

Toward a Theory of the Assessment Process at Business Schools

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Abstract

In the 1980's, a movement that began as a critique of the purpose and quality of public education in the United States led to the requirement that all colleges and universities that receive federal funds must create and implement formal assessment plans to measure student learning. This study developed a theoretical model of the assessment process at these institutions. The model hypothesized four stages for an effective assessment program: (i) Design, (ii) Measures, (iii) Reports, and (iv) Changes. The model was tested using data collected through a large-scale survey of 102 baccalaureate accounting programs. The results provided evidence that supports the model. The control variables included: size (enrollment), type (Carnegie Classification), location (geographical region) of the programs, assessment plan development stage, and frequency of assessment activity. Although the data were collected from accounting programs, the researchers believe that the findings are generalizable to the assessment process of other academic programs as well. Based upon the findings of this study, implications for universities going through the assessment process as well as theoretical contributions are discussed.

Keywords: accounting, assessment, business education, empirical research

Introduction

In 1983, the National Commission on Excellence in Education reported that students were graduating from higher education institutions in the United States without basic workplace skills. In response, the Secretary of Education, William Bennett, instructed accrediting organizations to require documentation of student learning outcomes in the assessment of higher education institutions (Palomba and Banta, 1999). Consequently, accrediting organizations required colleges and universities to document evidence of student learning without prescribing a particular assessment type or model to follow. Educators were asked to establish goals and objectives regarding learning outcomes and then to determine how well their courses and programs achieved them (Burke, 2002; Banta and Associates, 2002).

To meet accreditation requirements, universities dedicated scarce resources to support assessment activities. Institutions funded training workshops and seminars to prepare faculty and staff to conduct assessment activities. Many universities purchased assessment instruments to measure learning, invested in software packages to manage data collection and storage, and set aside class time for assessment activities (Ewell, 1991; Huba and Freed, 2000; Hutchings and Marchese, 1990).

Literature Review and Theoretical Model

Accrediting organizations, experts, and professional associations published an array of books and journal articles to provide direction for creating and implementing effective assessment programs. The abundance of advice on rules and practices with regard to the assessment process led to the following research questions: (i) what are the factors that shape the assessment process, and (ii) what are the relationships between the different factors of the assessment process?

To address these research questions, a theoretical model was constructed. The model divided the assessment process into four stages: (i) Design (principles and learning outcomes), (ii) Measures (direct and indirect assessment instruments), (iii) Reports (methods of reporting the results and the audiences that receive the reports), and (iv) Changes (changes made in the program as a result of the assessment efforts) as described in Figure 1.

Design Stage – Principles and Learning Outcomes

Design, the first stage identified in the theoretical model, encompasses assessment principles and learning outcomes. Experts in the field recommended the following principles for successful assessment plans: (i) accounting program has a clear explicitly stated purpose that guides assessment, (ii) assessment data are collected and analyzed, (iii) assessment focuses on improving student learning, (iv) assessment provides accountability, (v) student learning outcomes reflect the accounting program's goals and objectives for learning, (vi) student learning outcomes reflect the institution's mission and its values (American Association for Higher Education, 1992; North Central Association, 1994; Middle States Commission on Higher Education, 2002; Huba and Freed, 2000; Banta and Associates, 2002; Chickering and Gamson, 1987; Erwin, 2000).

Several studies showed that institutions identified the following skills as learning outcomes: (i) written and oral communication, (ii) critical thinking, (iii) problem solving, and (iv) information literacy (Gainen and Locatelli, 1995; Albrecht and Sack, 2000; Jones et al., 1994). Business education, in particular, focuses on the development of skills that enhance students' abilities to analyze financial data, integrate knowledge into new ideas, and evaluate information based on established standards and criteria (Carnevale et al., 1990; Brantley and Davis, 1997; Van Horn, 1995; Jones, 2002).

Accrediting organizations advised that learning outcomes should reflect the skills and knowledge expected of students upon completion of the program and that assessment activity should indicate whether students have realized those expectations (Association of American Colleges and Universities, 2002; Terenzini, 1997; American Institute of Certified Public Accountants, 2003; American Association for Higher Education, 1992; Maki, 2002a).

Measures Stage – Direct and Indirect Measures

Measurement instruments are the focal point of the Measures stage. Assessment measures provide information about students' competencies in selected areas and are predictive of students' future performance (Maki, 2002a). The American Accounting Association (AAA) published *Assessment for the New Curriculum: A Guide for Professional Accounting Programs* (Gainen and Locatelli, 1995) that compiled a list of the most frequently used direct and indirect assessment methods. Course-embedded direct measures are cost-effective assessment techniques that serve a dual purpose of evaluating student learning and providing a basis for assigning student grades. Examples include essays, reflective papers, and case studies. Direct measures that are not course-embedded include internships and standardized national licensure exams.

Indirect measures support evidence of student learning obtained through direct measures (Palomba and Banta, 1999; Walvoord et al., 1998). The most commonly used indirect measures of assessment discussed in the *Guide for Professional Accounting Programs* are surveys of current students, graduates, and employers that focus on the satisfaction and attitudes about educational programs. Maki (2000b) recommends using a combination of direct and indirect measures of assessment.

Reports Stage – Reporting Methods and Audiences

How institutions report assessment results and the audiences who receive the reports are included in the Reports stage. Assessment reports describe the purpose of assessment, the assessment process, the skills and knowledge assessed, the methods used to collect and measure learning, the findings, and the way the results are used to make specific improvements. Assessment reports reflect upon course material, program goals, methods of instruction, and other factors that shape the educational experience (Banta and Associates, 2002; Black and Duhon, 2003; Maki, 2002a). After assessment data are gathered, measured, evaluated, and organized into useful reports, the information is disseminated to constituents. Assessment reports can be shared with multiple audiences through school websites and reported in school catalogs and brochures for alumni and the general public. Marketing campaigns and school newspapers can convey assessment results to current and potential students (Huba and Freed, 2000; Farmer, 1999; Peterson and Augustine, 2000b).

Changes Stage – Changes as a Result of the Assessment Process

Assessment related changes are the focus of the Changes stage. Colleges and universities use assessment data to make changes in educational programs and improve student learning (Ewell, 1991; Erwin, 2000; Maki, 2002b; Martinson and Cole, 2002). Assessment results are used as feedback to modify teaching methods, student recruitment, curriculum, academic programs, student learning, and the assessment process. Assessment is a continuous improvement process focused on the fundamental purpose of the institution embodied in its vision and mission statement (Peterson and Augustine, 2000a; Maki, 2000a). It is imperative that the assessment process be evaluated to determine how well the assessment data reflect the institution's ability to meet its standards, whether the principles of assessment are being followed, and how well the course and program assessment activities complement each other (Huba and Freed, 2000; Banta and Associates, 2002).

Emergence of an Assessment Model

Few empirical studies on assessment activities were found in the literature. Hindi and Miller (2000) collected data on assessment practices in accounting departments of colleges and universities. The authors reported the use of assessment data, the purpose of assessment, the measurement instruments used, the institutions' stakeholders, and the skills assessed in 164 accounting programs, but they did not propose a model based on the findings.

Nichols (1995) captured the common elements of the process in a simple Five Column Model that served as a guide in practice. The Nichols' model advised each educational unit to create its own program goals (three to five recommended) and to evaluate and refine the learning experience. The model linked program missions, educational outcomes, assessment measures, data collection, and use of results. It repeated the cycle to attain continuous improvement but did not integrate the factors into a theoretical structure. This study builds upon the Nichols' model to link the factors into an integrated framework and proposed the following hypotheses (Figure 1):

Hypothesis 1 (H1): The more advanced the assessment plan design, the more extensively assessment instruments are used to measure student learning.

Hypothesis 2 (H2): The more extensively assessment instruments are used to measure student learning, the more often assessment results are reported to audiences.

Hypothesis 3 (H3): The more often assessment results are reported to audiences, the more extensively assessment-related changes occur.

Data Collection

Based on existing literature, a questionnaire (Appendix A) was developed and mailed to participants. The purpose of the questionnaire was to obtain information about assessment of student learning at higher education institutions' baccalaureate accounting programs. The first part of the survey consisted of a series of demographic questions about the type, size, and geographic location of the accounting programs. Other questions asked about the accounting programs' assessment plans, including their current stage of development, how often assessment activities occur, the types of assessment instruments used, and how the results are reported and used to bring about change. The survey was preceded by a pilot study. Twenty accounting program deans and department chairs participated in the pilot

study. The respondents suggested modifications for the questions and the cover letter. The Likert Scale was used to record responses to most of the questions in the survey with scales: extensively [1], often [2], somewhat [3], very little [4], and not at all [5].

The sample of undergraduate degree accounting programs was selected from the *Accounting Faculty Directory 2004-2005* (Hasselback, 2004). Deans, chairs, and directors of accounting programs were purposively selected as participants. The revised questionnaire was mailed to 786 administrators of undergraduate accounting degree programs at colleges and universities in the United States, and 102 responses were returned (13% response rate). The original study request generated 95 responses, and a follow-up request produced seven additional. Table 1 provides a description of the sample responses.

Three of the six traditional Carnegie classifications (Carnegie Classification of Institutions of Higher Education, 2000): doctoral, master's, and baccalaureate were used as program types. Size was measured by student enrollment in the accounting programs. Reported enrollment at participating programs ranged from as few as ten students to as many as 1200. The schools were grouped by size in three categories: small, mid-size, and large. Ten did not respond to the question. Responses were received from programs in six geographic regions: Middle States, New England, North Central, North West, Southern, and Western. New England, North West, and Western regions were excluded from the comparison by regions due to low response rates. Respondents reported various stages of assessment plan development by selecting one of five descriptive groups: (i) no plan created, (ii) plan will be developed soon, (iii) plan in the development stage, (iv) plan has been developed, and (v) plan is implemented. Six did not respond to the question (Table 4). Frequency of assessment (Table 5) was classified as (i) episodic, (ii) periodic, or (iii) ongoing. Episodic assessment occurs during program review for accreditation purposes or as needed. Periodic assessment occurs more often but is not an integral part of the accounting program. Ongoing assessment is a routine activity in the program. Thirteen surveys were returned with no response to the question.

Data Analysis

A confirmatory factor analysis (CFA) was the first step taken to determine the structure of the constructs of the model. The next step was to simultaneously test the stated hypotheses. Finally, the impact of the control variables was checked by testing the model for significant variations across different levels of the control variables. The overall sample of 102 cases was too low to permit testing the hypothesized relationships among the seven constructs based upon the 32 survey response items identified as significant variables in the structural analysis (Table 2). The response-to-item ratio of 3:1 was not adequate for the recommended range of at least five to ten times the number of respondents for every item in the structural model (Bentler and Chou, 1987).

Consequently, the hypothesized relationships were tested using AMOS path models (Figure 3) through traditional variables that were composed from the factors (Joreskog and Sorbom, 1989). As a check on the reliability of the composed variables for path analysis, the Cronbach alpha reliability test was performed. The variables had acceptable coefficients with most variables in the .80s and .90s along with a few at more moderate levels and all above .56 (Table 2).

Results

The CFA was performed using SPSS (Bryman and Cramer, 2001) and revealed an eight-factor structure. To achieve the scales shown in Table 2, several items were dropped due to low inter-item correlations discovered during the reliability analysis and significant cross-loadings discovered during the factor analysis. Content validity was maintained when problematic items were removed. No significant multicollinearity was present. Scales used in the structural equation model are presented in Table 2 with their Chronbach alpha values and factor loadings. The reliabilities indicate that the multi-item scales can serve as reasonable proxies for the items in Figure 1. All three-item and higher scales have reliabilities above 0.56. The CFA was run with all multi-item scales, and it exhibited a very good fit of the model to the data ($\chi^2 = 681.83$, 413 d.f., RMSEA = 0.08, NFI = 0.75, CFI = 0.80). Course-

embedded and direct external measures were combined into one factor in the structural model because they are both direct measures of assessment.

Structural Model

To test the hypotheses, a path analysis was employed. Figure 2 displays the structural model with parameter estimates and significance level ($\chi^2 = 375.90$, 25 d.f., RMSEA = 0.08, NFI = 0.79, CFI = 0.80). The results showed that all relationships between constructs were significant and in the hypothesized direction. When the hypothesized relationships in AMOS across different levels of the control variables were tested, no significant differences were found in the direction and strength of the coefficients. The results of the structural equation model provide evidence that the model is valid.

Post hoc Analysis of Control Variables

Although AMOS fit indices indicated no significant overall model relationship differences between different levels of the control variables, it was unclear whether mean value differences existed across the different levels. Such differences could indicate future research directions and possibly shed light on the meaning of the proposed assessment model for different control variables. Therefore, a one-way ANOVA test of the different levels of the control variables was made. Table 3 presents the control variables and results of the ANOVA tests.

The mean for Principles was significantly higher for institutions with master's programs than for those with doctoral programs ($MD = 0.63$, $p = 0.02$) and higher for the institutions with baccalaureate programs than for ones with doctoral programs ($MD = 0.76$, $p = 0.01$). A lower mean indicates a more advanced program that aligns more closely to the principles; therefore, the higher the mean the less the program adhered to the principles. The mean for Principles was significantly higher for small schools than for mid-size ($MD = 0.44$, $p = 0.04$). The mean for Principles was significantly higher for the North Central region than for the Southern region ($MD = 0.72$, $p = 0.001$). Similarly, the mean for the Changes made in the programs as a result of the assessment efforts was significantly higher for the Middle States region than for the North Central region ($MD = 0.54$, $p = 0.03$).

The mean for the Changes was significantly higher for the programs that were in the development stage than for the programs that already had implemented plans ($MD = 1.33$, $p = 0.001$), and similarly higher for the programs that had developed plans than for the programs that had implemented plans ($MD = 0.99$, $p = 0.01$). Programs that were planning to develop a plan had a higher mean for the use of Indirect measures than the programs that had already implemented plans ($MD = 1.15$, $p = 0.02$). The Principles also had a higher mean for the programs that had no plans than the programs that had already implemented plans ($MD = 1.50$, $p = 0.01$).

The mean for Outcomes was significantly higher for programs that performed an episodic assessment than for programs that performed periodic ($MD = 0.84$, $p = 0.03$) or ongoing assessment ($MD = 0.90$, $p = 0.001$). The mean for Principles was significantly higher for programs that performed episodic assessment than for programs that performed ongoing assessment ($MD = 0.57$, $p = 0.03$), and significantly higher for programs that performed periodic assessment than for programs that performed ongoing assessment ($MD = 0.96$, $p = 0.001$). Lastly, the mean for Changes was significantly higher for programs that performed periodic assessment than for programs that performed ongoing assessment ($MD = 0.78$, $p = 0.001$).

Interaction Effects between Control Variables

This study considered a system mature if it had implemented an assessment plan and engaged in ongoing assessment activity. A mature system has refined the process. It has fine-tuned its outcomes and principles, developed the most dynamic combination of direct and indirect measures, discovered any major deficiencies in the system, and made the necessary assessment-related changes to improve student learning. The results showed that assessment plans at institutions with doctoral programs' were more mature than those at institutions with master's and baccalaureate programs. Of the reporting institutions, 11% of those with master's programs and 15% with baccalaureate programs had not begun to create assessment plans, while 100% of the institutions with doctoral programs reported that they would either develop assessment plans soon or they were already involved in the assessment process (Table 4). Approximately 41% of institutions with doctoral programs had implemented plans; in comparison, 33% of those

with master's programs and only 26% of those with baccalaureate programs had implemented assessment plans. Survey results also revealed that 65% of institutions with doctoral programs, 46% of institutions with master's programs, and 58% of institutions with baccalaureate programs reported on-going assessment activity (Table 5).

A relationship between maturity and program size, measured by student enrollment, was also evident. Mid-sized programs appeared to be further advanced in the assessment process than large or small institutions. Although all programs in the large category indicated that they had developed assessment plans or would soon develop them, and 8% of the mid-size and 16% of the small institutions had not created plans, other factors support the assumption that mid-size programs are more mature than the large or small ones. Specifically, a greater percentage of mid-size programs (42%) reported that they had implemented assessment plans, while only 26% of the small and 36% of the large institutions had put assessment plans into action. Additionally, 62% of the mid-size programs' assessment activity was on-going, while only 47% of small and 46% of large institutions were engaged in on-going assessment (Table 5).

A relationship also existed between geographical region and maturity. Institutions in the North Central region appeared to have more mature assessment plans than those in the Middle States or Southern regions. In the North Central region, 40% of the programs had implemented assessment plans, while only 6% in the Middle States and 23% in the Southern region had begun the assessment process (Table 4). Also, 58% of the North Central institutions engaged in on-going assessment activities, with only 35% of the Middle States and 44% of the Southern region programs involved in on-going assessment practices (Table 5). The results indicated that mid-size doctorate-granting institutions in the North Central region have taken the lead in developing assessment plans for their accounting programs.

Discussion

The study results support all stated hypotheses: (H1) the more advanced the assessment plan design, the more extensively assessment instruments are used to measure student learning, (H2) the more extensively assessment instruments are used to measure student learning, the more often assessment results are reported to audiences, and (H3) the more often assessment results are reported to audiences, the more extensively assessment-related changes occur. Thus, the results help to answer the two research questions: (i) what are the factors that shape the assessment process, and (ii) what are the relationships between the different factors of the assessment process? The main factors in the assessment process are design of the assessment plan, measures used in assessment, reports of assessment results, and assessment related changes. These factors follow each other, and each factor depends on the previous one.

The results also suggest a correlation between the maturity of an assessment program and the extent to which assessment becomes institutionalized. An institution with a mature assessment process conducts continuous routine assessment activities to assure that students acquire essential skills and knowledge in the academic programs and ensure that the principles and outcomes consistently reflect the institution's mission and program goals. The findings indicate that programs with mature assessment processes focus more on design (principles and outcomes), place more emphasis on measures, and report more changes than programs just developing or refining their assessment plans. The post hoc analysis (Table 3) revealed that programs that were developing or had just developed assessment plans reported fewer changes than those that had implemented the assessment process. However, programs that had implemented assessment plans concentrated more on the design stage than those that had not developed plans, and programs that had implemented an assessment plan focused more on indirect measures than those that were planning to develop a plan. The doctoral programs assessment plans, which were found to be more mature than the master's or baccalaureate schools' plans, adhered more to principles than the master's or baccalaureate institutions. The more mature mid-size schools appeared to concentrate more on design than the small schools.

Another major finding indicated that assessment is a stage process (Figure 3). In an effective assessment plan a stage cannot be skipped. The model was tested and no direct link was found between the Design and Reports stages, the

Design and Changes stages, or the Measures and Changes stages. Assessment plans begin with the Design stage in which principles of good practice and the selection of program-appropriate learning outcomes form the foundation of a successful assessment process. Once the Design stage is complete, suitable assessment instruments are selected to assess student learning in the Measures stage. Following the Measures stage, the results are analyzed and reported to the appropriate audiences in the Reports stage. In the final Changes stage, the findings are used to make any necessary changes in academic programs that would lead to improvement in student learning.

Contribution and Recommendations

The proposed model has both theoretical and practical contribution. Theoretically, it combined all the constructs from the literature into a unified theory of a stage model for the assessment process at higher education institutions. This study created a theoretical framework for the assessment process that is generalizable to all colleges and universities that engage in assessment activity. Practically, the findings can be useful to all educational institutions that are developing or revising their assessment plans. This study confirmed that many faculty and administrators of accounting programs are actively involved in the assessment process. Based upon the findings and expertise of leading authorities in the field, the following recommendations are offered to encourage educators to continue to build strong, successful academic programs and assessment plans.

The assessment process must be completed in stages. First, the principles that guide assessment must be established, and the learning outcomes that reflect the skills and knowledge its graduates are expected to acquire must be identified in the Design stage. Second, to assure that valid reliable assessment data are compiled, assessment plans should consist of a combination of direct and indirect methods of assessment to observe student performance and to gather students' opinions and their level of satisfaction with academic programs. Collecting sufficient and representative data using a greater variety of methods to document students' knowledge and skills development is critical to the Measures stage. Third, to facilitate a greater understanding of the education process and to generate relevant feedback that can result in further refinement, assessment results should be analyzed and shared with appropriate constituents on a regular basis in the Reports stage. Fourth, in the Changes stage, comparing assessment results over time will permit faculty to discover patterns and trends that identify areas in the curriculum or program that need attention and to make changes and improvements when necessary to enhance student learning.

Future Research

Future studies could identify which assessment instruments are used in the assessment process and how effectively they measure the level of development of established learning outcomes. Researchers could concentrate on how the faculty and administrators report assessment data and which groups receive the assessment information. The findings could reveal to what degree faculty and administrators share and publish assessment results to make them available to constituents. Other studies could explore how useful the assessment data are from the perspectives of the constituencies. Finally, future research could focus on institutions that report changes in curriculum and academic programs that resulted in improved student learning based on assessment findings and acknowledge them as best practices in assessment for successfully closing the loop.

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Appendix A

Undergraduate Accounting Program Assessment Questionnaire

This survey seeks information about the content and structure of your undergraduate accounting program’s assessment process, the student skills assessed, the assessment methods used, and how results are used to make changes in the program and improve student learning. Please review the following statements and record the appropriate response as indicated. Please indicate the appropriate response for each statement.

Size: Number of students currently enrolled in program: _____

Development of Assessment Plan

Please select the statement that best describes the level of development of the assessment plan for your program.

- The baccalaureate accounting program faculty
 has not created an assessment plan.
- will develop an assessment plan in the near future.
- is developing an assessment plan.
- has developed an assessment plan.
- has implemented an assessment plan.

Frequency of Assessment

The assessment process at this institution is

- episodic; assessment occurs during program review, for accreditation purposes, or as needed.
- periodic; assessment occurs periodically, but it is not an integral part of the accounting program.
- on-going; assessment is a routine activity in the program.

Design Stage: Principles

	Extensively	Often	Somewhat	Very Little	Not At All
	1	2	3	4	5
The accounting program has a clear explicitly stated purpose that guides assessment in the program.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assessment data are collected and analyzed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assessment focuses on improving student learning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assessment focuses on accountability.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student learning outcomes reflect the accounting program’s goals and objectives for learning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student learning outcomes reflect the institution’s mission and its values.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Design Stage: Outcomes

These essential skills are identified as student learning outcomes in the accounting program’s assessment plan:

	Extensively	Often	Somewhat	Very Little	Not At All
	1	2	3	4	5
Critical Thinking: The ability to critically analyze, synthesize, and evaluate information as a guide to action.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information Literacy: The ability to identify, find, understand, evaluate and use information appropriately.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oral Communication: The ability to organize ideas and communicate messages appropriate to listeners and situations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Problem Solving: The ability to recognize, define, and analyze problems and to identify key causes and solutions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Written Communication: The ability to communicate thoughts and ideas in writing,					

completely and accurately, in the appropriate format, using proper grammar, spelling, and punctuation.

Measure Stage: Direct Methods

	Extensively	Often	Somewhat	Very Little	Not At All
	1	2	3	4	5
Please indicate the methods used to assess student learning					
Essays	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Case Study	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internships	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reflective Papers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Standardized Or National Licensure Tests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Measure Stage: Indirect Methods

Alumni Surveys	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student Surveys	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Employer Surveys	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Reporting Stage: Audiences

Please indicate the groups or individuals that receive assessment reports.

Assessment data is reported to:

	Extensively	Often	Somewhat	Very Little	Not At All
	1	2	3	4	5
Students.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
General Public.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alumni Organizations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Reporting Stage: Means

Please indicate the methods used to disseminate assessment results.

	Extensively	Often	Somewhat	Very Little	Not At All
	1	2	3	4	5
The institution disseminates assessment data via:					
School newspapers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing campaigns.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Institution's website postings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Institution's catalog and brochures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

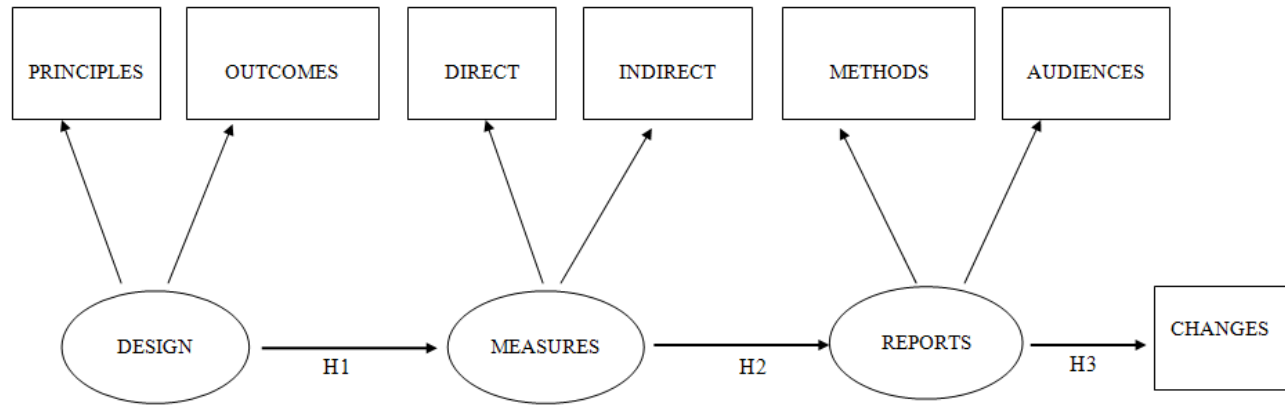
Change Stage:

Please check the areas in which changes have occurred due to assessment.

Assessment data has led to improvements in these areas:

	Extensively	Often	Somewhat	Very Little	Not At All
	1	2	3	4	5
Curricular changes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Program review.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student recruitment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student learning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The assessment process.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Faculty teaching techniques.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 1. Hypothesized Theoretical Model



**Goodness of Fit Index = 0.80; Normed Fit Index = 0.79; Chi-Square (25 df) = 375.9,
RMSEA = 0.08**

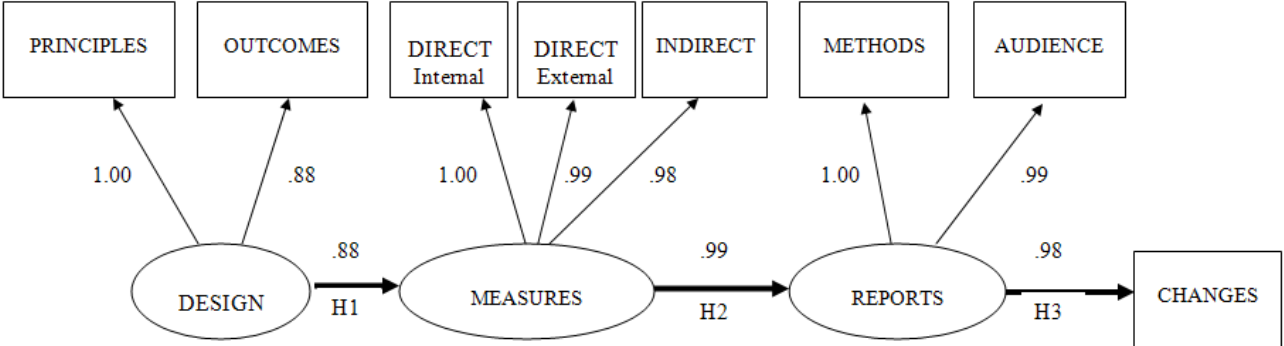
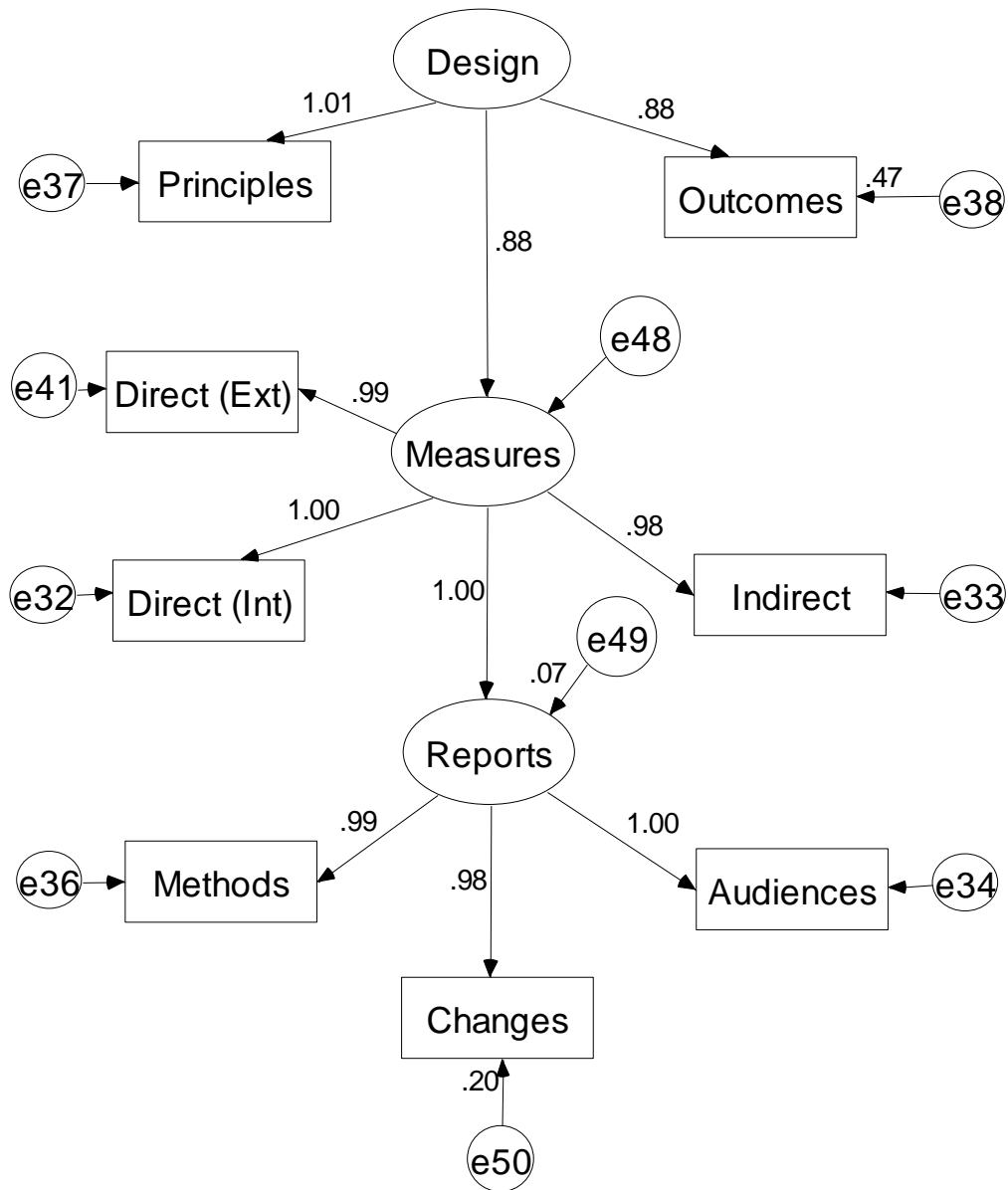


Figure 3. AMOS Results



CFI = 0.80 NFI = 0.79, Chi-Square (25 d.f.) = 375.9, RMSEA = 0.08

Table 1. Sample Responses

Type of Program	Number	Percentage (%)
Doctoral	20	19.6
Master's	53	52.0
Baccalaureate	<u>29</u>	<u>28.4</u>
Total	102	100.0
Size by Student Enrollment		
Small (<200)	43	42.2
Mid-size (200-400)	38	37.2
Large (>400)	11	10.8
Missing	<u>10</u>	<u>9.8</u>
Total	102	100.0
Geographical Region		
Middle States	18	17.6
New England	1	1.0
North Central	45	44.1
North West	6	5.9
Southern	27	26.4
Western	<u>5</u>	<u>5.0</u>
Total	102	100.0
Assessment Plan Development		
Not created	10	9.8
Will develop soon	10	9.8
In development stage	30	29.4
Plan has been developed	15	14.7
Plan implemented	31	30.4
Missing	<u>6</u>	<u>5.9</u>
Total	102	100.0
Assessment Frequency		
Episodic	20	19.6
Periodic	22	21.6
On-going	47	46.1
Missing	<u>13</u>	<u>12.7</u>
Total	102	100.0

Table 2. Factor Loadings of Variables

Variables	1	2	3	4	5	6	7	8
Changes: (alpha = 0.89)								
Changes due to assessment-improve student learning	0.87	0.12	0.16	0.05	0.15	-0.03	-0.05	0.07
Changes due to assessment-faculty teaching process	0.83	0.03	-0.01	0.21	-0.01	0.06	0.08	0.03
Changes due to assessment-program review	0.80	0.03	0.09	0.08	0.16	-0.06	-0.02	0.19
Changes due to assessment-curricular changes	0.80	0.05	0.33	0.18	0.05	0.07	0.11	-0.05
Changes due to assessment-student recruitment	0.68	-0.11	0.06	0.30	0.00	0.10	0.06	0.11
Changes due to assessment-assessment process	0.66	0.16	0.30	0.16	0.24	-0.02	-0.04	-0.02
Design:								
Outcomes (alpha = 0.92)								
Identifies Critical Thinking	0.02	0.86	0.20	-0.01	0.00	0.16	0.02	0.06
Identifies Written Communication	0.07	0.84	0.23	0.08	0.20	0.13	0.12	0.02
Identifies Oral Communication	-0.03	0.82	0.22	0.11	0.23	0.03	0.03	-0.07
Identifies Problem Solving	0.07	0.80	0.23	-0.14	0.00	0.11	0.03	0.05
Identifies Information Literacy	0.10	0.77	0.30	0.13	-0.22	0.03	0.00	0.01
Principles (alpha = 0.89)								
Improves student learning	0.24	0.27	0.74	-0.03	0.13	0.02	0.18	-0.12
Reflects institution's mission	0.09	0.36	0.73	0.02	0.05	-0.04	-0.11	0.21
Accountability	0.13	0.19	0.73	0.11	0.04	0.03	0.14	-0.14
Reflects program goals etc	0.10	0.40	0.71	0.06	0.16	0.09	-0.09	0.25
Stated purpose	0.10	0.31	0.71	-0.19	0.07	0.22	0.28	0.07
Assessment data are collected and analyzed	0.33	0.19	0.70	-0.08	-0.11	-0.10	0.25	-0.02
Reporting:								
Methods of reporting results (alpha = 0.84)								
Dissemination by school websites	0.23	0.09	0.05	0.79	0.28	-0.18	-0.03	0.03
Dissemination by school catalog and brochures	0.33	0.04	0.04	0.75	0.12	0.13	0.14	0.02
Dissemination by marketing campaigns	0.26	0.12	0.03	0.73	0.22	0.18	0.27	0.07
Dissemination by school newspapers	0.13	-0.06	-0.12	0.73	0.03	0.14	0.13	0.13
Audiences (alpha = 0.66)								
Reported to alumni organizations	0.21	0.07	0.19	0.31	0.68	0.08	0.15	0.03
Reported to general public	0.05	-0.13	0.40	0.36	0.64	-0.11	-0.01	0.10
Reported to students	0.19	0.09	-0.06	0.08	0.61	0.24	0.12	0.18
Measures:								
Direct methods – course embedded (alpha = 0.74)								
Reflective Papers	0.14	0.25	-0.14	0.07	0.52	0.49	0.12	-0.15
Case Study	-0.01	0.15	0.18	0.13	-0.02	0.85	-0.14	0.16
Essays	0.04	0.18	-0.02	0.08	0.19	0.82	0.02	-0.11
Indirect methods (alpha = 0.73)								
Alumni Surveys	0.00	0.18	0.09	0.14	0.22	-0.02	0.79	0.00
Student Surveys	0.04	-0.10	0.28	0.24	-0.04	-0.01	0.71	0.23
Employer Surveys	0.12	0.08	0.19	0.18	0.37	-0.25	0.49	0.37
Direct methods – external (alpha = 0.56)								
Internships	0.13	-0.02	0.07	0.11	-0.04	0.18	0.16	0.81
Standardized National Licensure	0.16	0.12	-0.05	0.10	0.32	-0.27	0.08	0.68

Table 3. Post Hoc Comparison of Assessment Construct Means by Control Variables

Dependent variable ^a	(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
OUTCOMES	Episodic	Periodic	0.84	0.30	0.03	0.07	1.61
	Episodic	Ongoing	0.90	0.26	0.00	0.23	1.56
	Periodic	Ongoing	0.05	0.24	0.97	-0.58	0.69
PRINCIPLES	Doctoral	Master's	-0.63	0.21	0.02	-1.19	-0.08
	Doctoral	Baccalaureate	-0.76	0.24	0.01	-1.38	-0.13
	Master's	Baccalaureate	-0.12	0.19	0.78	-0.61	0.36
	Middle States	North Central	-0.22	0.20	0.51	-0.74	0.28
	Middle States	Southern	0.49	0.23	0.11	-0.09	1.09
	North Central	Southern	0.72	0.19	0.00	0.22	1.23
	Small	Mid-size	0.44	0.16	0.04	0.01	0.87
	Small	Large	0.31	0.34	0.63	-0.56	1.20
	Mid-size	Large	-0.12	0.34	0.93	-1.00	0.75
	Episodic	Periodic	-0.39	0.23	0.24	-1.00	0.21
	Episodic	Ongoing	0.57	0.20	0.03	0.04	1.09
	Periodic	Ongoing	0.96	0.19	0.00	0.46	1.46
	No plan	Implemented	1.50	0.39	0.01	0.30	2.70
INDIRECT	Will develop	Implemented	1.15	0.33	0.02	0.13	2.17
CHANGES	Episodic	Periodic	-0.52	0.26	0.14	-0.19	0.14
	Episodic	Ongoing	0.25	0.22	0.51	-0.32	0.83
	Periodic	Ongoing	0.78	0.21	0.00	0.22	1.33
	Middle States	North Central	0.59	0.22	0.03	0.02	1.16
	Middle States	Southern	0.54	0.25	0.11	-0.11	1.20
	North Central	Southern	-0.05	0.21	0.97	-0.60	0.50
	Developing	Implemented	1.33	0.21	0.00	0.67	1.98
	Developed	Implemented	0.99	0.26	0.01	0.20	1.78

^a Only variables for which there are differences across different levels of control variables are presented

Table 4. Assessment Plan Development by Program Size, Type, and Region

	Not Created		Will develop soon		In the development stage		Plan has been developed		Plan Implemented		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Type of Program												
Doctoral	0	0	4	24	4	24	2	11	7	41	17	100
Master's	6	11	4	8	17	33	8	15	17	33	52	100
Baccalaureate	4	15	2	7	9	33	5	19	7	26	27	100
Size by Student Enrollment												
Small	7	16	4	9	16	37	5	12	11	26	43	100
Mid-size	3	8	3	8	8	21	8	21	16	42	38	100
Large	0	0	3	28	4	36	0	0	4	36	11	100
Geographic Region												
Middle States	2	12	2	12	8	47	4	23	1	6	17	100
New England	0	0	0	0	1	100	0	0	0	0	1	100
North Central	3	7	5	11	13	29	6	13	18	40	45	100
North West	0	0	2	40	2	40	1	20	0	0	5	100
Southern	5	22	1	4	5	22	3	13	9	39	23	100
Western	0	0	0	0	1	20	1	20	3	60	5	100

Table 5. Assessment Frequency by Program Size, Type, and Region

	Episodic		Periodic		On-going		Total	
	N	%	N	%	N	%	N	%
Type of Program								
Doctoral	4	23	2	12	11	65	17	100
Master's	10	21	16	33	22	46	48	100
Baccalaureate	6	25	4	17	14	58	24	100
Size by Student Enrollment								
Small	9	24	11	29	18	47	38	100
Mid-size	7	19	7	19	22	62	36	100
Large	3	27	3	27	5	46	11	100
Geographic Region								
Middle States	6	35	5	30	6	35	17	100
New England	1	100	0	0	0	0	1	100
North Central	8	19	10	23	25	58	43	100
North West	0	0	0	0	5	100	5	100
Southern	5	28	5	28	8	44	18	100
Western	0	0	2	40	3	60	5	100