An Approach to Meeting AACSB Assurance of Learning Standards in an IS Core Course

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ABSTRACT

AACSB accreditation is a much sought designation by business schools in the United States, and increasingly, around the world. Beginning in 2003, AACSB changed its focus on the business curriculum from an assessment of inputs to an assessment of outputs. This change has greatly increased the demands on faculty because programs must now demonstrate learning outcomes, not just what students are taught. The purpose of this paper is to present an efficient and effective method to assess learning outcomes in an IS core (required) course in the undergraduate program, by seeing how an accredited mid-western state university developed and implemented a course to meet the new AACSB requirements. We describe the process used to assess learning outcomes and how the results of the assessment are used to improve learning outcomes. We also describe how the IS course assessment ties in to learning assessment of the undergraduate program as a whole.

Keywords: AACSB, Accreditation, Course Evaluation, Evaluation Assessment, Foundation course, Learning goals & outcomes.

1. INTRODUCTION

Accreditation by the Association to Advance Collegiate Schools of Business (AACSB) is much sought after by business schools. However, only 35% of four-year undergraduate business programs in the United States have AACSB accreditation. All accredited business schools share a common purpose – to prepare students for professional, societal, and personal lives. However, AACSB recognizes that different business schools may have different missions. As such, schools that intend to obtain or retain AACSB accreditation must develop a clear mission, develop a structured set of processes to set educational goals consistent with its mission, and assess the degree to which students meet these educational goals. A school's achievement of its educational goals is an important consideration for accreditation.

To be accredited, a business school must meet AACSB standards. In 2003, AACSB significantly revised its standards to require a business school seeking to acquire or maintain accreditation to meet standards in three general areas: 1) the Strategic Management Standards verify that the school focuses its resources and efforts toward a defined mission as embodied in a mission statement, 2) the Participants Standards ensure that the school maintains a mix of both student and faculty participants that achieve high quality in the activities that support the school's mission, and 3) the Assurance of Learning Standards (ALS) ensure that the school sets student learning goals, assesses student achievement of these goals, and addresses the disparity

between the goals and student achievement (http://www.aacsb.edu/).

The most significant change mandated by AACSB is the requirement that schools meet the Assurance of Learning Standards. By introducing ALS, AACSB changed its focus on the business curriculum from an assessment of inputs (i.e., what is taught during the course) to an assessment of outputs (i.e., what the student knows upon completing the course). This change has significantly increased the demands on faculty at institutions seeking to gain or maintain AACSB accreditation. Under the old standards (assessment of inputs), the demands on faculty went little beyond the provision of course syllabi. However, under the new ALS, faculty are required to set learning goals, assess student achievement of these goals, and address areas in which student achievement of goals is deficient. Specifically, AACSB accreditation teams will "evaluate how well the school accomplishes the educational aims at the core of its activities. The learning process is separate from the demonstration that students achieve learning goals." (AACSB-International, 2010, pg. 58)[1].

Assessment of learning goals requires the collection, review, and use of information about educational programs undertaken to improve student learning and development (Palomba and Banta, 1999). Therefore, a school must develop processes that use assessment data to facilitate continuous improvement. As a consequence, faculty must develop formal methods to measure student learning, and, as we describe later, determine how to use learning assessment results to improve their courses.

Typically, undergraduate business programs include one or two Information Systems (IS) courses in the business core. Until recently, IS core course discussions among academics have centered on inputs, notably, course content and delivery (Silver, et al., 1995, Stohr, et al., 1990). Recently, however, there has been some discussion of assessment (Beard, et al., 2008, White, et al., 2008). White et al. (2008) provide a concise but useful overview of different types of assessment, while Beard et al. (2008) describe how soft IS skills can be assessed. Outcome assessment is complicated by the fact that core courses in undergraduate business programs are typically taught by multiple faculty members in a single semester (because of the large number of sections that are usually offered). This fact alone can make the assessment of course learning outcomes difficult because the faculty may disagree about content, delivery, and assessment method.

The purpose of this paper is to help IS faculty charged with assessing outcomes, in an effort to meet the new ALS requirements, by describing an efficient and effective method developed and implemented at an accredited mid-western state university for an IS core (required) course in the undergraduate business program.[2] We describe how the outcomes of the IS course were developed in the context of a school's mission and the educational outcomes for its undergraduate business program, and how the content, delivery, and assessment of the course were implemented while allowing faculty members some flexibility on each dimension. In addition, we describe the process used to assess student learning in the course and how the results of the assessment are used to improve learning. Finally, we describe how the IS course assessment ties in to learning assessment of the undergraduate program as a whole.[3]

2. BACKGROUND

2.1 AACSB Assessment Changes

AACSB made significant changes in its standards in 2003 and 2010. These changes require that schools now use well-documented, systematic processes to develop, monitor, evaluate, and revise the substance and delivery of the curricula of degree programs and assess the impact of the curricula on learning (AACSB-International, 2010, Standard 15, pg. 70). Schools must have a systematic process for curriculum management and for developing learning experiences in knowledge and skills areas that would normally be found in undergraduate degree programs (AACSB-International, 2010, Standard 15, pg. 70). The use of the word "normally" allows for variation based on the school's mission. As a result of the five to six year cycle of accreditation visits, and the phasing in of the standards changes, schools are undoubtedly at various places along the curve of fully embracing assessment of learning as an integrated part of curriculum development.

A critical requirement of the new ALS is that schools must now "specify learning goals and demonstrate achievement of goals for key general, management-specific, and/or appropriate discipline-specific knowledge and skills that its students achieve in each undergraduate degree program." (AACSB-International, 2010, pg. 71). For example, one learning goal may be that "students will be able to function effectively in teams". To achieve this goal one or more core business courses may use team-based assignments to measure team effectiveness and individual student contributions to team performance. Importantly, when assessments demonstrate deficiencies in student achievement of learning goals (i.e., poor performance on the team-based assessments), the school must institute efforts to eliminate these deficiencies (AACSB-International, 2010, pg. 72). Once the learning goals are set, a school may decide that an individual core course will address one or more of the knowledge and skills goals. Therefore, at least one of the learning goals for a core course should be congruent with one of the learning goals of the program. If this is not the case it raises the question of whether or not such a course should be required of all students in the program.

The revised accreditation standards do not specify the assessment methods that must be implemented. Either course-embedded measurement or stand-alone testing may be used, but schools are encouraged to choose, create, and innovate learning measures that fit with the goals of the degree programs, pedagogies in use, and schools' circumstances (AACSB-International, 2010, pg. 63).

2.2 Implications for Accreditation

In order to meet the AACSB accreditation standards a school must have a published mission statement (AACSB 2010, Standard 1, pg 16) and learning goals for each of its programs (AACSB-International, 2010, Standard 1, pg 16). The program learning goals must be derived from, or be consonant with, the mission. The mission statement indicates the intentions of the school, while the learning goals indicate

how the programs align with the mission (AACSB-International, 2010, pg. 59). One of the key AACSB requirements for programs states that "for each undergraduate degree program the school demonstrates that students meet the learning goals." The assessment serves to demonstrate that the program goals are achieved in the core courses. Figure 1 depicts how the school's mission relates to the assessment. The standards allow for multiple approaches to meet the Assurance of Learning Standards (AACSB-International, 2010, pp. 63-65). If course-embedded measures are used, there must be specific learning objectives for the course. Learning objectives at the course level are more detailed than the learning goals for the program. If a school is making the case for using course-embedded measures for assessment of learning, at least one of the learning objectives of the course must be congruent with one of the program goals that the course will achieve. The methods used to measure outcomes are not prescribed and may include projects, papers, or tests, among others. Even if course-embedded measures are not used, the relationships of mission, to learning goals, to course learning objectives remain the same. The learning goals are derived from the mission and the course learning objectives should be consonant with the learning goals.

3. COMPLYING WITH THE NEW REQUIREMENTS

3.1 An Implementation Process

As described earlier, the mission statement of a school drives its learning goals which, in turn, drive the specific learning objectives of the courses in the core curriculum. At the authors' institution, the business school's mission statement states: "… [We] will deliver high quality undergraduate and graduate business programs that prepare our students for responsible careers. We will enhance the intellectual and economic vitality of our city, the region, and the broader business community through our academic programs, research, and community outreach activities." This type of broad statement of mission is fairly typical of business schools and is often supported by more specific goals and values described in a school's vision statement and/or strategic plan. At the authors' institution, these specific values include:

- **Entrepreneurial perspective**, "characterized by a capacity for nimble, creative thinking, a willingness to take risks, a capacity to manage those risks, and a strategic perspective in making decisions."
- **Global perspective**, presenting "functional area problems and broad strategic issues with the perspective of a globally competitive enterprise."
- **Sensitivity to the ethical context of business decisions**, addressing "the ethical context in which business decisions are made" and managing business relationships with integrity.
- **Respect for the value of diversity**, understanding that "diversity creates opportunities, enriches organizations, and enhances the learning process."
- **Critical thinking skills**, developing "skills that permit [students] to logically approach and solve problems and to recognize opportunities."
- **Technology skills**, "using and managing technology for strategic advantage within the organization."

In support of the school's mission, the school should provide high level learning goals for each degree program. At the authors' institution, the Bachelor of Science in Business Administration degree program has the following eight learning goals for its graduates:

- Be competent in their discipline.
- Be problem solvers.
- Have an awareness of ethical issues.
- Be effective communicators.
- Be knowledgeable of business disciplines.
- Be competent with technology.
- Have awareness of the global business environment.
- Appreciate diversity.

The school must demonstrate that the core courses in the program deliver on all but the first learning goal. As a consequence, each goal is mapped onto one or more core curriculum courses designed to deliver the knowledge and develop the skills that achieve the goal. At our institution, the learning goal associated with "technology competence" is largely delivered by two core courses in Information Systems. Between these two courses, students are expected to: (1) acquire the skills to develop and use spreadsheets and database software to solve simple business problems, (2) understand the technology infrastructure that supports organizational decision-making, and (3) understand the strategic impact of IS. The focus in this paper is on the

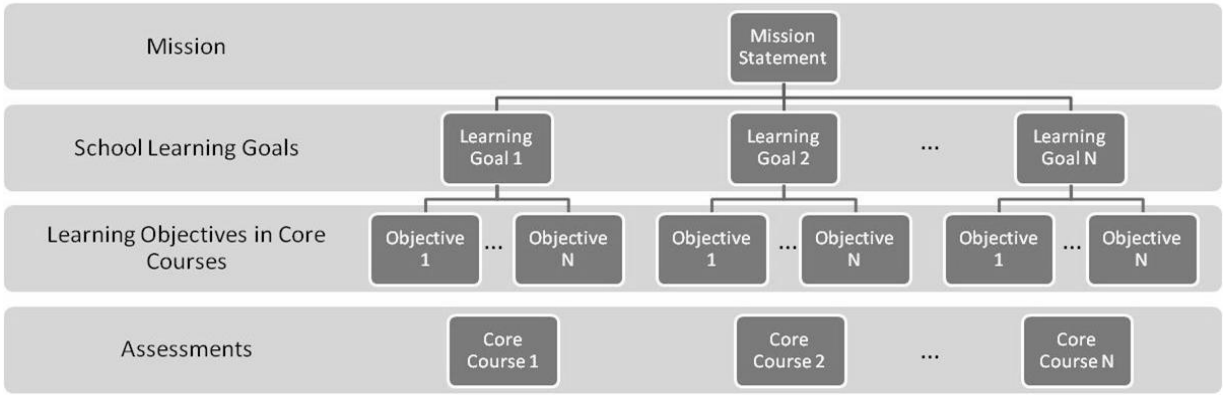

Figure 1: Relationship between a School's mission and Assessment

second of these courses, titled *Computer Information Systems*, in which students are exposed to a diverse range of MIS topics and learn to use advanced features in Microsoft Excel and Microsoft Access to solve business problems. This course is typically taken by students in the first semester of the junior year.

In this course, we have identified eight course-level learning objectives that support the overall learning goal of technology competence. These learning objectives fall into three major categories: Software Application Skills, Technology Infrastructure Knowledge, and Information Systems Strategy Knowledge. Figure 2 presents the eight course learning objectives and the relative importance for each.

4. COURSE CONTENT, OUTCOME MEASUREMENT AND IMPROVEMENT

Once the learning objectives in Figure 2 were developed, an IS faculty committee (comprised of individuals who had recently taught one of the core courses) was formed to ensure that the course (including lecture topics, assignments, projects, and tests) would address each of the learning objectives. This committee considered content, reading material, assignments, and delivery mechanisms and made suggestions for changes. The discussion here, however, is centered on assessment.

4.1 The Assessment Strategies, Measures, and Criteria

The committee considered a wide range of assessment methods, including indirect assessment, assignment assessment and course assessment,[4] to measure and to assess the learning objectives listed in Figure 2. A program committee also considered program assessment in lieu of assessment of individual courses. The committee decided on direct assessment using objective measures early in the process. Direct assessment methods evaluate learning at the source. The direct assessment method measures student progress toward specific learning objectives at the end of each teaching segment. Tests are a common direct assessment measure (White, et al., 2008).

The committee settled on the direct assessment method for several reasons. First, an important goal of the assessment process is to assess student achievement of specific IS skills and knowledge that lay the foundation for student success in their upper division business courses and business careers. Direct assessment techniques are well-suited for assessing student achievement of specific learning objectives (White, et al., 2008).

Second, direct assessment using embedded test questions can easily accommodate revisions to course content. Such flexibility is a particularly important for any IS core course since rapid changes in the software applications and technology infrastructure used in organizations require similarly rapid changes in course content. By their nature, IS core courses require frequent revisions and updates to content. Direct assessment provides faculty with the flexibility necessary to deal with such revisions to course content.

Finally, the direct assessment method is relatively efficient. That is, since the learning objective assessment questions are already embedded in traditional course assessments, formal assessment of the student learning outcomes does not require that time and resources be taken away from course content or student contact hours. Some other assessment methods require the use of more faculty and student time and resources to administer. For example, an alternative method to direct assessment using embedded questions may be to administer an assessment pre-test at the beginning of the course and an assessment post-test at the end of the course. This method is commonly used in assessing student progress in elementary and middle schools to determine what students have learned (Rohrbeck, et al., 2003). However, this method often requires faculty to spend at least an hour of class time at the beginning of the semester to administer the pre-test and at least an hour of time at the end of the course to administer a post-test. In addition, unless these tests are part of their course grade there is often little incentive for students to take the tests seriously. More importantly, AACSB is interested in assessing what students know (outcomes) by the end of the course, not necessarily how much more they know at the end of the course than they did at the beginning of the course.

After deciding to embed assessment questions across the tests, the committee had to determine the format of the assessment questions. Test questions may take many forms ranging from closed response formats (e.g., True/False, multiple choice, fill-in-the-blank) that have objective, "correct" solutions to open response formats (e.g., short

Software Application Skills		**25%**
1	Ability to learn and use Windows, business suite software (MS Excel and MS Access), and e-mail	15%
2	Ability to access the Internet/Web and use its search features to locate/extract data and information	5%
3	Ability to use information systems to store and to retrieve business data	5%
Technology Infrastructure Knowledge		**40%**
4	Knowledge of how systems theory may be used to describe data and information needs	5%
5	Knowledge of role of IT in supporting/improving the processes of functional areas of business	15%
6	Knowledge of the role of IT in decision processes	20%
Information Systems Strategy Knowledge		**35%**
7	Knowledge of how IT may be used for competitive advantage	20%
8	Knowledge of how IT may be used in a globally competitive environment	15%
		100%

Figure 2: Computer Information Systems Learning Objectives

answer and essay questions) that are more subjective and require detailed grading rubrics. The choice of question format depends, once again, on the characteristics of the course. For example, if a course objective is to improve written communication or argumentation skills, open response questions may be necessary.

A critical goal of the IS core course is to provide all business students with an overview of IS technologies, the strategic role of IS in business, and a high-level understanding of how information systems support and integrate the different functional areas of an organization. In other words, much of the course is focused on providing students with broad (not deep) IS knowledge, including an understanding of high-level concepts and terminology.

Each semester the school offers eight to ten sections of the IS core course, each with approximately 35 students. Each semester between four and seven faculty members have taught sections. The teaching faculty is quite diverse, ranging from part-time, adjunct instructors to tenured, full professors. In addition, there is significant turnover in the teaching faculty from semester to semester.

The committee decided to embed 47 multiple choice and True/False assessment questions in the tests administered during the course. Given the course's focus on breadth rather than depth, the large number of course sections, the large size of each section, the number and diversity of faculty teaching the sections, and the frequent turnover in faculty from semester to semester, the committee determined that multiple choice and True/False formats are best suited for the assessments. This format allows the faculty to effectively test breadth of knowledge. In addition, it provides consistency and objectivity in grading (and thus enables a more valid comparison of students progress) across course sections, across faculty, and across semesters. As such, the multiple choice and True/False formats reduce the time, effort, and resources required to administer and to evaluate the assessment questions. More subjective assessment techniques, such as open response essay questions that require more complicated grading rubrics, may be more appropriate for assessing upper division IS courses – that is, courses with fewer class sections, smaller class sizes, fewer supporting faculty, and a focus on deep, experiential knowledge on a specific topic (e.g., databases or systems analysis and design).[5]

Based on the considerations discussed above, each faculty member teaching a section embeds the 47 common questions across three to five in-class tests (faculty can choose how many times they want to test students) that assess students' mastery of software application skills (SAS), technology infrastructure knowledge (TIK), and IS strategy knowledge (ISSK). On average, embedded assessment questions account for about 15% of the questions on tests and take less than 15% of student time on a test.[6] Examples of assessment questions for each of the three learning outcome areas are presented in the Appendix.

It is worth noting that convincing IS core course faculty to participate fully in the assessment activities may sometimes be a difficult task. Without a well-established culture of assessment within the college and department, obtaining faculty buy-in may present real challenges. For example, getting agreement on which common questions to include on exams for direct assessment requires that faculty members give up a certain amount of control over their exams. The authors recognize the importance of striking an appropriate balance between the flexibility that individual faculty members should have over their courses and the need for consistency in assessment activities. Core courses in the business curriculum, however, must achieve the required learning objectives not only for assessment purposes but also because of the dependencies that later courses have on these elements.

In an effort to strike the proper balance, the faculty at the authors' college has agreed that while a faculty member is free to craft his or her own approach to teaching a particular course, the course learning objectives are the responsibility of the program faculty. Faculty members may not omit any learning objectives unless the program faculty agrees. This practice is outlined directly in the college's personnel document. In addition, at the authors' institution, assessment practices are considered an important part of each faculty member's teaching workload and are a part of the annual report produced for each faculty member's evaluation. If a faculty member were to ignore their assessment responsibilities in the authors' college, they could be significantly penalized in the merit-based component of their pay raise. This, too, is directly outlined in college's personnel document. These well-established practices have helped create a culture of assessment that eases the gathering of the necessary data for assessment activities.

4.2 Using Assessment Results

Our faculty has set 70% as a performance target for each of the assessment questions, i.e., we expect at least 70% of the students to correctly answer each assessment question. At the end of each semester, performance data for each of the 47 questions, for each section is obtained. This data is aggregated and analyzed to identify deficiencies in student achievement or deficiencies in assessment questions. Section by section data are also analyzed to identify faculty issues that may need to be addressed.[7]

Table 1 shows a typical summary of the assessment results by major category. Specifically, Table 1 displays the percentage of students that correctly answered the set of questions in each knowledge/skill area.

Table 2 shows a portion of a detailed presentation of the assessment results by question for each section. That is, for each assessment question, Table 2 shows the percentage of students in each course section that answered the question correctly.

A plan for improvement is a critical requirement of AACSB Assessment of Learning Standards. Faculty in each course is required to use assessment results to propose improvements to the course. The sample data presented above are actually based on our assessments during the Fall 2009 semester. When presented in this format, it is easy to identify potential problems in major categories and specific knowledge or skills addressed by individual questions. For example, from Table 1, it appears that students have a better grasp of IS strategic knowledge than either technology infrastructure or software application skills. Similarly, for each question that does not meet the assessment target (at least 70% correct), the faculty discusses the question,

	TIK (20 Questions)	ISSK (13 Questions)	SAS (14 Questions)	Total (47 Questions)
% Correct	74.9%	80.9%	74.1%	76.3%

Table 1. Summary Results: Percentage Correct by Learning Objective Category

Q. #	Knowledge / Skill Area	22 students	79 students	33 students	32 students	30 students	35 students	27 students	Weighted Average
		Sect. 1	**Sect. 2**	**Sect. 3**	**Sect. 4**	**Sect. 5**	**Sect. 6**	**Sect. 7**	
1	Strategic	77%	58%	100%	79%	69%	84%	92%	**76%**
2	Strategic	96%	91%	97%	97%	96%	94%	96%	**95%**
3	Infrastructure	45%	68%	97%	67%	61%	35%	68%	**64%**
4	Application	91%	94%	67%	82%	93%	94%	96%	**89%**
5	Application	23%	28%	21%	18%	29%	24%	20%	**24%**
…	…	…	…	…	…	…	…	…	**…**
47	Application	91%	100%	64%	91%	82%	76%	100%	**88%**
Average		**75%**	**82%**	**70%**	**76%**	**73%**	**71%**	**77%**	**76%**

Table 2. Detailed Results: Percentage Correct by Question and Section

identifies potential sources of the deficiency in student achievement, and tries to find ways to improve outcomes. For example, in Table 2, student performance on questions 3 and 5 do not meet the performance target. In some instances, the solution may simply be to rephrase the question; in others, it may require additional work on a specific topic or revisions to application homework assignments for students. In other cases, though, the course content may need to be changed to address a learning gap.

As an example, our Fall 2009 assessment indicated that a question requiring the use of the VLOOKUP function in Microsoft Excel was answered correctly by just 43% of students. After some discussion, faculty concluded that the VLOOKUP function is a difficult function for students to learn to use in a problem-solving context. As part of our plan for improvement, faculty decided to take three immediate actions. First, they decided to provide additional VLOOKUP questions on the sample tests and MS Excel Homework Assignments. Second, they decided to provide additional material related to the function to those running the course test review sessions. Third, for future semesters they decided to develop and include additional assessment questions requiring the use of the VLOOKUP function; these additional assessment questions were designed to better assess student learning problems with this function and to uncover patterns of mistakes made by students when using the function. In addition to these actions, faculty members planned to help improve student comprehension of this data function by revisiting their in-class coverage of the function and the supplemental materials made available to students in the Course Management System (CMS).

One problem in interpreting results such as those presented in Table 2 is that it is difficult to pinpoint the cause of subpar student performance on individual questions. For example, our analysis has revealed that there is a significant performance difference between questions embedded on the first test and questions embedded on later tests. After obtaining feedback (using direct and anonymous methods) from students, we believe that lower performance on the first test may be due, at least partially, to students' lack of familiarity with the test format, structure, and expectations. For example, the Fall 2009 data show that the average grade for questions embedded in the first test was 70.5% while the average grade for questions embedded on later tests was 79.2%; this is true even though the difficulty of the course content tends to increase as the semester progresses. This suggests that students may perform better as they become more familiar and comfortable with the test format, structure, and expectations. This is consistent with the assessment data and is supported by informal feedback collected from students via mid-course feedback surveys.

Other possible causes of sub-standard performance include teaching approaches and poor assessment questions. Statistical analysis could help separate problems with teaching approaches from problems with the assessment questions. Such analyses would evaluate the reliability and validity of individual assessment test questions and help determine if the problems are with the quality of the assessment questions (e.g., their wording, grammar, lack of clarity) or with teaching quality and student comprehension. In such analysis, a student's overall performance is compared to her performance on a question. On well crafted questions, students that do well overall, will tend to perform well on the question. On poorly crafted questions, good and bad students are equally likely to fare poorly. To this point, we have not performed such analysis (often referred to as test item analysis) for financial reasons. The course management system in place at the authors' institution does not directly perform this type of test item analysis and the system's data export of test results would require significant editing to make it amenable to such analysis.

In addition to performance assessment of individual questions and major learning objective categories, we also compare performance over time to determine whether our

implementation of improvement plans is successful. For example, a comparison of results from our Fall 2008 assessment to the results from our Fall 2009 assessment led to the following observations:

- Students' performance in the area of Technology Infrastructure Knowledge improved from 65.1% in Fall 2008 to 74.9% in Fall 2009.
- Students' performance in the area of Software Application Skills improved from 63.1% in Fall 2008 to 74.1% in Fall 2009.
- Students' performance in the area of IS Strategic Knowledge improved from 80.5% in Fall 2008 to 80.9% in Fall 2009.
- Overall results improved from 68.7% in Fall 2008 to 76.3% in Fall 2009.

By comparing results over time, the impact of instructional and broader curriculum changes may be captured. In the above comparison, for example, a major change in the design of a prerequisite course had been implemented. The significant improvements in year over year performance suggest that the redesign was effective, at least to some extent.

5. FACULTY FLEXIBILITY

The approach described here allows faculty members some content flexibility and considerable delivery flexibility. Instructors may include "favorite" topics and skills that are not part of the assessment and have complete flexibility in how they deliver the course. Each faculty member can decide on the sequence of, and the time devoted to, different topics and skills and can choose to assess students on a schedule of their choosing. For example, the embedded questions are spread over anywhere from three to five tests because faculty choose to test students anywhere from three to five times in a semester. In addition, student assignments, homework, projects, etc., also vary by section. However, each instructor is required to include the designated assessment questions from the assessment pool on a test that includes the relevant topics.

6. DISCUSSION

The discourse on teaching in the top IS research journals has primarily centered on course content ((Silver, et al., 1995); (Dhar and Sundararajan, 2007)). This focus on content may be at least partially due to the rapid technological changes with which IS faculty must grapple. Indeed, rapid changes in content, and therefore learning outcomes, may be inevitable in our discipline. However, since the new AACSB ALS requirements make assessment mandatory, IS faculty must develop efficient and effective ways to assess student learning outcomes in this dynamic environment. We can no longer use technology changes as an excuse to keep from examining what students know about IS after taking our courses. Some argue that our discipline has an "identity crisis" ((Silver, et al., 1995); (Dhar and Sundararajan, 2007); (Robey, 2003); (Benbasat and Zmud, 2003); (Davidson, 2011)); this makes assessment more challenging because it is difficult to determine what and how we should assess. We may have to accept the fact that we will have to modify what and how we assess more often than do our colleagues in other business disciplines.

Although the focus of this paper has been on AACSB assessment, we acknowledge that AACSB is not the only body demanding assessment of what students learn. Increasingly, state legislators are making similar demands, as are other certifying bodies (e.g., SACS (Southern Association of Colleges and Schools)). As faculty design and develop assessment activities, they should consider that AACSB assessment may be able to satisfy other stakeholders demanding assessment, or assessment efforts to meet demands from other stakeholders may be useful in efforts to meet AACSB assessment requirements.

While this paper discusses what faculty may do to meet AACSB ALS requirements for an IS core course, it is important to note that AACSB also provides resources to help schools meet its assessment requirements. For example, AACSB periodically offers assessment workshops – typically in conjunction with its annual conference. These workshops were extremely valuable in our assessment efforts. Many of the individuals (including one of the authors of this paper) who were responsible for overseeing our assessment efforts attended such assessment workshops. AACSB also has an online repository of assessment efforts, but access to the repository is only available to those who have attended one of their workshops.

Using formal assessments of learning, as described in this paper, to improve course outcomes can, over time, pose problems because students may reach a learning plateau (e.g., 90% of the students master the material) or all students may demonstrate perfect knowledge of the material. In the IS area, however, we seldom have to contend with this problem. Technology changes too fast to allow us to use the same assessment questions over a long period of time – long enough to reach a plateau.

7. SUMMARY & CONCLUSION

AACSB accreditation is a much sought designation by business schools. Beginning in 2003, AACSB changed their assessment of programs to assess outputs (i.e., what students have learned) from an assessment of inputs (i.e., what students were taught). This requires that programs put into place assessment programs that demonstrate what students have learned. In addition, schools must use assessment results to improve their programs.

In this paper we describe the process used to determine how to assess part of our undergraduate program, specifically the technology skills component. Specifically, we described the use of objective measures to assess learning with the express intent of meeting AACSB requirements with as little effort and imposition on faculty flexibility. The approach our school chose required that we assess student learning in the two IS core courses in the program. Here we describe the process used to assess student learning in one of those required IS courses and how the results of the assessment are used to improve learning. The assessment described in the paper uses objective measures, but subjective measures can also be used. In addition, we describe how the IS course assessment ties in to learning assessment of the undergraduate program as a whole. It is

our hope that this paper may help other schools with their assessment initiatives. Perhaps our paper can provide the impetus for a community of interest among those seeking to improve assessment in IS courses and programs. Through shared experience, best practices in assessment may be developed.

8. ENDNOTES

1 Unless stated otherwise, all references to standards in this paper are to the 2010 standards (AACSB-International, 2010)

2 For over 15 years, one of the authors has been on AACSB teams that visit and evaluate schools applying for accreditation.

3 The purpose of this paper is not to identify and evaluate alternative assessment methods and approaches, but instead to present a specific example of an efficient and effective assessment method used in an IS core course. It is efficient in the use of faculty resources devoted to meeting the new ALS requirements. It is effective in that we measure outcomes and use the results to improve student learning. As a consequence, the paper should help those attempting to attain and retain accreditation. It may be less helpful for those already engaged in these assessment processes.

4 See White et al. (2008) for a concise explanation of different types of assessment.

5 It should be noted that in IS courses that are not in the core (i.e., course taken by students majoring in IS), we use a variety of assessment methods, including indirect assessment and assignment assessment, with subjective measures.

6 It is important to note that the 47 assessment questions represent a small portion of the course tests and an even smaller portion of overall student assessment in the course. In addition to the assessment questions included in AACSB reports, each faculty member uses additional questions to assess student performance. For example, on tests most faculty members include open-response questions that require students to demonstrate depth of knowledge in specific content areas. The additional questions do not have to be the same across sections and provide faculty with a great deal of flexibility in how they teach and assess student performance. In addition, the faculty use approaches other than tests, including homework assignments, projects, and labs, to assess student performance (separate from the AACSB requirements).

7 Currently, the process of aggregating the data is somewhat cumbersome, in large measure due to limitations of the institution's Course Management System (CMS). Each instructor must create a statistics report for each exam that includes embedded assessment questions. Results for the relevant questions are then entered into a spreadsheet for the course section, noting the number of students that chose each correct and incorrect response. The report generated by the CMS provides these counts, per question. At the end of the semester, the assessment lead faculty member takes these spreadsheet files and creates an overall summary of the student choices. While the CMS does support export of the raw data from each exam, the format does not easily lend itself to more detailed test item analysis.

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APPENDIX
Sample Assessment Questions
Fall 2009

Sample SAS Question 1

(Excel) Review the accompanying worksheet image and then answer the question below. The first row and column in the worksheet refer to Excel column and row labels, respectively.

	A	B	C	D
1				
2		Group Table		
3		Age	Through	Group
4		2	3	Jaguar
5		4	5	Dolphins
6		6	9	Tigers
7		10	12	Eagles
8		13		None
9				
10				
11		Child	Age	Group
12		Steven	8	xxx
13		Sara	7	xxx
14		Cayli	3	xxx
15		Brett	2	xxx
16		Scott	11	xxx
17		Ashley	15	xxx
18		Clair	8	xxx
19		Patrick	6	xxx
20		James	10	xxx

At the Local Resort Camp, each child is assigned to a specific group based on age according to the Group Table shown in the worksheet above. For example, children ages 2 or 3 years old are assigned to the Jaguar Group; children who are at least 6 years but no older than 9 years old are assigned to the Tigers group. However, teenagers (i.e., children 13 years and older) are not assigned to a group; instead, they are assigned to "None".

Which of the following formulas, when entered into cell D12, will determine the correct group to assign each child? (**Note:** Your formula will need to work properly when copied down though cell D20.)

A. =VLOOKUP($C12, $B$4:$D$8, 3, FALSE)
B. =IF($C$12>=13, "None", VLOOKUP($C$12, $B$4:$D$8, 3))
C. =IF($C12<13, VLOOKUP($C12, $B$4:$D$8, 3, FALSE), "None")
D. =VLOOKUP($C$12, $B$4:$D$8, 3, TRUE)
E. =VLOOKUP($C12, $B$4:$D$8, 3)

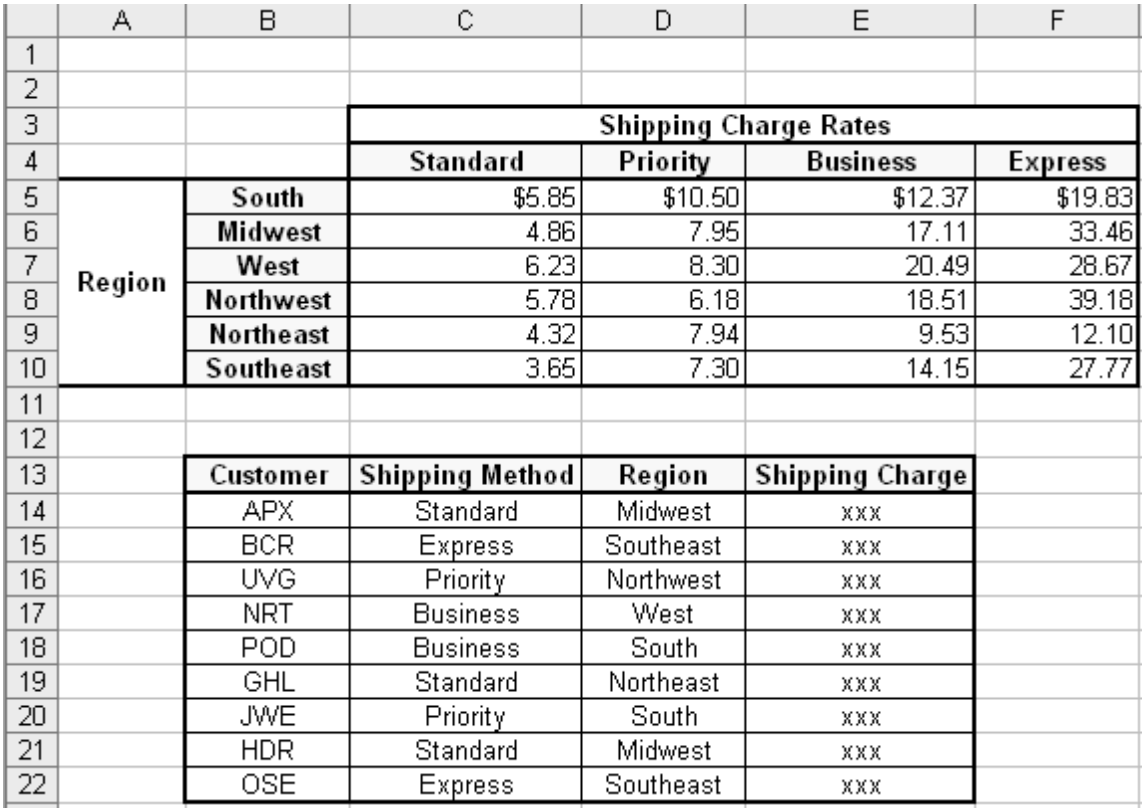
Sample SAS Question 2

(Excel) A customer applies for a loan and the bank reviewing the application uses the following rules: If the applicant's FICO score (entered in cell A5) is less than 650, then the application is rejected. However, if the applicant's FICO score is greater than 750, then the applicant is approved and the interest rate is set at 5.5%. Otherwise, the interest rate is set at 6.5%. Which of the following formulas will give the correct answer?

A. =IF(A5 < 650, "Rejected", IF(A5 > 650, 6.5%, IF(A5 > 750, 5.5%)))
B. =IF(A5 <= 650, "Rejected", IF(A5 >= 650, 6.5%, IF(A5 > 750, 5.5%, "")))
C. =IF(A5 < 650, "Rejected", IF(A5 >= 650, 6.5%, IF(A5 >= 750, 5.5%, "")))
D. =IF(A5 >= 650, 6.5%, IF(A5 > 750, 5.5%, "Rejected"))
E. =IF(A5 < 650, "Rejected", IF(A5 > 750, 5.5%, 6.5%))

Sample SAS Question 3

(Excel) Review the accompanying worksheet image and then answer the question below. The first row and column in the worksheet refer to Excel column and row labels, respectively.



	A	B	C	D	E	F
1						
2						
3			Shipping Charge Rates			
4			Standard	Priority	Business	Express
5	Region	South	$5.85	$10.50	$12.37	$19.83
6		Midwest	4.86	7.95	17.11	33.46
7		West	6.23	8.30	20.49	28.67
8		Northwest	5.78	6.18	18.51	39.18
9		Northeast	4.32	7.94	9.53	12.10
10		Southeast	3.65	7.30	14.15	27.77
11						
12						
13		Customer	Shipping Method	Region	Shipping Charge	
14		APX	Standard	Midwest	xxx	
15		BCR	Express	Southeast	xxx	
16		UVG	Priority	Northwest	xxx	
17		NRT	Business	West	xxx	
18		POD	Business	South	xxx	
19		GHL	Standard	Northeast	xxx	
20		JWE	Priority	South	xxx	
21		HDR	Standard	Midwest	xxx	
22		OSE	Express	Southeast	xxx	

The worksheet above contains a table with shipping rates charged to customers based upon the shipping service (Standard, Priority, Business, or Express) desired and region (South, Midwest, etc.).

What formula should be entered into cell E14 to determine the correct shipping charge for customer APX? (**Note:** Your formula will need to work properly when copied down though cell E22.)

A. =VLOOKUP(D14,C5:F10,MATCH(C14,C4:F4,FALSE))
B. =VLOOKUP(D14,C5:F10,MATCH(C14,C4:F4,FALSE),FALSE)
C. =INDEX($C$5:$F$10,MATCH(D14,$B$5:$B$10,FALSE),MATCH(C14,$C$4:$F$4,FALSE))
D. =INDEX(C5:F10,MATCH(D14,$B$5:$B$10,TRUE),MATCH(C14,C4:$F$4,FALSE))
E. =VLOOKUP(D13,B5:F10,2)

Sample TIK Question 1

Which of the following information systems components does Information Technology focus on?

A. Data, Procedures, and People
B. Hardware, Software, and Data
C. Procedures and People
D. Data and Security
E. Hardware, Software, Data, Procedures, and People

Sample TIK Question 2

What is the name of an information system that ties together different functional areas (e.g., accounting, finance, and marketing) of an organization and automates the communication among these functional areas?

A. Transaction Processing Systems (TPS)
B. Enterprise Resource Planning (ERP) Systems
C. Customer Relationship Management (CRM) Systems
D. Functional Area Information Systems (FAIS)
E. Supply Chain Management (SCM) Systems

Sample TIK Question 3

In a relational database, what kind of key is defined as a shared field that links or joins two tables?

A. Foreign key
B. Primary key
C. Table key
D. Compound key
E. None of the answers provided is correct

Sample TIK Question 4

Organizations should secure their sensitive data by storing it in _____ form.

A. encrypted
B. heuristic
C. compressed
D. standardized
E. holographic

Sample ISSK Question 1

Many companies, such as Adobe, give their multi-media players away for free over the internet. Their hope is to get everyone to use their players and therefore encourage companies to purchase their content development tools which create the video and audio content that can be read by their players. This is an example of an effort to gain competitive advantage by _____.

A. Reducing costs
B. Creating new products or services
C. Differentiating your products or services
D. Enhancing your product or services
E. Locking in buyers or suppliers

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