



Assessing Students' Learning of Internal Controls: Closing the Loop

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1. Introduction

Accreditation bodies are demanding more tangible evidence demonstrating conclusively that accounting educators are engaging in meaningful assessment evaluations. A major theme in accounting education is how to engage educators and other stakeholders in the assessment procedure. This paper synthesizes and integrates several key concepts relevant to the assessment process. First, it illustrates a course of action in which an accounting department was able to actively involve the professional community, an advisory council, in the role of ranking learning competencies. The top learning competency identified by the advisory council was to understand internal controls and how controls can ensure the accuracy and integrity of financial data with respect to the safeguarding of business assets. Second, based on this top learning competency a course-embedded assessment tool was developed for an auditing course. This tool, which was an essay question on the final exam, was used to evaluate whether students' answers met or exceeded expectations with regard to understanding internal controls. In a subsequent auditing course we "closed the loop" in the assessment process by adding lecture material to address the learning objective.

Course-embedded assessment is the collection of data, typically by exams or other graded projects, within the regular classroom environment. As Ammons and Mills (2005) explain, course-embedded assessment offers several benefits, the most notable being that students are motivated to respond seriously to the assessment tool since it can impact their grades. Therefore, the incorporation of course-embedded assessment via an examination question enhances the internal validity of the current study.

2. Methodology and Data Collection

All business majors should develop competencies in the areas of written and oral communication, analytical skills, and self-management. Students also need to obtain a global and environmental awareness and conduct their professional lives in an ethical and socially responsible manner. Table 1 lists undergraduate learning goals as approved by the faculty at our College. The College is an AACSB-accredited business school located in the Southwest offering undergraduate and MBA business degrees.¹

¹ The College does not offer a PhD. program in business.

Table 1: Undergraduate Learning Goals

The undergraduate experience in the College of Business Administration prepares graduates for professional and managerial careers in business organizations. It also provides a foundation for continuing professional or graduate education. Each graduate is competent in the general areas of analytical skills, communication, ethics & social responsibility, and global & environmental awareness. In addition, graduates have core competencies in business and specific skills in one or more business fields.

Communication

Graduates can communicate effectively in written and oral formats for a variety of purposes, situations and audiences. Additionally, students can communicate effectively as both individuals and as part of a group presentation.

Analytical Skills

Graduates can apply problem-solving processes, information technologies, systems approaches and both qualitative and quantitative analysis to solve organizational problems.

Ethics and Social Responsibility

Graduates can demonstrate the ability to identify ethical dilemmas and be able to recognize and evaluate alternative courses of action.

Global and Environmental Awareness

Graduates are able to act with understanding and sensitivity to cultural diversity and be knowledgeable of global communities and environments.

Core Competencies in Business

Graduates will have knowledge, skills and abilities developed in the core curriculum.

Business Fields

Graduates have competency in one or more fields (e.g. Accounting, Computer Information Systems, Economics, Finance, Management, and Marketing) beyond the knowledge, skills and abilities developed in the core curriculum.

Source: Undergraduate Learning Goals approved by the faculty of the College of Business Administration.

The College of Business Administration’s Curriculum Committee developed rubrics and other measurement tools to be used in capstone business courses to assess students’ performances in relation to these undergraduate learning goals. Clearly, these goals are consistent with the AICPA’s (1999) *Core Competency Framework for Entry into the Accounting Profession*. Moreover, the accounting department faculty identified ten additional functional competencies that an accounting major is expected to have when completing the program beyond these goals. These ten competencies are listed in Table 2 in no specific order.²

² Ammons and Mills (2005, page 5) argue that instead of objectives that use verbs like “understand” or “appreciate,” objectives will provide a better basis for assessment if they use observable descriptions of learning outcomes with action verbs like “calculate,” “categorize,” “compare,” or “construct.”

Table 2: Ten Things That an Accounting Major Should Know

1. Prepare financial statements that are consistent in form & content with current professional standards
2. Understand GAAP
3. Apply accounting concepts & principles in practice
4. Use technology appropriately to research and analyze and/or solve accounting problems
5. Understand internal controls & how controls can ensure the accuracy & integrity of financial data & safeguarding of business assets
6. Analyze systems & identify the functions for each technology component in a system; design & implement appropriate control systems for each component
7. Understand the role auditing plays in promoting the free flow of reliable information
8. Comprehend the content, structure, & meaning of reporting for internal operations, & apply the concepts to create accounting reports & design management planning & control systems
9. Understand the role of taxation in business & personal decision-making processes
10. Understand current accounting theory & the approaches to its development

At the annual spring accounting advisory meeting participants engaged in an exercise to identify the importance of the aforementioned ten competencies. Each competency was written on flip charts which were randomly distributed around the meeting room. Ten professionals, seven faculty members, and one student were each given four “P” dots and 4 “I” dots.³ The “P” represented public accounting and “I” represented industry. The participants then went around the room and placed their allotment of dots on what they considered to be the most important competencies. Table 3 shows the results.

The accounting advisory council members found it to be an innovative and inspiring way to involve panel members in the assessment process. Elicitation of professionals’ views with respect to rank ordering the ten competencies provided the accounting faculty with a unique perspective on their perceived importance in the business community. In addition, this procedure touched on some important broad principles related to assessment. For example, as Apostolou (1999, page 179) states:

- Assessment fosters wider improvement when representatives from across the educational community are involved, *and*
- Assessment makes a difference when it begins with issues of use and illuminates questions that people really care about

From Table 3 it is easy to ascertain that understanding internal controls was the learning competency that emerged on top. With the leading learning competency identified, a final exam essay question was developed. As shown in Table 4 this essay question contained three parts.⁴

³ The professionals consisted of two audit partners (“Big 4” and a national CPA firm), two audit managers (one “Big 4” and the other from the state’s Auditor General office), one attorney, one sole practitioner, one chief financial officer, one CPA executive from the State’s Society of CPAs, one internal auditor director, and one controller.

⁴ Parts II & III of the essay question were adapted and modified from Messier, Glover & Prawitt (2006).

Table 3: Evaluation of Functional Competencies

(Each person had 4 "P" dots & 4 "I" dots)	AAC Members (n=10)		Faculty (n=7)		Student (n=1)		
	dark blue dots		yellow dots		light blue dots		Total
Functional Competency	Public	Industry	Public	Industry	Public	Industry	Dots
Understand internal controls & how controls can ensure the accuracy & integrity of financial data & safeguarding of business assets	9	8	3	4	1		25
Understand GAAP	6	4	6	3			19
Prepare financial statements that are consistent in form & content with current professional standards	4	4	5	3	1	1	18
Use technology appropriately to research and analyze and/or solve accounting problems	6	3	3	1	1	1	15
Comprehend the content, structure, & meaning of reporting for internal operations, & apply the concepts to create accounting reports & design management planning & control systems	1	8		5			14
Analyze systems & identify the functions for each technology component in a system; design & implement appropriate control systems for each component		6	1	5		1	13
Understand the role auditing plays in promoting the free flow of reliable information	6	1	4		1		12
Apply accounting concepts & principles in practice	4	4	3	1			12
Understand the role of taxation in business & personal decision-making processes		2	1	5		1	9
Understand current accounting theory & the approaches to its development			2	1			3
	36	40	28	28	4	4	

Table 4: Essay Question – Internal Controls

Questions:

Part I: Define internal control and the objectives of a system of internal controls

Part II: List the key segregation of duties in the expenditures cycle – the request, ordering, and payment for merchandise inventory

Part III: What errors or fraud can occur if the duties in the expenditure cycle are not segregated?

Suggested Answers:

Part I: Internal control is the set of policies and procedures developed to ensure the safeguarding of an entity's assets, the reliability of its accounting records, and the accomplishment of overall company objectives. The objectives of a system of internal controls are to provide reasonable assurance regarding

- Reliability of financial reporting
- Effectiveness and efficiency of operations
- Compliance with applicable laws and regulations

Part II:

- The purchasing function should be segregated from the requisitioning and receiving functions
- The invoice-processing function should be segregated from the accounts payable function
- The disbursement function should be segregated from the accounts payable function
- The accounts payable function should be segregated from the general ledger function

Part III:

- Theft of goods
- Possible payment for unauthorized purchases
- Theft of cash
- Overpayment for goods and services
- A defalcation that would normally be detected by reconciling subsidiary records with the general ledger control account

Control Group

In order to establish a baseline of student understanding of internal controls and determine if an improvement in this understanding could be attained, an essay question was included on the final exam of the auditing course during the fall of 2005. The auditing course is a required course for all accounting majors seeking an emphasis in “public accounting.”⁵ The essay question, which contains three parts, is shown in Table 4. The first part required an objective answer pertaining to the definition and objectives of a system of internal controls. The second part evoked a higher-level skill requiring each student to apply the principles of internal controls to a specific transaction processing system, the expenditure cycle. The third part of the question required analysis, in that students’ were requested to identify the results of internal control weaknesses in the expenditure cycle.

The three parts of the question require successive levels of depth of understanding relevant to Bloom’s taxonomy. Bloom identified six levels within the cognitive domain (e.g., knowledge, comprehension, application, analysis, synthesis, evaluation).⁶ Defining internal controls represents the lower end of Bloom’s taxonomy. A more abstract mental activity is assessing the potential for errors and fraud if the duties in the expenditure cycle are not segregated (the higher end of Bloom’s taxonomy).

Treatment Condition

In the spring 2006 auditing class the curriculum was modified to include an extended lecture on internal controls in the expenditure cycle.⁷ The objective of providing additional coverage was to enhance students’ understanding of internal controls and to close the loop, so to speak, on any deficiencies in their learning outcomes. The extended lecture included more discussion of understanding the dimensions and the definition of internal control, as well as a greater emphasis on appreciating what key duties and jobs need to be segregated.

The same essay question included on the fall, 2005 final examination, and shown in Table 4, was included on the final examination for the students enrolled in the spring, 2006 course.⁸ Using the identical question in the spring allowed a comparison of student performance as a result of the treatment condition.

Scoring the Examination Questions – Independent Variable

A total of 21 students completed the fall 2005 auditing course, took the final examination and provided an answer to the internal control essay question. In the spring, 2006 auditing course, a total of 26 students completed and provided an answer to the internal control question on the final examination. To enhance internal validity in the scoring of the internal control questions, the 47 student responses were photocopied and randomly sorted using a random number table. In addition, the student names did not appear on any of the photo-copied responses. Therefore, when scoring the essay questions, the evaluators did not know if the question responses were from the control or from the treatment groups. This provided a reasonable control against bias in the scoring of the student responses and supports a reasonably clean assessment of the effect of the treatment condition on student learning.

⁵ The accounting program at our university includes three curriculum paths: (1) a Public Accounting track with a course of study designed for students seeking a career in auditing, (2) a Management Accounting track with a course of study designed for students seeking a career in industry, and (3) an Accounting Information Systems track for students seeking a career in systems auditing or design. Over ninety percent of our students choose the Public Accounting track.

⁶ See <http://www.officeport.com/edu/blooms.htm>

⁷ Other learning competencies were not ignored. Faculty in the intermediate and advanced financial accounting courses were aware of the importance of students being able to understand GAAP and preparing financial statements that were consistent in form and content with current professional standards.

⁸ The final examinations administered during the fall, 2005 semester were not returned to students in order to prevent knowledge transfer of the question to students enrolled during the spring, 2006 semester. Students in both semesters automatically received full credit for this essay question to ensure fairness for all students. Not grading this question allowed clean and unmarked photocopies of students’ answers to be available for the evaluators.

Each part of the three-part essay question was subsequently evaluated independently by two accounting educators using the rubric as described in Table 5. Using agreed-upon rubrics is recognized by the AACSB as an effective approach to evaluate learning competencies for assessment purposes (Martell & Calderon 2005). Evaluator #1 was an accounting educator who did not teach the auditing course, but nevertheless had an in-depth understanding of internal controls. Evaluator #2 was the instructor of the auditing course.

Table 5: Assessment Rubric

	Below Expectations 1	Meets Expectations 2	Exceeds Expectations 3
Define internal control and the objectives of a system of internal controls	Identifies fraud prevention as a goal and lists no objective or one objective.	Identifies management's role and lists two objectives.	Identifies internal control as a set of policies and procedures to ensure the safeguarding of an entity assets and the reliability of its accounting records.
List the key segregation of duties in the expenditures cycle – the request, ordering, and payment for merchandise inventory	Identifies the segregation of no or one pair of functional areas.	Identifies the segregation of two pairs of functional areas.	Identifies the segregation of more than two pairs of functional areas.
What errors or fraud can occur if the duties in the expenditure cycle are not segregated	Identifies no or one error or fraud.	Identifies two errors or fraud.	Identifies more than two errors or fraud and links the errors or fraud to the functional pair that should be segregated.

Each evaluator assigned a score on a three part scale. A score of “1” was assigned if the student did not “meet expectations” of that expected of someone with an understanding of internal controls (i.e., the student did not answer the question correctly as specified by the criteria in the rubric). A score of “2” was assigned if the student “met expectations” of someone with an understanding of internal controls (i.e., the student answered the question mostly correctly as specified by the criteria in the rubric). A score of “3” was assigned if the student “exceeded expectations” of someone with an understanding of internal controls (i.e., the student provided an excellent answer – completely correct).

After independently scoring the 47 student responses, the two evaluators convened to discuss any differences in the resulting scores. Where differences occurred between the evaluators, the individual student’s response was examined and rescored so that a consensus score was applied to the response. The

frequencies of agreement between the two evaluators were 77%, 59%, and 66% for parts (1), (2), and (3), respectively. More importantly, the statistical analysis performed on the data set generated from each evaluator was consistent with the consensus results as reported in Table 6. Interestingly, it appears that the instructor of the auditing course tended to evaluate students higher.

3. Results

Table 6 displays the results of student performance on the internal control question across both semesters; fall semester (control group) and spring semester (treatment group). The data displays the number and corresponding percentage of students who scored at each of the three performance levels (below expectations, meets expectations, and exceeds expectations) on each of the three parts of the essay question.

Table 6: Results of Assessment Evaluations – Number (%) of Students Scored at Each Performance Level

	Question Part		
	Part 1	Part 2	Part 3
Fall Semester – Control (n = 21)			
Below Expectations	15 (71%)	5 (24%)	6 (28%)
Meets Expectations	6 (29%)	14 (67%)	14 (67%)
Exceeds Expectations	0 (0%)	2 (9%)	1 (5%)
Spring Semester – Treatment (n = 26)			
Below Expectations	1 (4%)	5 (19%)	6 (23%)
Meets Expectations	9 (35%)	11 (42%)	18 (69%)
Exceeds Expectations	16 (61%)	10 (39%)	2 (8%)
Key:			
1 - Did not meet expectations, i.e., did not answer the question(s) correctly			
2 - Met expectations, i.e., pretty much answered the question(s) correctly			
3 - Exceeded expectations, i.e., gave an excellent answer – completely correct			

When viewing the data in the top part of Table 6 we found the results of the fall semester (control group) somewhat discouraging. Only 29% of the students met expectations on the first part of the essay question and no students exceeded expectations.⁹

⁹ A question often asked by educators is what percentage of students must meet, or exceed, expectations in order to be satisfied that standards are being met. The Association to Advance Collegiate Schools of Business (AACSB) provides this guideline: “One emphasis in the Assurance of Learning Standards is to gather data on student learning to be used for the purposes of improving business curricula. For each learning goal, the school’s faculty will determine its minimum expectation or standard. There is no prescribed percentage of students that must meet the standards articulated by the faculty. What the review team will be looking for, instead, is how these data are used. Thus, a poor showing on student mastery of a learning goal (e.g., analytical reasoning) would only be a concern if the curriculum was not subsequently modified to improve student skills in this area. A second purpose for the learning goals is to communicate the competencies of graduates to students and employers. Thus, the

Performances on the other two parts of the question were better, in that about 75% of the students met or exceeded expectations. This divergence of results is interesting in that most students could not well articulate the definition or objectives of a system of internal controls (the answer required for part (1) of the essay question), but they could describe what controls should be in place within the expenditure cycle.¹⁰

Comparing the percentages between the fall semester students (control group) and the spring semester students (treatment group) indicates a performance improvement, at least on the first two parts of the essay question. For part (1), performance increases such that 96% of the students met or exceed expectations. For part (2), performance increases such that 81% of the students met or exceed expectations. Most of the increase in performance for part (2) resulted from a higher proportion of students who exceeded expectations (from 9% to 39%). The data in Table 6 indicates little difference in performance across groups for part (3) of the essay question.

A binomial z-test was carried out on the data and revealed statistically significant performance changes ($p < .05$) across groups for the student responses to part (1) and part (2) of the essay question.¹¹ Specifically, the percentage of students who scored below expectations for part (1) declined from 71% to 4%, while the percentage of students who exceeded expectations on part (1) increased from 0% to 61%. For part (2) of the essay question the percentage of students who exceeded expectations increased from 9% to 39%. No statistical difference was discovered for student performance on part (3) of the essay question.

4. Conclusions

The primary contribution of this study is that it illustrates a description of an assessment process. This study makes an interesting contribution on a very topical area of concern to accounting education. How do we actively involve the professional community in the assessment process? How do we rank learning competencies? How do we measure the assessment process? All accounting departments are challenged with these questions. The method described in this paper provides an effective framework for addressing these issues.

Internal controls were selected by a group of practitioners and faculty as a top area of concern for accounting students. Certainly, we would expect to find that students performed better as a result of including additional lecture material. However, it is the soliciting information from outside advisory councils, implementing changes, and assessing those changes which are foundational building blocks of good assessment practices. Assessment is an essential tool for evaluating the effectiveness of changes made in the teaching-learning process.¹² Assessment is incomplete without “closing the loop.” Educators must not stop after identifying learning competencies. Closing the loop must be a comprehensive process to include a continuous progression of evaluations, curriculum modifications, and re-evaluations of students’ understanding of learning competencies.¹³

goals should represent learning goals achieved by nearly all graduates, not just a portion. The review team will also examine whether the school’s performance standards are appropriate given the student body demographics and the school’s mission.” (see: www.aacsb.edu/resource_centers/assessment/frequently-asked.asp).

¹⁰ This finding is somewhat counterintuitive given our discussion earlier about Bloom’s taxonomy regarding successive levels of depth of understanding. The assessment process highlighted a weakness; that being students’ ability to articulate the definition and objectives of a system of internal controls and explain the segregation of duties in the expenditure cycle. We speculate that the instructor/course was already doing a satisfactory job in explaining what could happen if internal controls are deficient.

¹¹ Could the results be driven by the possibility that students in the spring course were better students than those enrolled in the previous fall semester course? To eliminate this alternative explanation, we examined final exam scores without the essay question. Final exams were not distributed back to students and the same exam was used in both the fall (control) and spring (treatment) semester. The mean, variance, and median for the control versus treatment groups were 66.2, 148.0, 70, and 63.0, 123.6, 65, respectively. Results from a t-test on the final exam scores indicated that there was no significant difference between the two classes ($p = .38$).

¹² Source: New Horizons for Learning (<http://www.newhorizons.org/strategies/assess/terminology.htm>)

¹³ Arens and Elder (2006) argue that changes in the accounting profession have had a significant effect on the knowledge and skills students need in the profession. Consistent with the authors’ recommendations, our faculty approved a new senior-level internal auditing & controls course which will be introduced into the curriculum in the spring of 2008.

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