

ICT SKILLS DEVELOPMENT: EDUCATION¹

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Technological changes across the financial reporting supply chain impact the information and communications (ICT) skills needed by professional accountants to perform their roles. This article identifies significant questions for accounting faculty arising from technological advancements. For example: What ICT skills need to be taught in accounting at college/university to keep up to date with the needs of the profession? How, and in what courses, should ICT skills be taught? Should ICT skills be embedded in the curriculum throughout the degree or should there be specialized standalone courses with an ICT focus? The article focuses on recent literature from both a practitioner and academic perspective to gain some insight into such questions and provides a snapshot of what is happening in some colleges/universities and continuing professional development activities in the area.

Implementing Required Skills in the Classroom

A 2017 PwC report describing IT workforce trends states that there is a chronic shortage of job candidates with data science and analytics skills, and this will likely expand in the future. Of employers surveyed, 59% stated that data science and analytics skills will be required by all managers by 2020. However, only 23% of university leaders report that their graduates will have these skills. The PwC report recommends all accounting programs include foundational knowledge of data analytics and the data science process.

This growing demand for professional accountants to have advanced IT knowledge and skills is acknowledged by the Association to Advance Collegiate Schools of Business (AACSB). Accounting programs the AACSB has accredited are required to follow the 2016 AACSB *International Accounting Accreditation Standard A7: Information Technology Skills and Knowledge for Accounting Graduates*.² AACSB A7 states that “consistent with the mission, accounting degree programs integrate current and emerging accounting and business statistical techniques, data management, data analytics, and information technologies in the curricula.” Inclusion of expanded ICT requirements in A7 was motivated

1 This article is an edited extract from the [International Accounting Education Standards Board's literature review on ICT skills development](#). The full literature review covers the digital age and opportunities for accountants, issues for the accounting profession, education and ICT development, and developing countries and ICT skills. The literature review is part of the IAESB's examination of megatrends to help inform the direction of accounting education in the digital era consultation process (see IAESB strategy and work plan for additional details).

2 In late 2017, the AACSB Accounting Accreditation Taskforce issued an exposure draft of revised Accounting Accreditation Standards and Processes, which proposes that A7 be replaced with A5, Information Technology Skills, Agility and Knowledge for Accounting Graduates and Faculty. This was adopted by the AACSB Accounting Accreditation Council in 2018 with the transition period for adoption being January 2019 and June 2020.

by the growth in data analytics and IT expectations for accounting graduates. The AACSB believes that the dynamic nature of IT developments is critical in developing today's accountants.

Additionally, *The Pathways Commission—Charting a National Strategy for the Next Generation of Accountants* (AAA 2012) states that “in today's global context, academic accounting programs need to quickly develop incentives, partnerships, and processes that identify and integrate current and emerging accounting and business information technologies throughout their academic curricula. The significant gap between academic instruction and professional practice places the profession at tremendous risk of not being able to fulfill our value proposition.”

AACSB A7 states that data creation, data sharing, data analytics, data mining, data reporting, and storage within and across organizations are all important skills (AACSB 2016). PwC (2015) highlights the same skill areas but recommends research skills and programming languages, such as R, SAS, and SQL. PwC also states that statistics and programming should be taught at all stages in an accounting degree program with additional, more advanced courses taught at the master's degree level. The AACSB (2016) recommends an interdisciplinary approach for IT skills development beyond stand-alone accounting information system (AIS) courses.

Sledgianowski, Gomaa, and Tan (2017) provide examples of how big data and information systems could be integrated into accounting courses, including introductory accounting, financial accounting, management accounting, cost accounting, intermediate financial accounting, auditing, AIS, and taxation. These courses could develop technological competencies, such as ratio analysis using data from databases like EDGAR, analyzing tagged information from XBRL reporting, conducting what-if analysis with structured/unstructured data, implementing commercial audit software to detect fraud, design and structure of transactional databases, programming languages, and using Big Data to assist in analyzing tax information.

University Approaches

The models for teaching ICT skills at universities vary. Some universities teach ICT courses within their accounting department, some rely on information system departments, and others have now merged accounting and information systems into one department. Some universities teach the skills throughout a degree program while others have dedicated core courses and/or elected courses in a program.

For example, an introductory core course may provide an ICT introduction within a business context. Students would then apply this knowledge to a specific context where they organize, analyze, and report data using MS Excel and MS Access. A following core course would apply these basic skills to accounting systems implementation within specific contexts using accounting software, such as MYOB QuickBooks or Xero. An elective course would take a more applied approach and require students to analyze and evaluate accounting requirements, critique accounting systems implementation, and design and document new accounting systems using small business software. In addition, students would consider current issues such as XBRL, Big Data, and data analytics. Another approach is to teach ICT skills in dedicated AIS course. For example, subjects could include data analytics and information

management, advanced data analytics, information analysis and system design, business process management, managing business data, or information systems strategy.

Janvrin and Weidenmier Watson (2017) argue that while Big Data and accounting has diverse and widespread consequences, the primary goal for accounting has not changed—the need to create and provide information to internal and external decision makers. This should not be forgotten in accounting course design when teaching ICT skills. McKinney, Yoos, and Snead (2017) acknowledge the need for accountants skilled in working with Big Data but also highlight the need to identify the cognitive skills required to conduct effective Big Data analysis. They argue that accounting students need to be trained as informed skeptics and able to understand the limits of “measurement and representation, the subjectiveness of insight, the challenges of statistics and integrating data sets, and the effects of under-determination and inductive reasoning.”

Continuing Professional Development

Due to increasing technological advancement in the business world, which is reflected in a number of accounting functions, it is not difficult to understand why there is growing demand for advanced IT knowledge and skills for professional accounting (Pan and Seow 2016). Recently, both industry and the accounting profession have acknowledged these advances and introduced new programs for accountants to complete as part of their continuing professional development (CPD). For example, the American Accounting Association (AAA) has a Strategic and Emerging Technologies section that features an emerging technologies workshop at their annual conference. The section aims to “promote the global creation and communication of knowledge about [strategic and emerging technologies] in accounting, auditing, and taxation” (AAA 2017). Additionally, the AAA runs an annual Accounting Information Systems Big Data Conference that qualifies as CPD for practitioners and educators and includes topics such as advanced tax analytics, blockchain transformative innovations, cybersecurity, and AI and cognitive technologies. Many professional accounting organizations, such as the American Institute of CPAs, CPA Australia, Chartered Accountants Australia and New Zealand, Chartered Institute of Management Accountants, and Institute of Chartered Accountants in England and Wales, now feature regular webcasts, self-study guides, and live educational events on ICT skills development for CPD credits.

The Public Interest Oversight Board (PIOB) is also interested in IT advances. In June 2017, the PIOB organized the Impact of Technology on Audit Forum with presentations on recent relevant research and perspectives from a provider of technological services for auditors (PIOB 2017). The AICPA also runs an annual digital conference that features cloud-based technologies and the need to gain expertise in new technologies, legislation, and client adoption. Similar conferences exist in other countries, such as the Accounting and Business Expo and Accountants’ Technology Showcase in Australia run by National Media. Such conferences and events feature updates on how technology is changing the profession and include tools and tips to survive the global technological trends.

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