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# Assessing Student Learning Outcomes in the Introductory Accounting Information Systems Course Using the AICPA's Core Competency Framework

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**ABSTRACT:** This paper describes a unique learning outcome process for the assessment of an undergraduate course in AIS. Learning expectations targeted for assessment are the "functional competencies" promulgated in the AICPA's *Core Competency Framework for Entry into the Accounting Profession* (Framework) (1999). This paper first frames the importance of assessment for motivating faculty to foster "continuous improvement" in student learning, as well as demonstrating accountability to public officials, accreditation bodies, and university administrators. The paper then focuses on a specific example (case study) of AIS course assessment. Evidence of student learning is observed, albeit imperfectly, through triangulation of multiple direct measurements, supplemented by indirect measures such as student self-assessments. Results indicate that students became more competent in certain functional competencies and also reflect that the expected emphasis on certain competencies to be gained in the AIS course required modification to the assessment plan. AIS instructors were also able to leverage assessment information for improving the consistency of course content and pedagogy in future semesters. Triangulation, therefore, provides evidence that the AIS course achieved its student learning goals while meeting departmental objectives, including successfully supporting the AACSB's maintenance of accreditation review for the College of Business.

**Keywords:** AIS; course assessment; AICPA functional competencies; self-assessment.

**Data Availability:** Data are available upon request of corresponding author.

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## I. INTRODUCTION

The pedagogy and content of U.S. accounting programs has been the subject of a continuing debate engaging academics, public accounting firms, and professional accounting organizations for the past several decades (for example, Roy and MacNeill 1967). Periodically surfacing in this debate are suggestive educational frameworks that propose how to improve the formal education of entry-level accountants. Bolt-Lee and Foster (2003) survey the contemporary history of these emerging American frameworks. These works include the American Accounting Association's (AAA's) Bedford Committee Report (1986), the accounting profession's Big 8 White Paper (*Perspectives on Education* 1989), the AAA's Accounting Education Change Commission (1990), and the Institute of Management Accountant's (IMA's) *What Corporate America Wants in Entry-Level Accountants* (1994). The latest iteration of these accounting education frameworks is the *American Institute of Certified Public Accountants' (AICPA's) Core Competency Framework for Entry into the Accounting Profession* (1999). In comparing these frameworks for accounting higher education, Bolt-Lee and Foster (2003) find a common thread—entry-level accountants are not adequately prepared. One area especially deserving of additional attention from educators is the integration of rapidly changing technology within the accounting curriculum manifested in accounting information systems (AIS) courses.

Both U.S. accounting educators and practitioners have long agreed that AIS courses should enable students to become more proficient in using information systems (AAA 1987; Accounting Education Change Commission 1990; AICPA 1996; Albrecht and Sack 2000; Bedford Committee 1986; Borthick 1996; Hastings et al. 2003; International Federation of Accountants 2003). However, because of the widespread proliferation, continual evolution, and a wide variety of information technology (IT) currently used in typical business processes, accounting educators are continually challenged to determine appropriate AIS course content and pedagogy. In responding to the dynamic IT environment, an AIS educator must jointly resolve two basic questions: (1) What competencies should I target in my course, and (2) How can I be assured that these competencies have been addressed as evidenced in student learning outcomes? This study provides one example (case study) of how AIS educators might resolve this dilemma: by focusing on skills-based (rather than content-based) competencies that are included in the *AICPA Core Competency Framework* for AIS learning expectations and then assessing student learning outcomes relative to these expectations.

The *AICPA Core Competency Framework*, like those preceding it, is premised on the argument that learning by students as they prepare for public accounting, business, government, or academic careers is strongly dependent upon the quality of instruction provided them. This framework is innovative in that it supports a paradigm shift from a content-driven to a skills-based curriculum by identifying core functional, personal, and broad business-perspective competencies. It, therefore, is not structured around traditional subject/content areas or accounting sub-disciplines (e.g., AIS, audit, cost, etc.). Advocating a skills-based curriculum versus a content-based curriculum recognizes that the winds of technology and globalization forces are rapidly changing the body of knowledge required by today's professional accountants. Whereas specific knowledge requirements are temporal in nature, the core set of competencies identified by the *AICPA Core Competency Framework* have

long-term value. This shift to skills-based learning is simply a higher-educational version of the old adage “teach a man to fish.”<sup>1</sup>

Prior accounting educational literature has described implementation of assessment programs at both public (DeMong et al. 1994; Stivers et al. 2000) and private (Akers et al. 1997) universities. We add to that literature by providing a detailed description of AIS course assessment that may be used in aiding such implementation. Prior literature has also sought to describe what concepts, topics, and skills are being addressed in AIS courses over time, and those course-related aspects for which a consensus amongst AIS educators may exist, as well as their consistency with the expectations of professionals (Davis and Leitch 1988; Heagy and Rakow 1991; Smith and Bain 1993; Groomer and Murthy 1996; Bain et al. 2002; Hastings et al. 2003). We extend this literature by integrating the Framework’s functional competencies into an AIS course assessment (case study). Finally, accounting researchers have examined particular competencies, as varied as those skills which will enhance students’ prospects of employment (Gammie et al. 2002), to the outcome assessment of an accounting department’s initiative to improve writing skills (Asbaugh et al. 2002). Of note, an entry-level accountant’s need for computer literacy has also been investigated (Larres and Oyelere 1999; Larres et al. 2003). Our focus on AIS course assessment complements this work and may be used, as well, for assessing other accounting courses. Course assessment is viewed as a basic building block for evaluating learning outcomes at the accounting program level and higher. It constitutes a necessary, but not sufficient, condition for implementing a program in outcomes assessment.

Before discussing AIS course assessment, it is appropriate first to take a longer view of assessment in accounting higher education. The purpose of this preface is to describe the assessment process in general, the players in this process, and the potential for misunderstanding and conflict in conducting assessment of student learning outcomes. The paper then focuses on a specific example of AIS course assessment, and uses the *AICPA Core Competency Framework* as one possible means of reducing this potential tension. Next, the paper presents a detailed description of an actual AIS course assessment program and a case study of how assessment information was used to obtain educational objectives. These objectives include supporting the Business College’s maintenance of accreditation review by the Association to Advance Collegiate Schools of Business (AACSB). Finally, we present our conclusions.

## II. MOTIVATION

### Motivational Tension Affecting the Implementation of Learning Outcomes Assessment

A skeptic of measuring student learning outcome assessment might conclude that it is a process of divining the difference between an indefinable or biased standard (i.e., the learning expectation) and an unobservable behavioral attribute. However, the situation may be remedied somewhat with appropriate modifications and assumptions. The problem of measurement error associated with attempting to actually observe student learning may be ameliorated by taking multiple measurements (assessments), i.e., a process of triangulation.

<sup>1</sup> This folk wisdom infers that by providing an individual with the skills necessary to catch fish, you will not have to catch the fish for them. Similarly, teaching content-based curriculum “feeds” the student for the short term, while teaching skills-based curriculum allows students to catch their own fish. This is not to say that content is unimportant, but rather to acknowledge that in today’s rapidly evolving business environment, it is better to focus on the skills required to understand “future” content, rather than to concentrate on the perishable content of today.

On the other side of the analysis, the problem of reaching some consensus on the benchmarks of skill sets deemed appropriate for entry-level accountants can be largely resolved by adopting standards widely accepted by both practicing accountants and academics after a sufficient period of discussion and debate.

Harwood and Cohen (1999) make an important distinction between outcome assessment and classroom assessment. Whereas outcome assessment is *periodically* conducted by administrators to make changes to benefit *future* students and *future* classes, classroom assessment is *continuously* conducted by faculty to make immediate changes to benefit *current* students. That is, classroom assessment is an instructional responsibility to evaluate the learning process and to take the necessary action to ensure that it is both effective and efficient. This is the view held by faculty and can be described as a “bottom-up” approach to assessment.

Public cries for accountability in higher education have led to a shift from evaluating resource inputs, such as entrance examination scores, to educational or learning outcomes. For example, the U.S. Department of Education requires accrediting bodies to include assessment as a component of postsecondary accreditation standards (Apostolou 1999). The state of Georgia’s Board of Regents requires that each institution of higher learning submit comprehensive assessment plans for each major degree program (Stivers et al. 2000). The state of Tennessee mandates assessment of state university graduates not only at the university level, but also at the departmental level within the major (Herring and Izard 1992). This “top-down” push for assessment to satisfy accountability requirements must in the end require appropriate action by classroom instructors practicing “bottom-up” assessment.

The potential for motivational conflict between internal and external assessment user groups may result in significantly diminishing both classroom and learning outcomes assessment. For example, faculty may only “go through the motions” in meeting the assessment requirements that accompany the accreditation process. Conversely, external users may fail to obtain an accurate assessment snapshot if their accountability concerns do not accommodate the faculty’s professional “turf” to ensure continuous improvement in student learning. Integration of assessment requirements as viewed by these two groups is needed. Possibly with this in mind, Harwood and Cohen (1999) suggest two important ways in which classroom assessment may be modified: (1) classroom assessment may be coordinated by administrators at the department or university level; (2) classroom assessment can be integrated with outcomes assessment as part of an overall assessment program.

The AACSB, the major accrediting body for U.S. business schools, acknowledged the requirement for integrating the assessment objectives of external and internal users in the 2005 change to the association’s eligibility procedures and standards for business accreditation. The AACSB uses the term *assurance of learning* standards to promulgate top-down accountability required for accreditation. With regard to *assurance of learning*, the AACSB states in a working draft of the new standards:

The purpose of accreditation (or to demonstrate accountability) is only the third most important reason to assess learning accomplishments. The most important reason to measure learning achievement against specified learning goals is to provide feedback and guidance for individual students ... The second most important function for measures of learning is to assist the school and faculty members to improve programs and courses. (AACSB 2002)

Interestingly, in the final version of this accreditation document published by the AACSB, the relative rankings of assessment’s value that appear in the above paragraph are deleted. If even the AACSB finds it a challenging task to describe assessment’s value to internal and external users, it should come as no surprise that implementing integrated

assessment programs that benefit both internal and external user groups has been even more challenging.

One means of resolving the motivational tension between internal and external constituencies is for accounting educators to adopt a commonly agreed upon set of learning expectations that are sufficiently flexible to satisfy all parties. We suggest that the skills-based competencies included in the *AICPA Core Competency Framework* are well-suited for this purpose. The next section discusses the methodology employed in our example of incorporating the AICPA Core Competency Framework into the departmental assessment plan and the undergraduate AIS course's role in the assessment plan.

### III. METHODOLOGY

#### Departmental Assessment Plan within the Framework

The Framework, adopted by the AICPA in 1999, supports a paradigm shift from a content-driven to a skills-based curriculum by identifying core functional, personal, and broad business-perspective competencies that are universally applicable to a diverse and growing array of accounting career options (AICPA 2004). The AICPA core competencies are depicted in Table 1. An in-depth discussion of these core competencies and the evolution of the Framework appears in Bolt-Lee and Foster (2003).

The Framework provides a suitable foundation for accounting educators to flexibly determine course content and assess how well specific courses meet a student's acquisition of desired skills. The Framework also meets the assessment requirements of accreditors. The AACSB's Director of Accounting Accreditation enthusiastically responded to preliminary reports on the Framework as follows:

The Framework ... takes a broad view of the accounting profession ... It will provide a practical, competency-based approach to curriculum review and sets the stage for student outcome assessment—essential elements of the accreditation review process. (Jane Rubins, AACSB [AICPA 2004])

A skills-based curriculum versus a content-based curriculum is advocated because the body of knowledge routinely accessed by accounting professionals is dynamic and rapidly evolving. This being said, the Framework encompasses such a wide breadth of professional competencies that some selectivity must be exercised by educators in designing an assessment program to ensure manageability. We focus our attention in this paper on the Framework's functional competencies, applicable to the core undergraduate accounting curriculum. A representative listing of these required accounting courses is depicted in Table 2.

TABLE 1  
AICPA Core Competencies

| Type of Competency  |                                     |                                  |
|---------------------|-------------------------------------|----------------------------------|
| Functional          | Personal                            | Broad Business Perspective       |
| Decision Modeling   | Personal Demeanor                   | Strategic/Critical Thinking      |
| Risk Analysis       | Problem Solving and Decision Making | Industry/Sector Perspective      |
| Measurement         | Interaction                         | International/Global Perspective |
| Reporting           | Leadership                          | Resource Management              |
| Research            | Communication                       | Legal/Regulatory Perspective     |
| Leverage Technology | Project Management                  | Marketing/Client Focus           |
|                     | Leverage Technology                 | Leverage Technology              |

**TABLE 2**  
**Undergraduate Course Assessment Schedule**

| Course Number | Course Title                      | Course Description <sup>a</sup>   | Assessment Schedule <sup>b</sup>           |
|---------------|-----------------------------------|---|--|
| Acct 2001     | Introductory Financial Accounting | Emphasis on accounting cycles and financial statement preparation, plant assets, current and long-term liabilities, stockholder's equity and cash flows.  | As required                                |
| Acct 3001     | Intermediate Accounting—Part 1    | Accounting principles underlying preparation of financial statements; their application in measurement and reporting of selected balance sheet items and related revenue and expenditure recognition.       | 2002–2003 and every three years thereafter |
| Acct 3021     | Intermediate Accounting—Part 2    | Accounting for liabilities, income taxes, pensions, leases, stockholder's equity, earnings per share, accounting changes and corrections of errors, and income and balance sheet presentation.              | 2001–2002 and every three years thereafter |
| Acct 3121     | Cost Analysis and Control         | Cost accounting and control for manufacturing firms; cost-volume-profit relationships; standard costs and variance analysis; direct costing; relevant costs; activity-based costing.                        | 2001–2002 and every three years thereafter |
| Acct 3122     | Accounting Information Systems    | Analysis and design of standard accounting systems; emphasis on computerized systems and internal control issues.   | 2003–2004 and every three years thereafter |
| Acct 3221     | Income Tax Accounting I           | Federal income taxation with respect to individuals, income inclusions and exclusions, and statutory deductions in arriving at tax liability.   | 2002–2003 and every three years thereafter |
| Acct 3222     | Auditing                          | Theoretical and practical development of the independent audit function; GAAS; collection and evaluation of audit evidence; understanding internal control; risk assessment; transaction cycles; reporting. | 2003–2004 and every three years thereafter |
| Acct 4121     | Advanced Cost Analysis            | Measurement, interpretation, planning, and control of manufacturing and distribution costs; budgets and budgetary control; comparison of costs of business activities.                                      | 2002–2003 and every three years thereafter |

<sup>a</sup> Partial course description obtained from course catalogue.

<sup>b</sup> Sampling is used in assessment and the same course need not be assessed every year. The three-year assessment plan was adopted because the accounting department had eight courses to assess and spreading out the assessment process helped spread the workload burden for both faculty and administration.

The AACSB (2006a), in a recent working draft of eligibility procedures and standards for business accreditation, recommended that a comprehensive assessment program should include direct measures of student learning but can also be supplemented with indirect measures. Direct measures include exams, projects, assignments, homework, and research papers. Indirect measures include surveys regarding student perceptions of the usefulness of a course. As shown in Table 2, each course need not be assessed annually; the illustrative table provides a schedule for triennial course assessment.<sup>2</sup> This accommodation is also in consideration of the extra time and effort required by instructional faculty in conducting and documenting assessments of student learning.

Table 3 integrates course assessment into the (accounting) program assessment. In addition to the relative weights awarded to each functional competency by each required course, the table also includes consideration for nonrequired accounting electives and required nonaccounting courses that also address the functional competencies. *Ex post* course assessment results may indicate that *ex ante* assigned weights require modification.

### Undergraduate AIS Course Role within the Assessment Plan

Our assessment of an undergraduate AIS course is conducted at a large public university that has recently been reviewed by the AACSB for maintenance of accreditation at the College of Business level. Student enrollment in the College of Business approximates 1,700, of which 25 percent are accounting majors. As previously discussed, the department has adopted the use of the AICPA Framework's core functional competencies for assessing the undergraduate program, assigning various weights to required courses (Table 3) and scheduling course assessment for the accounting sequence using a three-year cycle basis (Table 2). The undergraduate AIS course has been assessed as scheduled for the 2003–2004 academic year.

The AIS course provides three semester credit hours and focuses on the “analysis and design of standard accounting systems; emphasis on computerized systems and internal control issues” (as described in the university's general catalog). Intermediate Accounting—Part 1 (Acct 3001 in Table 3) and Introduction to Management Information Systems (ISDS 1100 in the “other” column in Table 3) are prerequisites for the course. The AIS course is also a prerequisite for Auditing (Acct 3222 in Table 3). Student demand for the AIS course is such that four sections are taught by two instructors each semester. Although the instructors can individually design and tailor course content and pedagogy as they each see fit, both strive to be consistent with each other in topical coverage and grading methods. All sections use the same textbook (*Accounting Information Systems* [Romney and Steinbart 2003]).

Upon commencing the assessment process, both instructors have considered targeted functional competencies in the departmental assessment plan when developing their syllabi. Both include discussion of the competencies in their syllabi, and more specifically, which competencies are emphasized and how they are addressed throughout the semester. Table 4 provides an example of how course material and exercises are linked to competencies addressed in the AIS course. Instructors discuss their respective syllabi with students on the first day of class, specifically emphasizing those competencies that have been targeted in the course. The inclusion of Framework competencies in the syllabi and the associated class discussion results in the following:

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<sup>2</sup> Triennial assessment requires the course to be assessed in the fall and spring semesters every third year.

**TABLE 3**  
**Mapping of AICPA Functional Competencies to Undergraduate Accounting Courses**

| Learning Outcome <sup>b</sup> | Definition  | Course Number and Title <sup>a</sup>   |            |             |           |          |          |            |               |                   |   | Other <sup>d</sup> |                        |
|-------------------------------|---|--|------------|-------------|-----------|----------|----------|------------|---------------|-------------------|---|--------------------|------------------------|
|                               |   | 2001 Prin  | 3001 Int I | 3021 Int II | 3121 Cost | 3122 AIS | 3221 Tax | 3222 Audit | 4121 Adv Cost | 4xxx <sup>c</sup> |   |                    |                        |
| <b>Functional Competency</b>  | <b>Technical Skill</b>  | <b>Degree of Functional Competency Emphasis in Course:</b><br>1 = Light, 2 = Moderate, 3 = Major |            |             |           |          |          |            |               |                   |   |                    |                        |
| Decision Modeling             | Consider issues, identify alternatives, choose and implement solutions    | 1  | 1          | 1           | 3         | 2        | 2        | 2          | 2             | 3                 | 3 |                    |                        |
| Risk Analysis                 | Understand audit and business risks                                       | 1  | 1          | 1           | 1         | 3        | 1        | 3          | 1             | 3                 | 1 | 3                  | FIN 3715               |
| Measurement                   | Knowledge of appropriate measures of performance and applicable standards | 2  | 3          | 3           | 3         | 1        | 3        | 1          | 3             | 3                 | 3 | 3                  |                        |
| Reporting                     | Preparation of meaningful reports or work performed and conclusions       | 2  | 3          | 3           | 3         | 1        | 3        | 1          | 3             | 3                 | 3 | 3                  |                        |
| Research                      | Ability to obtain, understand and apply relevant information              | 1  | 1          | 2           | 2         | 3        | 3        | 3          | 3             | 3                 | 3 | 3                  | ISDS 2000<br>ISDS 2001 |
| Use of Technology             | Ability to use technology for furthering functional competencies          | 1  | 1          | 2           | 2         | 3        | 2        | 3          | 2             | 3                 | 3 | 3                  | ISDS 1100              |

<sup>a</sup> See also Table 2 for course descriptions.  
<sup>b</sup> Based upon the AICPA's *Core Competency Framework* ([www.aicpa.org/edu/corecomp.htm](http://www.aicpa.org/edu/corecomp.htm)).  
<sup>c</sup> 4xxx refers to advanced-level accounting elective.  
<sup>d</sup> "Other" includes all courses in the undergraduate curriculum other than those specifically identified.





**TABLE 4**  
**Example of AIS Course Linkage to AICPA Core Competencies Included in Syllabi**

| <b>Functional Competency<sup>a</sup></b> | <b>Technical Skill<sup>a</sup></b>  | <b>AIS Competency Development</b>  |
|--|---|--|
| Decision modeling                        | Consider issues, identify alternatives, choose and implement solutions    | Moderate emphasis: Decision modeling assignment using spreadsheet software (Excel™).   |
| Risk analysis                            | Understand audit and business risks                                       | Major emphasis: Prevention and detection of information processing errors and employee fraud. Internal control concepts dealing with the detection, prevention and correction of errors.   |
| Measurement                              | Knowledge of appropriate measures of performance and applicable standards | Light emphasis   |
| Reporting                                | Preparation of meaningful reports on work performed and conclusions       | Light emphasis   |
| Research                                 | Ability to obtain, understand and apply relevant information              | Major emphasis: Use of documentation techniques to evaluate systems and make needed recommendations for proper internal controls.  |
| Use of technology                        | Ability to use technology for furthering functional competencies          | Major emphasis: Develop spreadsheets (Excel), databases (Access™), ERP accounting software (Great Plains Dynamics™) and other technological skills useful in today's business environment. |

<sup>a</sup> Based upon the AICPA's *Core Competency Framework* ([www.aicpa.org/edu/corecomp.htm](http://www.aicpa.org/edu/corecomp.htm)).

- (1) The instructor is forced to focus on targeted competencies and how the AIS course could assist students in developing those competencies.
- (2) Students are informed from the beginning as to what skills are most valued for those entering the accounting profession and to what degree each of the competencies are addressed in the AIS course.
- (3) Documentation is generated that targeted competencies are incorporated into the course, enabling an "audit trail" from the department's assessment plan, through the course syllabus, and eventually to learning outcome measures.

Additionally, while discussing the syllabus, instructors inform students that they can gain certain skills while covering the following representative topics covered in the undergraduate AIS course: (1) Introductory Accounting Information System Concepts, (2) E-Commerce, (3) Revenue, Expenditure, and General Ledger Reporting Business Processes, (4) Systems Development Life Cycle, (5) Systems Development Documentation Techniques, (6) Data Processing, Data Modeling, and Databases, (7) Computer Fraud and Security, (8) Internal Control Concepts, and (9) Computer Based Information Systems Control. Prior studies have consistently identified these topics as typically covered in an undergraduate AIS course (Davis and Leitch 1988; Heagy and Rakow 1991; Smith and Bain 1993; Groomer and Murthy 1996; Bain et al. 2002; Hastings et al. 2003).

AIS students are graded through a variety of direct measures, including:

- Three exams (including a comprehensive final exam)
- Arens and Ward's *Computerized Accounting Using Microsoft Great Plains Dynamics* (2001) Tutorial Assignments
- Capital Budgeting Assignment with Alternative Scenarios Analyzed Using Excel
- Flowcharting Assignment
- Entity-Relationship Data Modeling Assignment
- Access Database Assignment
- Internal Control Assignment
- Quizzes and Homework

The discussion of assignments (which are linked to competencies in the syllabus) demonstrates that the instructors seek to assist students in learning specific topics through scheduled hands-on experience. Grading weights slightly differ between the two instructors. However, exams represent approximately 65–70 percent of a student's total grade, while assignments represent approximately 25–30 percent, and quizzes/homework represent approximately 5 percent. Exams include multiple choice, short-answer, listing, and/or essay questions.

### **AIS Course-Specific Direct Outcome Measures**

To provide direct measures of assurance of learning of targeted competencies, each instructor maps certain course-required measurable activities (exams and assignments) to functional competencies (i.e., decision modeling, risk analysis, leveraging technology, etc.). The mapping process is similar in concept with the AACSB's approved use of rubrics (AACSB 2006b). A rubric involves evaluation of a particular activity along a number of chosen dimensions (Dodge 2001). In this case, the chosen dimensions are the functional competencies. As previously noted, the AICPA's core competencies have also been received favorably by AACSB officials. Since the competency-classified questions and problems are tested as part of the normal course evaluation process, the learning assessment to the students is transparent and does not require any additional work for them. As for the instructor, they must now perform two evaluations: the normal evaluation of examination performance by student used for determining grades, and a second evaluation of student performance for each of the core competencies. This dual evaluation process can be efficiently performed by utilizing a spreadsheet.

Consistent with the concept of a rubric, the instructors recognize during the mapping of course-embedded assessment measures that points from some assignments typically applied to more than one competency. For example, Arens and Ward's *Computerized Accounting Using Microsoft Great Plains Dynamics* (2001), Chapter 6 covers internal controls in a computerized environment. The points awarded from this assignment can be split 50 percent risk analysis and 50 percent leveraging technology. Another example is a capital budgeting assignment done using Excel. One instructor uses the capital budgeting scenario to emphasize many of the Excel tools (conditional formatting, "If" statements, NPV functions, etc.) available. The allocation for this project by the instructor is determined to be 80 percent leveraging technology and 20 percent decision modeling. Table 5 provides the point allocations for both instructors for one of the semesters.

A number of useful insights are gained from the process of mapping points to functional competencies. Four of the course's functional competencies align well with the departmental assessment plan. Both Risk Analysis and Leveraging Technology are assigned major emphasis by the department assessment plan and when combined constituted approximately

**TABLE 5**  
**Mapping of Course Activities to Functional Competencies by Instructor and Activity Type**  
**Using the Distribution of Points Possible in the Course**

| <u>Activity</u>                   | <u>Decision Modeling</u> | <u>Risk Analysis</u> | <u>Measurement</u> | <u>Reporting</u> | <u>Research</u> | <u>Leveraging Technology</u> | <u>Total</u> |
|-----------------------------------|--------------------------|----------------------|--------------------|------------------|-----------------|------------------------------|--------------|
| <b>Panel A: First Instructor</b>  |                          |                      |                    |                  |                 |                              |              |
| Assignments                       | 55.50                    | 46.50                | 0.00               | 19.00            | 0.00            | 149.00                       | 270.00       |
| Exam 1                            | 131.00                   | 52.00                | 0.00               | 25.00            | 0.00            | 12.00                        | 220.00       |
| Exam 2                            | 180.00                   | 0.00                 | 0.00               | 0.00             | 0.00            | 40.00                        | 220.00       |
| Final Exam                        | 59.00                    | 145.00               | 0.00               | 4.50             | 0.00            | 43.00                        | 251.50       |
| Total Points                      | 425.50                   | 243.50               | 0.00               | 48.50            | 0.00            | 244.00                       | 961.50       |
| Percent of Total                  | 44.25%                   | 25.33%               | 0.00%              | 5.04%            | 0.00%           | 25.38%                       | 100.00%      |
| <b>Panel B: Second Instructor</b> |                          |                      |                    |                  |                 |                              |              |
| Assignments                       | 111.50                   | 37.00                | 0.00               | 13.50            | 0.00            | 88.00                        | 250.00       |
| Exam 1                            | 86.50                    | 59.00                | 0.00               | 22.00            | 0.00            | 57.50                        | 225.00       |
| Exam 2                            | 201.00                   | 0.00                 | 0.00               | 0.00             | 0.00            | 24.00                        | 225.00       |
| Final Exam                        | 35.00                    | 200.00               | 0.00               | 5.00             | 0.00            | 10.00                        | 250.00       |
| Total Points                      | 434.00                   | 296.00               | 0.00               | 40.50            | 0.00            | 179.50                       | 950.00       |
| Percent of Total                  | 45.68%                   | 31.16%               | 0.00%              | 4.26%            | 0.00%           | 18.89%                       | 100.00%      |



50 percent of each instructor's assigned points. Additionally, both Measurement and Reporting are also consistently weighted with the departmental assessment plan. These competencies are assigned light emphasis in the plan and only comprised 5 percent of each instructor's points.

A slight deviation is noted with Decision Modeling, which is assigned moderate emphasis by the departmental assessment plan but receives approximately 45 percent of each instructor's points. A more notable deviation is discovered when analyzing Research. Research is given major emphasis in the departmental assessment plan but is assigned zero points by both instructors. In hindsight, after evaluating all the course material covered during the semester, neither instructor believes that any assignment fell directly under the definition of Research as described in the Framework. A likely reason for this deviation is that both instructors joined the accounting faculty after the assessment plan had been designed and therefore had no input in the plan's development and weighting. As a result of the mapping process, the instructors have jointly recommended to the department's assessment committee that the weight for Decision Modeling be adjusted to major emphasis and that for Research be adjusted to light emphasis. This example of mapping course activities to competencies illustrates how one of the outcomes from assessing student learning can be modification and improvement to the assessment plan itself.

Other insights are gained from the mapping of course-embedded assessment measures. One instructor has allocated more points than the other to Leveraging Technology (25.38 percent versus 18.89 percent) while the other instructor has allocated more points to Risk Analysis (31.16 percent versus 25.33 percent). Both of these functional competencies are assigned "major" emphasis in the course, and the differences between competencies by instructor are approximately the same. Such differences are attributed to the following:

- Instructors differ in their method of allocating points between competencies from activities that use technology (for example, assignments that used Arens and Ward Great Plains Dynamics, Access, and Excel).
- Instructors have individual preferences for emphasizing some competencies more than others in the course. For example, one instructor purposely emphasizes risk analysis to a greater degree than in the past because of the importance placed on internal controls by the recently passed Sarbanes-Oxley Act of 2002.

The two AIS instructors have discussed the results of their assessments in detail, each instructor agreeing to keep the overall course assessment results in mind when developing their AIS course content in future semesters, thereby ensuring course consistency between sections. Therefore, just as the mapping process helps refine the department's assessment plan, the mapping process also enables the instructors to adjust their own pedagogy for future semesters.

### **AIS Course-Specific Indirect Outcome Measures**

The AACSB (2006a, 67) states:

As part of a comprehensive learning assessment program, schools may supplement direct measures of achievement with indirect measures. Such techniques as surveying alumni about their preparedness to enter the job market or surveying employers about the strengths and weaknesses of graduates can provide some information about perceptions of student achievement.

In order to supplement our direct measures and help triangulate our findings, we incorporate several indirect measures of assessment, as well. These measures include student

surveys, CPA examination pass rates and the AACSB maintenance of accreditation recommendations/results.

In regard to the student surveys, the AIS instructors have taken multiple measures with respect to student learning outcomes at both the beginning and end of the semester. Using this pre/post experimental design, the instructors seek to determine whether the AIS course improves students' self-assessments of how targeted functional competencies have changed over the semester. The instructors designed a survey instrument that first provides the definition of each functional competency as found in the Framework. After each respective definition, several declarative statements are provided; students then are asked to self-assess how competent they perceive themselves to be for each functional competency using a Likert-type scale of 1 (Strongly Disagree) to 7 (Strongly Agree). Statements are based directly on bulleted descriptions of competency elements provided in the Framework, with the preamble, "I am/am *not* competent at," added to the beginning of each statement. Positive and negative statements are generally alternated to assist in holding students' attention when completing the survey.

Students completed the survey outside of class during the first week of the semester and were given a quiz grade to encourage motivation. Although students receive points for completing the survey, they were told that their survey responses had no impact on their course grade. Students were given the same survey again during the last week of the semester, with specific instructions to only consider the impact of the AIS course when re-assessing functional competencies.

Since the AICPA is a major stakeholder in the CPA examination process and also for promoting the core competencies among accounting educators, CPA exam pass rates should be a good indicator of whether the core competencies are obtained. One of the co-authors has been solicited by the AICPA representatives to submit questions for the CPA examination. To help prepare for writing the questions, the co-author has obtained several CPA examination study guides from various sources (e.g., Becker 2005, Gleim 2003, Bisk 2002) and has noted that the course content covered in the undergraduate AIS course maps well into both the Auditing and Business Economic Concepts sections of the CPA exam. It should be noted that the CPA exam pass rates are an indirect measure of learning because one cannot directly link individual student performance to pass rates. For comparative purposes, the CPA exam pass rates have been obtained for the university in this study, as well as for schools in the same state, and for the national pass rates.

Lastly, the results and recommendations of the AACSB review team for the College of Business' maintenance of accreditation review (required every five years) in early 2006 are taken into consideration (the Department of Accounting does not have separate accreditation). The departmental assessment plan has been in place for three years at the time of the maintenance review. The next section discusses the results from the direct and indirect measures discussed above.

#### IV. RESULTS

##### AIS Course-Specific Direct Outcome Measures

The instructors have simultaneously conducted two ongoing evaluation processes during the semester: the normal evaluation of academic performance by students used for determining grades and a second evaluation (assessment) of students' aggregate performance for each of the functional competencies targeted by the instructor. Insights are gained from examining how well students performed within each type of activity by functional competency area by instructor (Table 6).

**TABLE 6**  
**Student Learning Outcomes Mapped to Functional Competencies by Instructor and Activity Type Using the Distribution of Points Awarded during the Semester**

| Activity                                     | Decision Modeling | Risk Analysis | Measurement | Reporting | Research | Leveraging Technology | Total   |
|--|-------------------|---------------|-------------|-----------|----------|-----------------------|---------|
| <b>Panel A: First Instructor</b>             |                   |               |             |           |          |                       |         |
| Assignments                                  | 47.58             | 39.74         | 0.00        | 16.26     | 0.00     | 132.84                | 236.43  |
| Exam 1                                       | 100.85            | 37.22         | 0.00        | 18.04     | 0.00     | 7.41                  | 163.52  |
| Exam 2                                       | 131.22            | 0.00          | 0.00        | 0.00      | 0.00     | 25.70                 | 156.92  |
| Final Exam                                   | 75.24             | 107.37        | 0.00        | 3.29      | 0.00     | 34.31                 | 220.22  |
| Total Points                                 | 354.90            | 184.33        | 0.00        | 37.59     | 0.00     | 200.27                | 777.09  |
| Percent of Total                             | 45.67%            | 23.72%        | 0.00%       | 4.84%     | 0.00%    | 25.77%                | 100.00% |
| Percent Correct of Total in Table 5, Panel A | 83.41%            | 75.70%        | 0.00%       | 77.50%    | 0.00%    | 82.08%                | 79.67%  |
| <b>Panel B: Second Instructor</b>            |                   |               |             |           |          |                       |         |
| Assignments                                  | 99.16             | 34.17         | 0.00        | 12.73     | 0.00     | 79.78                 | 225.84  |
| Exam 1                                       | 66.30             | 37.51         | 0.00        | 14.38     | 0.00     | 43.23                 | 161.42  |
| Exam 2                                       | 148.89            | 0.00          | 0.00        | 0.00      | 0.00     | 21.00                 | 169.89  |
| Final Exam                                   | 26.64             | 140.09        | 0.00        | 4.05      | 0.00     | 7.84                  | 178.62  |
| Total Points                                 | 340.99            | 211.77        | 0.00        | 31.16     | 0.00     | 151.85                | 735.77  |
| Percent of Total                             | 46.34%            | 28.78%        | 0.00%       | 4.24%     | 0.00%    | 20.64%                | 100.00% |
| Percent Correct of Total in Table 5, Panel B | 78.57%            | 71.54%        | 0.00%       | 76.94%    | 0.00%    | 84.60%                | 77.45%  |



Table 6's results depict a consistency between instructors across the targeted competencies, ranging from 75.70 percent to 83.41 percent for one instructor and from 71.54 percent to 84.60 percent for the other instructor. The AACSB (2006a) provides examples of learning goals and direct measures of achievement. In these examples, the AACSB states that direct measures can provide pass/fail indicators of achieving learning goals. Based on the grading scale used by both instructors for assigning letter grades for the course, the instructors are able to assess in these terms how well students have learned the targeted competencies.

Both instructors used the same percentage grading scale during the semester: an A for 90 percent or better, a B for 80 percent or better but less than 90 percent, a C for 70 percent or better but less than 80 percent, etc. The results in Table 6 show that the mean percentage scores fell in the B and C letter grades, suggesting that students, on average, have learned the functional competencies to the degree stressed in the undergraduate AIS course. While satisfied with the overall results, both instructors note that risk analysis is the functional competency that students found most difficult to master. The instructors conclude that this competency likely needs further attention in future semesters to increase student learning, especially since this competency has a major emphasis in the course. The value in using these measures is gained when used for relative or comparative purposes: among competencies addressed, between instructors (assuming similar assessment instruments were used), and over time. As a result of going through this process, both instructors believe that mapping course activities to functional competencies and measuring outcomes has a very positive impact on improving the AIS course and aligning students' skill sets with the needs of the profession.

### **AIS Course-Specific Indirect Outcome Measures** ***Students Self-Assessment in the AIS Course***

Scores for all elements within a competency category are totaled, and a mean score for both pre- and post-survey responses are calculated. Multiple self-assessment measures are therefore captured for each functional competency. Table 7 provides results for comparing means of functional competencies examined at both the beginning and end of the semester.<sup>3</sup>

Beginning of semester (pre) mean scores are examined to determine the students' self-assessments of competencies. The Pre Mean Scores column of Table 7 reflect that students feel they are significantly more competent ( $p < .10$ ) at Decision Modeling (4.83) and Reporting (4.89) than they are at Leveraging Technology (4.12) and Risk Analysis (4.23). While Measurement and Research is larger than Leveraging Technology and Risk Analysis, they are not significantly larger, nor are they significantly different from Decision Modeling or Reporting.

The Difference values of Table 7 reflect that students, in general, report a significant increase in each competency (pre mean score versus post mean score) after taking the AIS

<sup>3</sup> Only students completing both the pre and post surveys are included in the analysis. Tests for normality of collected data are satisfied.

**TABLE 7**  
**Pre versus Post Mean Scores, Comparisons and Difference Scores, Comparisons for Each Functional Competency**

| <b>Functional Competency</b> | <b>Pre Mean Score<sup>a</sup></b> | <b>Post Mean Score<sup>b</sup></b> | <b>Difference<sup>c</sup></b> |
|------------------------------|-----------------------------------|------------------------------------|-------------------------------|
| Decision Modeling            | 4.83 <sup>b</sup>                 | 5.48 <sup>c</sup>                  | 0.65 <sup>a</sup>             |
| Risk Analysis                | 4.23 <sup>a</sup>                 | 5.44 <sup>c</sup>                  | 1.21 <sup>b</sup>             |
| Measurement                  | 4.51 <sup>ab</sup>                | 5.17 <sup>c</sup>                  | 0.66 <sup>a</sup>             |
| Reporting                    | 4.89 <sup>b</sup>                 | 5.57 <sup>c</sup>                  | 0.68 <sup>a</sup>             |
| Research                     | 4.61 <sup>ab</sup>                | 5.33 <sup>c</sup>                  | 0.72 <sup>a</sup>             |
| Leveraging Technology        | 4.12 <sup>a</sup>                 | 5.39 <sup>c</sup>                  | 1.27 <sup>b</sup>             |

<sup>a</sup> Pre mean scores are students' responses to self assessments (Likert-type scale 1 to 7) of their functional competencies at the beginning of the semester. Different letters represent significantly different pre mean scores at  $p$ -value  $< .10$ . Thus, Risk Analysis and Leveraging Technology (superscripts of "a") were both significantly less than Decision Modeling and Reporting (superscripts of "b") pre mean scores at the beginning of the semester. Measurement and Research (superscripts of "ab") were not significantly different from the other four functional competencies pre mean scores at the beginning of the semester.

<sup>b</sup> Post mean scores are student's responses to self assessments (Likert-type scale 1 to 7) of their functional competencies at the end of the semester. Different letters represent significantly different pre mean scores at  $p$ -value  $< .10$ . Since all the letters were the same, there were no significant post mean scores across functional competencies at the end of the semester. Additionally, all post mean scores at the end of the semester were significantly greater than the pre mean scores at the beginning of the semester.

<sup>c</sup> The difference (increase) from the beginning of the semester to the end of the semester mean scores were compared across functional competencies. Different letters represent significantly different changes in mean scores at  $p$ -value  $< .001$ . Thus, the increase in mean scores of Risk Analysis (1.21) and Leveraging Technology (1.27—superscripts of "b") were both significantly greater than the increases in the other four functional competencies (superscripts of "a").

course (all  $p$ -values  $< 0.001$ ).<sup>4</sup> Additionally, Table 7 shows that while all self-assessed competencies significantly increase, the amount (difference) of increase is not the same. The increases for Risk Analysis (1.21) and Leveraging Technology (1.27) are significantly higher than that of the other four competencies.

The Post Mean Scores column of Table 7 shows no significant difference between post mean scores. Also, Risk Analysis and Leveraging Technology no longer represent the lowest mean scores as in the pre survey. That is, the students perceive that their Risk Analysis and Leveraging Technology skills have caught up with their other functional competencies. The supplemental results of the student survey help support the direct measure findings.

Examining student self-assessments of functional competencies also provides useful insights for the instructors. Table 8 depicts pre- and post-means for each competency area by instructor. With the exception of Measurement, no competency differences are observed between instructors at the beginning of the semester. At the end of the semester, one

<sup>4</sup> It is anticipated that Decision Modeling, Risk Analysis, and Leveraging Technology will display significant increases in post scores based on the activity mapping discussed previously. However, it is not anticipated that Measurement, Reporting, and Research will also display significant increases in post scores. One possible explanation for this unexpected finding is that approximately 33 percent of the students are currently enrolled in course 3121 (Cost Analysis and Control), which has a major emphasis on Measurement and Reporting. Similarly, 30 percent are currently enrolled in course 3221 (Income Tax Accounting I), which has a major emphasis on Measurement, Reporting, and Research. Even though the students are informed to "only consider the impact of the AIS course," they may not have been able to completely disentangle skills garnered from other courses concurrently taken. While the material covered in other courses may have contaminated end-of-semester survey results, the two competencies that demonstrate the greatest increases, Risk Analysis and Leveraging Technology, are those strongly emphasized in the AIS course, and do not receive such emphasis in other accounting courses that can be taken concurrently.



**TABLE 8**  
**Pre and Post Mean Scores for Each Functional Competency—Measuring Differences between Instructors**

| <b>Functional Competency<br/>Pre- and Post-Mean Scores</b> | <b>First<br/>Instructor</b> | <b>Second<br/>Instructor</b> | <b>Two-tailed<br/>p-value<sup>a</sup></b> |
|--|-----------------------------|------------------------------|---|
| <b><i>Decision Modeling</i></b>                            |                             |                              |   |
| Pre  | 4.90                        | 4.76                         | 0.495                                     |
| Post   | 5.30                        | 5.64                         | <b>0.017</b>                              |
| <b><i>Risk Analysis</i></b>                                |                             |                              |   |
| Pre  | 4.23                        | 4.23                         | 0.996                                     |
| Post   | 5.24                        | 5.63                         | <b>0.036</b>                              |
| <b><i>Measurement</i></b>                                  |                             |                              |   |
| Pre  | 4.71                        | 4.32                         | <b>0.095</b>                              |
| Post   | 5.01                        | 5.32                         | <b>0.061</b>                              |
| <b><i>Reporting</i></b>                                    |                             |                              |   |
| Pre  | 5.01                        | 4.79                         | 0.341                                     |
| Post   | 5.55                        | 5.59                         | 0.828                                     |
| <b><i>Research</i></b>                                     |                             |                              |   |
| Pre  | 4.73                        | 4.51                         | 0.257                                     |
| Post   | 5.21                        | 5.44                         | 0.169                                     |
| <b><i>Leveraging Technology</i></b>                        |                             |                              |   |
| Pre  | 4.17                        | 4.08                         | 0.714                                     |
| Post   | 5.27                        | 5.52                         | 0.254                                     |

<sup>a</sup> Bolded p-values are significant < 0.10.

instructor's students report significantly higher levels of competence in Decision Modeling, Risk Analysis, and Measurement (which reverse from the beginning of the semester). However, the students of the other instructor perform better based on the direct measurement data in Table 6. When multiple instructors teach a course and consistency in instruction across sections is desired, this assessment information can be informative to the instructors involved. This result has motivated the two instructors to discuss their pedagogical approaches to teaching certain course material that focus on specific competencies; continued discussions of this nature will enhance consistency across sections, and can also be viewed as taking advantage of "best practices" to improve pedagogy. It should be emphatically stated, at this point, that the sharing of assessment information among faculty as described above can only take place in an atmosphere of mutual trust. We suggest that this environment probably cannot exist if assessment information is used by administrators for reasons other than continuous improvement (i.e., teaching evaluations, faculty pay raises, etc.).

#### **CPA Examination Pass Rates**

For comparative purposes, the CPA exam pass rates have been obtained for the university and schools in the same state, along with the national pass rates for January through May 2005. This timeframe is selected because students who took the AIS course during the period of assessment (academic year 2003–2004) are likely to have taken the CPA examination during this period. Performance on the CPA exam is affected by multiple factors, so it is important not to attribute too much weight to one undergraduate accounting class. However, the results in Table 9 reflect that the pass rates for the two sections (Auditing [AUD] and Business and Economic Concepts [BEC]) that the undergraduate AIS course material appears to map well into displays significantly higher pass rates than both

**TABLE 9**  
**CPA Examination Pass Rates**

| <b>Location</b>  | <b>CPA Examination Section*</b> |            |            |            |
|--|---------------------------------|------------|------------|------------|
|  | <b>AUD</b>                      | <b>BEC</b> | <b>FAR</b> | <b>REG</b> |
| Pass rates of the University of the current study <sup>b</sup>                                   | 60%                             | 46%        | 39%        | 38%        |
| Pass rates for schools in the same state (excluding the university of this article) <sup>b</sup> | 36%                             | 36%        | 41%        | 34%        |
| National pass rates <sup>c</sup>   | 43%                             | 43%        | 40%        | 39%        |

\* *AUD* = Auditing;  
*BEC* = Business and Economic Concepts;  
*FAR* = Financial Accounting and Reporting; and  
*REG* = Regulation.

<sup>b</sup> University and State pass rates were calculated based on data gathered by NASBA for Jan–May 2005.

<sup>c</sup> National rates were calculated using a report obtained from the AICPA Winter/Spring 2006 Issue of the CPA Examination Alert at the website: <http://www.cpa-exam.org/alerts/download/cpaalertwinterspring06.pdf>. An average was calculated for the time period of Jan–May 2005 for comparative purposes.

the combined schools in the same state and the national average. While individual students' scores can not be identified, these results are consistent with the direct measures and that the departmental goals of functional competencies, as emphasized by the AIS course, are being obtained by the students. This illustrates the value of triangulation using an indirect measure to supplement direct measures.

#### ***AACSB Maintenance of Accreditation Recommendations/Results***

Our study of the assessment of an undergraduate AIS course has been conducted at a university that was under accreditation maintenance review during early 2006 by the AACSB at the College of Business level. The College of Business recently was informed by the AACSB that the review was successful. The maintenance of accreditation final report contained mainly comments of constructive criticism, with nothing noted regarding any deficiencies in the Accounting Department's assessment plan that has been developed as the College of Business' prototype to be subsequently duplicated throughout all other departments. The successful maintenance review indicates that the methods documented here are acceptable for assessing learning outcomes by the AACSB.

In summary, the combination of (1) mapping course activities to functional competencies, (2) directly measuring multiple outcomes in these activities, (3) supplementing direct measures with multiple student self-assessments, (4) comparing CPA exam pass rates of the university to that of other state schools and the national average, and (5) considering feedback from a recent AACSB maintenance of accreditation review provide a consistent theme that targeted competencies are indeed addressed in the AIS course as prescribed in the department's assessment plan. Students appear to be developing specific competencies and perceive themselves as doing so. This process also provides evidence that the accounting department's assessment plan as implemented in this study should be modified by increasing the emphasis on Decision Modeling and decreasing the emphasis on Research in the AIS course. Information sharing among faculty also provides insights for individual instructors to reflect on the degree to which they emphasize certain competencies while ensuring that course material and activities adequately emphasize those most relevant to the AIS course. While no assessment measure can be found to be perfect, the multiple

measures observed in this AIS course assessment provide important feedback useful for validating course content and pedagogy while highlighting opportunities for improvement.

## V. CONCLUSION

Assessment of student learning outcomes will remain in the spotlight for the foreseeable future for both internal and external users. Mark Yudof, Chancellor of the University of Texas System expects an increased emphasis on accountability in higher education and has responded by initiating an annual accountability symposium (Chronicle of Higher Education 2004). As evidenced by the recent sea change in AACSB accreditation standards, accreditation bodies will demand that schools show how students meet the learning goals for their respective degree programs. Whereas it will remain the obligation of students to meet the expectations embodied in the institution's stated learning goals, it will remain the obligation of the faculty to monitor student performance to ensure that these learning goals are respected.

We assume that some motivational tension between internal and external users of assessment information is unavoidable when these groups are stereotypically represented by pragmatic public officials and administrators on one hand and idealistic, independent academics on the other. However, this tension can be recognized and managed through accommodating provisions and professional courtesy. Each user group can acknowledge the validity of the other's stake in assessment. Internal users can design and coordinate assessment efforts to satisfy the accountability requirements shouldered by external users. External users can recognize that monitoring student learning is a closely held professional responsibility that faculty must continually strive to fulfill and can provide these internal users with the flexibility needed to do so. We suggest that such flexibility in assessing accounting programs is provided by the AICPA's *Core Competency Framework for Entry into the Accounting Profession* (1999) and have provided an example of how the Framework may be integrated into AIS course assessment.

Although assessment measurements must be triangulated through multiple instruments and observations of direct measures that can be supplemented by indirect measures, we posit that systematic and coordinated course assessment of the undergraduate accounting sequence is the *sine quo non* of a viable assessment program that meets the needs of all user constituencies. Within this sequence, the AIS course constitutes an essential element. It is difficult to overstate how significant developments in IT have impacted the nature and scope of accountants' daily work. Given AIS's critical importance in preparing graduates to enter today's dynamic and technologically-intensive business world, we have concentrated on providing a detailed description of AIS course assessment. We believe the assessments documented in this study can be used in other courses, as well.

Multiple direct and indirect measures are developed and implemented to demonstrate AIS course assessment, and in particular, how well students master the competencies needed by the accounting profession as defined in the AICPA's Framework. AIS instructors include the Framework's functional competencies in their syllabi, an activity that aids both instructor and student in clearly communicating those skills to be targeted in the course. Course-embedded graded activities (i.e., direct measures) are mapped to competencies to determine the degree to which targeted competencies are indeed being emphasized in addition to how well students responded. Student self-assessments are also measured at the beginning and end of the semester as a supplement to the direct measures for examining whether students perceive that they had improved in the targeted competencies. Both CPA exam pass rates and the AACSB maintenance of accreditation review are also examined. Collectively, these

measures provide relevant feedback for faculty, needed for continuously improving the AIS course and for signaling recommended modifications to those monitoring the department's assessment plan.

In summary, we would do well to heed the following advice given frequently by assessment academic Doug Eder in his workshops: "Assessment works best when it is embedded in teaching and learning and when it provides feedback that is useful. If it does not have at least these two properties, then assessment is as difficult and time consuming as trying to juggle dogs."

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