understanding of the roles and contributions of on-the-job training, continuous professional education, and even postgraduate qualifications.

Another limitation of our study is that the participants do not have the option to indicate other attributes that they think are important to succeed as an auditor. While we have conducted an extensive literature review, the SKAs examined in our study may not necessarily be exhaustive. In addition, we have not defined the SKAs in our survey instrument. Consequently, our participants could have different notions of the identified SKAs. Future research can include more detailed explanations and context of the SKAs examined in this study, and other relevant SKAs. For example, internal control knowledge can be examined in greater detail. New governance requirements have placed more emphasis on documenting and testing internal controls over financial reporting and required other good corporate governance controls and practices to be adopted (Arens & Elder, 2006). Equally important, future studies should include internal control skills, not merely knowledge. Skills of linking internal control strengths and weaknesses to both financial statement assertions and (the nature and extent of) substantive testing are especially worthy of investigation.

There are also research opportunities on SKAs that have received relatively low importance ratings in the study. Forensic accounting knowledge received the lowest importance rating. In the US, the Sarbanes-Oxley Act has led to a widespread belief that auditors would need enhanced forensic accounting skills (Arens & Elder, 2006; Smith & Crumbley, 2009). However, there is no recent audit competency study of the US setting, and further study is needed to conclude whether the low importance rating in our study is country-specific or the need for greater forensic accounting knowledge is overstated.

Finally, as the accounting profession and practice continue to evolve and new standards and regulations become effective, there is a need to continuously evaluate the SKAs needed by the profession – this is a dynamic research area, so more frequent studies are needed. Johnson *et al.* (2003) highlight the importance of auditing faculty actively working with professional organizations to pursue research that addresses the problems facing the profession, and maintaining dialogues with leaders and regulators of the profession. Clearly, there is much that still needs to be done. Through more research, greater commitment and collaboration among academics, practitioners, and professional bodies and regulators, accounting scandals and audit failures may become a thing of the past – a goal that is worth working for.

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NOTES

1. ELAs are fresh accounting graduates who have just started working as an auditor in a public accounting firm. In the survey instrument, participants are asked to rate the performance of ELAs based on the opinions that they form about the ELAs when the ELAs first join their audit firm.
2. With effect from July 1, 2013, in order to qualify as a Chartered Accountant of Singapore, accountants need to pass a professional entrance exam known as Singapore Qualification Program (<http://Singaporeqp.com/>).
3. In his study, Tan (1999) includes attributes like adaptable, decisive, drive, which fall under the category of attitudes, capabilities, and professionalism.
4. The term critical thinking skills is used instead of problem-solving skills; financial accounting theory knowledge is used instead of accounting knowledge; and information technology is used instead of information systems.
5. Professional skepticism is separated into two: a questioning mind and an ability to assess audit evidence.
6. The term 'audit supervisors' will be used to include audit seniors, audit managers, and audit partners who have supervised ELAs.
7. The final questionnaire is available from the first author upon request.
8. One response was deleted because more than 15 percent of the required data was missing in the completed questionnaire.
9. Analyses, not reported in the paper, showed that there was no significant difference in the mean score for each SKA across the three samples, except for forensic accounting and fraud detection, where the means of the two administered samples were higher than the mailed sample (for forensic accounting, 3.69 vs. 3.06 ($p = 0.001$) and 3.57 vs. 3.06 ($p < 0.001$); and for fraud detection, 3.95 vs. 3.44 ($p = 0.005$) and 3.93 vs. 3.44 ($p < 0.001$), respectively). There was no significant difference between the means of the two administered samples ($p = 0.11$). As the findings are substantially the same across the three samples for all but two SKAs noted previously, we combined the data of the three samples in all our subsequent analyses.
10. In Singapore, the educational requirement to become a public auditor can be fulfilled through an undergraduate degree in accounting, a diploma in accounting, or by completing the examinations of professional accounting bodies.

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