Aligning the Technical and Soft Skills
of Management Information Systems and Business
Analytics Curricula to Supplement Accounting
Education

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Abstract

Familiarity with management information systems (MIS) and business analytics (BA) knowledge as well as soft skills facilitating teamwork are becoming critical for business-related disciplines. This study explores the need for information systems (IS) and analytics courses and soft skills in accounting positions by analyzing accounting job listings in a geographic job market as well as those from national accounting firms. Using content analysis, we found a critical need for IS and analytical knowledge. Nearly half of all entry-level positions indicated applicants were expected to have knowledge on concepts taught in a systems analysis and design course (SA&D). Additionally, 89% listed analytics skills while 19% required database knowledge. These findings suggest IS and analytics expand the marketability of accounting students. Further, this research revealed a wide range of soft skills that entry-level accountants were expected to demonstrate, including presentation skills and teamwork which would be improved through classes consisting of students from diverse majors. The findings indicate the need for IS programs to offer transdisciplinary IS and analytics courses that can provide business students with opportunities to develop practical skills, an asset in a team-driven workplace.

Keywords: Curricula, Information Systems, Business Analytics, Accounting

1. INTRODUCTION

A best practice for management information systems (MIS) programs to encourage enrollment is to add data analytics programs and cross-sell courses to other departments (Koch, Slyke, Watson, Wells, & Wilson, 2010). Expanding on this idea, we evaluate how MIS courses can meet the accounting professional's educational needs. Due to the advancement of new areas in information technology (IT) and data analytics, the need for analytical skills has risen, and expectations for business school graduates increasingly include the ability to, within a team

structure, analyze systems and provide suggestions for improvements. Thus, information systems (IS) departments should provide additional opportunities to develop advanced IS and analytical skills for accounting students.

MIS capture, store, process, and communicate data, information, and knowledge. Similarly, Guragai, Hunt, Neri, and Taylor (2017) observed that organizations use accounting information systems (AIS) to help control and allocate their resources to enable and limit those who engage in transactions. According to Jafar, Babb, and Abdullat (2017), the field of data analytics has tremendous potential to improve an organization's use of IS.

The IS field is facing many challenges driven by an increase in globalization, cloud computing, the integration of enterprise resource planning (ERP), ubiquitous mobile computing, and the modernization of IT frameworks (Topi, Valacich., Wright, Kaiser, Nunamaker, Sipior, & Vreede, 2010). Despite the importance and the demand for MIS professionals, enrollment has declined. To redesign their curricula, some programs look to match their MIS curriculum to the hiring requirements of MIS graduates (Burns, Gao, Sherman, & Klein, 2018). But, given that MIS supports the entire organization, MIS departments should also explore the learning needs of other business students, complementing the course offerings of other departments, such as accounting.

The American Institute of Certified Public Accountants (AICPA), and other leading professional accounting societies, recommend the alignment of accounting and IS. Some universities have added AIS or IS related concentrations, tracks, certifications, or majors, offering students an opportunity to blend the most critical accounting concepts with essential IS concepts (AIS; Dillon, & Kruck, 2008; Chayeb and Best, 2005). The demand for such programs is supported by the AICPA offering certifications in IS and data analytics. If the demands of the accounting profession and other departments require more IS and analytical knowledge, universities should respond. Currently, some programs may only offer an AIS course (Neely, Forsgren, Premuroso, Vician, & White, 2015). MIS bridges technology to other functional areas, a task complicated by rising dependence on connectivity and algorithms. For MIS departments to survive, they must not only provide technically astute MIS students but also raise the importance of understanding of MIS to other business disciplines. By also serving other

departments they will be able to create diverse teams that will aid in developing soft skills among all graduates.

Universities and students, however, have limited resources that restrict the number of courses offered or that a student may take. It is, therefore, necessary to identify key concepts that relate. To address this need, this study aimed at examining accounting employer demand for specific aspects of the MIS curriculum, specifically database, enterprise systems, and SA&D (Topi et al., 2010). We content-analyzed job listings to determine whether accountants need these core subjects. Additionally, we examine the listings to determine the demand for analytics. Finally, as education professionals, we wanted to determine the essential soft skills that we need to develop in students, as we teach core MIS concepts. Our general research question is: Do recent accounting job listings contain knowledge, skills, and abilities covered by existing MIS and Business Analytics (BA) courses? The following specific research questions guided the analysis:

1. What MIS courses best benefit the career needs of accountants?
2. What BA courses best benefit the career needs of accountants?
3. What soft skills should be emphasized in MIS and BA coursework to benefit accountants?

2. LITERATURE REVIEW

The section will first review literature on existing AIS, then MIS curriculum guidelines, and key MIS and BA subject areas, and finally soft skills.

Accounting Information Systems (AIS)
We have adopted Romney and Steinbart's (2018) definition of AIS: systems that identify, collect, store, manage, and communicate accounting data and information for reporting and control. In AIS, reporting generates information comprised of both financial (e.g., statement of cash flows, income statement) and nonfinancial information (e.g., employee addresses). AIS emphasizes the use of systems to control and allocate resources, helping to enable and limit those who engage in certain transactions, making accountants play the role of gatekeeper and requiring them to know the system (Guragai et al., 2017). Despite the evidence of the importance of AIS and changes in technology most accounting programs may only offer a single AIS course or may not have the requirement at all (Larkin, 2020, Kearns, 2014). Further AIS courses have not substantially changed their content over the past decade (Larkin, 2020), suggesting an opportunity for MIS

programs to provide courses as valuable electives for accounting students and gain knowledge on emerging information technologies. We examined the current MIS curriculum guidelines to determine the best courses to supplement MIS knowledge for accounting students.

MIS Curriculum Guidelines

The most recent MIS guidelines by the Association of IS were published in 2010 and they have been used to both evaluate course requirements by MIS departments (Bohler et al., 2020, and to evaluate skill requirements (Burns et al, 2018). Topi, et al. (2010) suggest core MIS courses include Foundations of IS, Data and Information Architecture (Database), Systems Analysis and Design (SA&D), IS Project Management, IT Infrastructure, Enterprise Architecture (ERP systems), and IS Strategic Management. MIS professionals use IS to achieve organizational goals, and MIS faculty strive to create programs providing a balance of education and experience (Computing Curricula 2005; The Overview Report, 2006). Meanwhile, an AIS's effectiveness relies on the design of the system controls and the organization's training, implying that knowledge of how data are stored, and the design of the controls related to the system are essential to AIS (Shagari, 2017).

The AICPA (2019) notes that organizations are becoming more data-driven. The AICPA provides credentials to bridge the gap between IS and accounting, such as the Certified IT Professional (CITP). The CITP allows certified public accountants (CPAs) a path to opportunities bridging business and technology. The CITP provides additional certification in IT assurance, risk, security and privacy, analytics, and technology. The AICPA also sees data analysis skills as increasingly necessary, making the data analyst critical to an organization. Data analysts help leaders make informed, data-driven decisions to drive the company forward, improve efficiency, increase profits, and achieve organizational goals. To meet industry demand, the AICPA (2019) developed the Data Analyst Certificate, a comprehensive five-part certificate program providing training and practical guidance on data analytics. The preceding observations led us to focus this research on database, Enterprise Architecture, and SA&D as the MIS topics. IS Security was considered but is not a widely required course (Bohler et al., 2020) and may contain overlap with listed courses. The primary tenets of these MIS subject areas are reviewed in next three sections.

Data and Information Architecture (DIA) For this research, we adopted Stephens' (2008) definition of databases as tools that store data and let you create, read, update, and delete data. A DIA course covers database topics including database approach, types of database management systems, basic file processing concepts, conceptual and logical data models, database languages, data security and quality management, and business intelligence (BI) (Topi et al., 2010). Research suggests a gap exists between current database offerings and employers' needs (Yu & Chary, 2013).

Enterprise Architecture (EA)

An extension of DIA, EA can be described as the merging of several databases to serve the organization. ERP systems are software suites built to collect and organize data from various levels of an organization. They help businesses run critical processes, such as manufacturing, supply chain, sales, finance, human resources, and others (Almajail, Masa'deh, & Tarhini, 2016), and are among the best information technologies available to organizations to synergize internal resources and support critical business functions. ERPs have become integrated, with core infrastructure applications based on large-scale enterprise systems, moving the focus from system development to configuration and implementation. ERP includes topics like supply chain management and customer relationship management (Topi et al., 2010). Since ERP embrace every business aspect, an unsuccessful ERP launch may cripple an organization's ability to serve customers and cause financial difficulties (Saade & Nijher, 2016; Frejiik & Powell, 2015). According to Mekadmi and Louati (2019), the implementation of ERPs has blurred the lines of responsibilities for accounting and IS. Employers recognize the need for properly designed IS and input from all stakeholders (Dillon and Kruck, 2008). The importance of ERPs requires that accountants understand ERP, database concepts (Wilder et al., 2004).

Systems Analysis and Design (SA&D)

According to Harris, Lang, Oates, and Siau (2006), SA&D is an approach to the development of IS encompassing the first four phases of the systems development life cycle (SDLC)–Planning, Analysis, Design, and Implementation–connecting business problems to the design of IS solutions. SA&D education helps developers avoid designing IS that are ineffective, inefficient, or resulting in user dissatisfaction. Possible causes for poor system performance include misalignment of controls, the control environment, mechanisms, execution of control,

and socio-emotional behaviors (Cram, Brohman, Chan, & Gallupe, 2016). Poor system performance strains the IT department's relationship with other departments as they move to achieve different organizational initiatives such as BI (Etnyre, & Lehmann, 2015). The role for IS professionals in terms of control design is to design and implement IT solutions that enhance organizational performance. In contrast, for accountants, their role in control design is to add value in the process by providing financial expertise, participating as team players, and taking decision-making roles while integrating operational and strategic controls (Mahony & Doran, 2008). According to Association of IS 2010, students should "possess skills in modeling processes and data, defining and implementing technical and process solutions, managing projects, and integrating systems" (Topi et al., 2010, p. 8). Furthermore, modern SA&D is increasingly using agile methodologies such as Scrum where IT is directly working with end users and forming teams that completes projects using multiple iterations.

Business Analytics (BA)
BA is the process of providing meaningful insights from data. BA is in demand in the IS industry, but also in accounting (CGMA, 2016). The rise of big data has created increasing needs for new data and models. According to Bichler and Heinzl (2016), BA includes BI, data exploration, data transformation, data preparation, storage and retrieval, predictions (forecasting), presentation of explanations, and related topics. While an organization may have dedicated personnel working on corporate data analysis projects, they may not have the capacity to work on department level information projects. The Standard Occupational Classification System (United States, 2017), the Bureau of Labor Statistics (BoLS) states that Data Scientists:

> Develop and implement a set of techniques or analytics applications to transform raw data into meaningful information using data-oriented programming languages and visualization software. Apply data mining, data modeling, natural language processing, and machine learning to extract and analyze information from large structured and unstructured datasets. Visualize, interpret, and report data findings. May create dynamic data reports. (p. 22)

The SOCS goes on to provide example occupations to include BI Developer, Data Analytics Specialist, Data Mining Analyst, and Data Visualization Developer. One of the suppositions of this article is that accountants and auditors, defined by the SOCS as someone who examines, analyzes, and interprets accounting records to prepare financial statements, gives advice, or audits and evaluates statements prepared by others (United States, 2017, p. 14), are now doing some of the work usually associated with data analysts in their daily jobs. Thus, the need for analysis, and analytical modeling, and decision support skills has prompted many MIS programs to include analytics courses in their curricula.

Financial applications in the accounting industry do an excellent job of processing data into information for accountants. However, these programs may not provide methods to conduct ad hoc analysis and reporting. As a result, CPAs must become adept in using Microsoft Excel and other analytical software as technology evolves to handle today's changing needs for information (Blackwood, 2014). Accounting departments have identified this need and are beginning to integrate data analytics into introductory accounting courses using Excel, Power BI, and Tableau (Tietz, Miller-Nobles, & Cainas, 2019). However, initial exposure to analytics using these tools may be insufficient as new systems apply various statistical models and artificial intelligence algorithms to large datasets to continuously detect potential issues (Flynn & Stevenson, 2018). Big data analytics have resulted in substantial competitive gains across all industries (Mikalef, Pappas, Krogstie, & Giannakos, 2018).

Soft Skills
"It is people, not technology, who make sense of data and give it meaning. This means that business intelligence resides not in the data warehouse but in the minds of people" (CGMA, 2016, p. 3). A report from the Chartered Global Management Accountants (CGMA) points out that competence in technology is not enough to add value; a professional also needs to possess excellent decision-making skills and other soft skills. Schools also need to align their pedagogy to match required soft skills (Beard et al, 2008). The softs skill requirements widely vary in terminology and focus however in prior research connecting accounting and MIS planning, communication, leadership, teambuilding and communication has been a focus (Beard et al., 2008). Accounting curriculums specifically have focused on communication, problem solving, leadership and teamwork, ethical and moral values, and self-management (Villiers, 2010). Softs skills were also evaluated by using word

counts from job descriptions identifying problem solving, teamwork, analytical skills, time management, and self-motivation as the most common soft skills needed for MIS (Burns et al., 2018).

Timeliness

Organizations often need to have tasks performed within a strict schedule. The accounting profession mandates regular reports. However, this practice is not consistent with modern pedagogy that would have instructors provide more flexible deadlines with millennial students (Wilson & Gerber, 2008). While flexible deadlines are now expected in education, poor performance is penalized in the workplace (Rashly, Pit, & Ting, 2016).

Presentation

Villiers (2010) lists presentation skills as negotiation skills, active listening skills, questioning techniques, persuasion, conflict resolution, understanding different perceptions, handling objections, giving and receiving feedback, rapport building, written communication, and report writing, implying that accountants need effective oral and written communication skills. Accountants work closely with colleagues in a variety of different organizational roles, and invariably, their job performance is partially dependent on their ability to communicate (Kavanagh & Drennan, 2008). Capabilities should include listening, observing, interviewing, and analyzing archival materials, writing memos, reports, and documentation, using virtual collaboration tools, and giving effective presentations (Topi, et al., 2010). Pedagogy has adapted to address this need as flipped classrooms have been used in accounting and to strengthen soft skills such as communicating ideas through student-lead presentations and teamwork (Cord, 2018; Lubbe, 2016).

Teamwork

As with presentation skills, accountants must exhibit strong team skills (Kavanagh & Drennan, 2008). Professionals should collaborate effectively with other professionals as well as perform successfully at the individual level (Topi, et al., 2010). A core concept of flipped classroom pedagogy has been to allow students to self-learn within groups so that they may learn from each other and develop required soft skills (Cord, 2018).

Accountability

Accounting program graduates will be required to act in various collaborative roles during their professional careers, and most of them will likely be assuming leadership positions at various levels (Kavanagh & Drennan, 2008), often in a global context. Programs must prepare their graduates to be active collaborators and inspiring leaders. Capabilities should include leading cross-functional global teams, managing globally distributed projects, and structuring organizations effectively. Utilizing systems development techniques in classes such as SA&D would allow students to act in leadership roles such as Scrum masters within a flipped classroom and would allow them to develop leadership, accounting, and soft skills (Rush & Connolly, 2020; Hall, 2018).

Critical Thinking

This research uses Villers (2010) definition of critical thinking: creativity, analytical skills, framing issues, asking questions, probing, and awareness of ambiguities and complexities. Strong analytical and critical thinking skills are a foundation for everything that accountants do; they must be able to systematically analyze complex systems and situations, break them down into manageable components, understand deep connections within systems, and create solutions based on the results from a systematic analysis. Problem-solving is also omnipresent in the life of accountants. Capabilities should include analyzing the ethical and legal implications of complex situations, analyzing the risks associated with complex systems, solving complex problems, using quantitative analysis techniques appropriately and effectively, and enhancing innovation and creativity in oneself and others. Teaching how designers think is one way to foster critical thinking (Glen, Suciu, & Baughn, 2014).

3. RESEARCH METHODOLOGY AND DATA COLLECTION

To determine if the previously discussed technical topics and soft skills were evident in recent accounting job listings, this research used a simplified content analysis approach to evaluate the content of texts (White & Marsh, 2006). Content analysis requires an iterative process of unitizing, sampling, recording, and reducing the text until the desired level of quality is attained (Krippendorf, 2004).

For this research, the process consisted of defining the scope of job listings relevant to this study, collecting them for review, and creating an instrument to reduce the listings to meaningful data. After several iterations, the target job listing scope was defined as local (within 100 miles of the university), full-time positions, requiring an

accounting degree, and pursuing CPA certification. The initial data collection occurred in July of 2019, with 158 job listings of local accounting firms gathered from Indeed.com, and in August of 2019, an additional 45 job listings were gathered from national accounting firms consisting of the "Big four" (Deloitte, KPMG, PricewaterhouseCoopers, and Ernst & Young). After discarding irrelevant job listings and duplicates, a total of 86 job listings remained.

Job listings were indexed and reviewed and coded by two of the three researchers, arbitrated by the third to deconflict any issues. A small subset of the job listings was first examined to pilot a coding instrument to facilitate the coding process. The instrument was refined after coding the first subset of job listings to ensure inter-coder consistency in understanding the codes, keywords applied, and experience. Table 1 lists the finalized coding instrument, which includes 11 codes.

Six of the codes relate to MIS and BA areas. The code, *Database*, refers to whether the job posting included an expectation of applicants' database knowledge. *Report Writing/Generation* addresses a requirement for making reports of any kind (including both ones directly generated by IS and ad-hoc reports written based on information or data generated by IS), including financial statements. While this also implies excellent written communication, a soft skill, this was recorded as a technical skill. *Enterprise Architecture* was coded when the position involved the use of ERP or required experience in using a system classified as such. *SA&D* was applied when the job entailed design, testing, control, and/or analysis of the system. *Data Analytics* addresses whether the job posting mentions any need to analyze data. The jobs were also coded for the use of Excel.

Five codes were applied to classify soft skills mentioned in the posting. They included *Timeliness* for completing work promptly; *Teamwork* for working well with others; *Presentation* for requirements for formal communication, including presenting a report in front of others; *Accountability* leading or handling tasks with no supervision; and *Critical Thinking* for the ability to process and understand complex information.

In addition to the codes, the job postings were also classified for the *experience level required* (Entry, Some, Very) and *firm type* (National or Local). The results are discussed in the next section.

4. RESULTS

The final sample consisted of 44 postings from the national accounting firms and 42 from local firms. Thirty-seven postings were for entry-level positions, while 31 and 18 postings targeted applicants with some and extensive experience, respectively.

Table 2 reports the content analysis results organized in MIS, BA, and soft skills to allow contextual evaluation of the results. Their contingent frequencies by firm type (local, national), and if stated, the years of experience required in the job listing are also reported to delve into relative rates of occurrence of the codes in the job listings.

MIS
IS knowledge and skills in demand in the job postings include report writing/generation (80%), SA&D (38%), enterprise systems (14%), and knowledge in database (13%), in this order of frequencies.

Database knowledge was the least frequently mentioned MIS knowledge area. However, systems analysis and enterprise systems require knowledge of database concepts. Report writing or generation is another area that may be aided by general database knowledge. Ad hoc analytical reports are often based upon queries written on a database, and knowledge of database management systems (DBMS) would aid in independently generating these reports. Knowledge of database was more commonly required in entry-level positions.

Knowledge related directly to enterprise systems was required by nearly 14% of all job listings but was less frequently in entry-level positions (11%). Interestingly, enterprise systems knowledge requirements were more prevalent in local firms, with nearly 24% listing a specific or generic enterprise system knowledge as a requirement, than in large national firms (5%). Perhaps local or managerial accountants are more frequently required to participate in the operation of a specific system while national firms are auditing or consulting for multiple organizations.

SA&D was the most common MIS subject required, as 38% of the job listings discussed the need to evaluate and improve existing systems. The national firms required job seekers to analyze, and design solutions/improvements in controls or process in more than 50% of all their job listings. Furthermore, nearly 49% of all entry-level positions were required to have skills related

to SA&D, suggesting that as accounting students enter the workforce, they need to have the tools to analyze their organizations' IS and suggest improvements. While knowledge of database was listed, other technical aspects of SA&D, such as programming or networking skills, were not frequently required, indicating that the courses designed to teach SA&D should heavily emphasize the design of the controls, modeling processes, and testing.

In this sample, most (80%) of the positions listed report writing or generation as part of the job's requirements. Of note, report writing was listed in nearly 84% of all entry-level positions, indicating that students should have that skill as they enter the workforce.

The findings are consistent with previous research indicating that MIS skills are needed and that students would better align with employer demand with additional training in skills such as database (Kavanagh & Drennan, 2008). The findings are also supported by the AICPA, which offers additional certifications related to IS.

Business Analytics
Accounting requires analytical skills, with over 87% of the job listings requiring general data analytics skills (Table 2). National firms (83%) and entry-level positions (89%) exhibited a strong demand for general analytical ability, with the need for forecasting as the most specific analytic skill mentioned. Excel was mentioned by only one out of four positions, which is surprising given that components of the CPA exam are conducted in Excel.

While specific skills were not mentioned, certifications offered by the AICPA in analytics suggest that these skills are quickly going beyond the analysis traditionally performed in the accounting function. Our literature review also suggested the need for analytical skills, including Excel (Kavanagh and Drennan, 2008).

Soft Skills
Technical skills are in demand, but according to this sample, they need to be accompanied by soft skills, given that each soft skill coded appeared in a majority of the job listings (Table 2). The ability to meet deadlines, work in teams, present results, be accountable, and critical thinking are all essential.

While the creation of PowerPoints and written communication are teachable skills, other soft skills are challenging to impart in dedicated classwork. Our findings reveal that it is essential to offer students opportunities to practice these soft skills. Modern organizations expect graduates to have the ability to teach or explain to others the specifics of processes and present them to various stakeholders while working in a team framework. These results underline the importance of group work in the classroom to provide students an opportunity to practice leading and managing cross-functional teams and complete tasks within a specific schedule. Providing real-world project management experience would be ideal as it would allow students to interact in diverse groups while forcing them to use technical knowledge and critical thinking.

Based on these findings, Table 3 summarizes the answers to the specific questions posed by this research. The findings suggest that recent accounting job listings do include skills that are taught in MIS or BA courses. While there was weak evidence for MIS overall, entry-level job listings had a higher percentage, indicating that this requirement is newer to the profession.

5. LIMITATIONS

About half of the sample were job postings from national accounting firms, and the other half were postings from local firms in a single region in the United States. Therefore, the ability to generalize is limited. The sample also represents a snapshot of time, and the local firm postings were selected through only one job search site. Ideally, the researchers would have liked to include additional listings gathered from a variety of sources such as college recruiters.

6. CONCLUSIONS

We found that IS knowledge, analytics ability, and soft skills are widely required even for entry-level accounting positions, suggesting that it is essential to expand the opportunities for accounting students to gain knowledge and experience in these areas. The technical skills required by accountants are being reflected in the increased certification offerings by the AICPA. Accountants in entry-level positions are increasingly being asked to have more technical knowledge to contribute immediately to the improvement of controls and the efficiency of an organization. These results provide a call for IS and data analytics programs to offer certifications and minors or serve as required components to an accounting degree program.

MIS departments should work to provide opportunities for accounting students to enroll in

database and SA&D courses to learn skills that will help with ad hoc reporting and the skills necessary to analyze and design efficient systems with adequate controls. Courses with accounting, MIS, and data analytics students would allow for more diverse teams and perspectives while completing projects and presentations. This would also provide administrative benefits as increased enrollment allows options for class sizes and section numbers that may reduce preparation work for faculty.

Analytics departments should work to provide opportunities for accounting students to join their courses. Forecasting was the most widely required skill listed in our sample, indicating that regression and time series would be relevant models for instruction. However, additional research is needed to explore other MIS and BA concepts and skills that would be important for accountants. Courses such as data mining or BI would allow a variety of models to be explored. Such a course would connect well with skills learned in a database course to provide a wide range of skills to produce ad hoc reports. Excel skills are a must for accounting students. Business schools should continue to offer a venue to practice Excel skills while also expanding the student's horizons on the use of other software.

Educators need to continue to emphasize soft skills in their classrooms. While the technical knowledge may be required so are soft skills. A lack of IS knowledge may exclude the jobseeker from many positions, but the knowledge needs to be taught in a manner that allows the student to practice soft skills and interact in a diverse team environment.

The findings provide a framework to evaluate job listings for relevant content related to analytics and IS so that other departments or areas within the college of business can evaluate the need to increase their student's exposure to MIS and BA. Further research is needed to ensure that course offerings are aligned with employers of all graduates. As MIS graduates need to communicate findings across departments, incorporating students from other departments into MIS classrooms or projects may facilitate soft skills and create healthier programs.

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Appendix A: Tables

Code	Instrument Keywords
Management Information Systems	
Database	SQL, Database, Specific Databases (e.g., Access, Oracle, MYSQL), Data Integration, Data Collection, Storage
Report Writing / Generation	Report Writing, Financial Statement Generation, Ad Hoc Reporting, Generate Reports, Compile Reports
Enterprise Architecture	ERP, MRP, Specific ERP Software Mentioned
System Analysis and Design	Systems Analysis, Systems Testing, System and Process Design Improvement, Design Controls
Business Analytics	
Data Analytics	Analytical, Statistics, Forecast, Forecasting, Data Analysis, Ad Hoc Reporting, Data Mining
Excel	MS Office Suite, Spreadsheet, Excel
Soft Skills	
Timeliness	Timely, Efficient, Timeliness, Deadlines
Presentation	Microsoft PowerPoint, Giving and Receiving Feedback, Teaching
Teamwork	Teamwork, Working with Others, Team Environment, Collaboration
Critical Thinking	Creativity, Analytical Skills, Framing Issues, Asking Questions, Probing, Awareness of Ambiguities and Complexities
Accountability	Leadership, Managing, Structuring, Coordinating, Minor to No Supervision

Table 1. Coding Instrument

Code	Total	Firm Type		Experience Level Required		
		National Firms	Local Firms	Entry Level	Some Experience	Very Experienced
MIS						
Database	13%	11%	14%	19%	6%	11%
Report Writing/ Generation	80%	73%	88%	84%	81%	72%
Enterprise System	14%	5%	24%	11%	16%	17%
Systems Analysis & Design	39%	52%	24%	49%	29%	33%
BA						
Data Analytics	87%	91%	83%	89%	87%	83%
Excel	27%	18%	36%	19%	39%	22%
Soft Skills						
Timeliness	62%	61%	62%	65%	61%	56%
Teamwork	76%	82%	69%	76%	77%	72%
Presentation	59%	77%	40%	59%	58%	61%
Accountability	66%	82%	50%	65%	65%	72%
Critical Thinking	77%	80%	74%	78%	81%	67%
N	86	44	42	37	31	18

Table 2. Occurrences of MIS/BA/Soft Skills Codes in the Sampled Job Listings

Research Question	*Answers*
Do recent accounting job listings identify, at a significant level of occurrence, knowledge, skills, and abilities covered by existing Management of Information Systems (MIS) and Business Analytics (BA) courses?	Yes
What MIS courses best benefit the career needs of accountants?	Database Enterprise Systems Systems Analysis & Design
What BA courses best benefit the career needs of accountants?	Data Mining Business Intelligence Excel
What soft skills should be emphasized in MIS and BA coursework to benefit accountants?	Meeting Timeliness Teamwork Skills Ability to Present Accountability Critical Thinking

Table 3. Research Questions and Answers