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**Development,
Implementation, and
Assessment of Course
Learning Outcomes**

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INTRODUCTION

Continuous improvement programs are becoming increasingly important to business schools and outcomes assessment is a crucial feature of continuous improvement programs. Continuous improvement programs may be instituted for internal reasons, to face the challenges of competitive forces, or to meet requirements of accrediting bodies. The American Assembly of Collegiate Schools of Business (AACSB) stresses continuous improvement in its current accreditation standards (AACSB, 1993). Mottilla et al. (1997) cite competitive pressures and the need to adapt successful practices from private industry as key reasons for continuous improvement.

Identification of learning outcomes is essential to establishing targets for improvement and measuring performance against them is essential to implementing a program of continuous improvement to meet accreditation standards. Learning assessment is also becoming a key accreditation requirement of general accrediting bodies such as the North Central Association, Lopez (1998).

Assessment of common learning outcomes relative to a set of peer institutions based on benchmark performance measures has been proposed as a method for measuring performance. The performance measures used typically have included both summary institutional data and results from surveys of student perceptions of outcomes attained.

Prominent examples of the use of benchmarking include: the AACSB partnership with Electronic Benchmarking Inc. (EBI) consulting firm which provides a benchmark currently used by over 100 schools (AACSB/EBI, 1998) and a partnership of AACSB accredited teaching-oriented schools in the Southeastern United States who jointly developed benchmark standards and are measuring their performance against them (Payne and Whitfield, 1999).

In addition to these benchmarking efforts, a number of schools have developed their own assessment instruments for evaluating program outcomes at or near the time of graduation. For example, Tarjan and McNamare (2000) describe such a program which includes a multiple choice test on 10 subject matter areas, as well as, a number of questions dealing with attitudes and values.

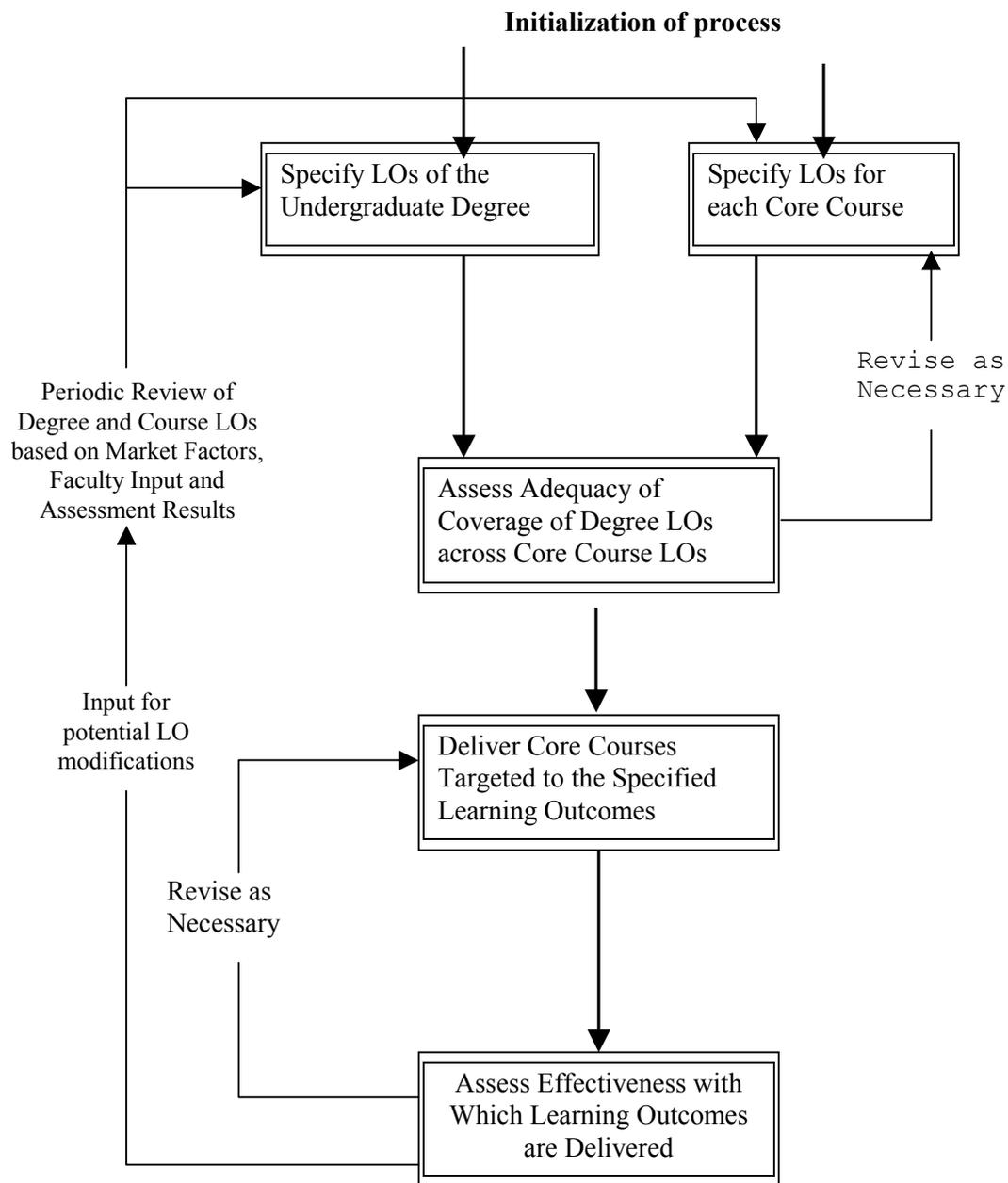
While benchmarking and exit testing or interviewing may provide a good view of learning outcomes at the macro level, it does not provide information at the level of detail needed to directly link student performance in the courses of a curriculum to the desired learning outcomes. Miller (1999) argues that effective assessment of learning outcomes at the course level requires 1) establishment of a set of standards as to what the student should know, 2) evaluation of the relevance of the instructor's course materials used to meet these standards, and 3) evaluation of how effectively the instructor applied these materials to ensure student learning. Jacob (1998) describes the application of a similar process at the university-wide level at Chico State University. He emphasizes the importance of getting faculty and stakeholder involvement in determining the standards of item 1) above.

The development of an outcomes-based curriculum has been linked with a focus on an integrated curriculum (Bliss and Potter, 2000). And expected learning outcomes of existing courses have been enumerated and laid out together to identify areas where they could be combined in a broader integrated framework to support curriculum integration (Gwin and Gwin, 2000) (Frings, Prinzing and Schneider, 2000). In a broader context, Cunningham and Omolayole (1998) suggest using a course-outcome matrix in which program learning outcomes are established and the contributions of each course to those outcomes is evaluated. They describe methods that might be used for assessment, but present no assessment results. In this paper we extend the course-outcome matrix concept and present preliminary assessment results from the core business curriculum.

A PROCESS FOR DEVELOPING LEARNING OUTCOMES

This paper describes efforts of one school, the Northern Arizona University College of Business Administration (NAU-CBA) to develop and implement a process for establishing appropriate program learning outcomes and assessing the contribution of specific courses to those outcomes. Figure 1 summarizes this process. As Figure 1 suggests, the process begins with the identification of program learning outcomes that all graduates are expected to achieve and simultaneous identification of more specific learning outcomes expected of each core course. Using faculty input, results from surveys of graduates and employers, and learning outcomes documents from other colleges of business, the NAU-CBA curriculum committee developed an initial set of learning outcomes expected of all students receiving an undergraduate business degree. These outcomes were designed to describe the capabilities expected of graduates in broad terms. For example, the ability to "identify problems and opportunities, generate alternatives and apply problem solving techniques in business situations" was defined as a core outcome describing problem-solving capabilities expected of all graduates.

Figure 1: A Process for Developing and Assessing Learning Outcomes



While the core outcome definition process was taking place, faculty of the area responsible for teaching each of the core courses were also defining expected learning outcomes for their courses. The "core" is a set of 21 credit hours of upper division courses that must be completed by all students receiving an undergraduate business degree from NAU-CBA. The course learning outcomes were designed to be more specific descriptions of sets of skills and knowledge operationally meaningful to the instructor in a specific course. For example, "calculating returns and riskiness of returns for various assets" and "forecasting financial statements and determining financing needs" were two course outcomes defined for the introductory finance course that happen to contribute to the broad problem-solving capability described as a program outcome above. This identification of learning outcomes was an important component in a process of revising and extending the content of the master syllabi used to direct course delivery. Table 1 lists the set of learning outcomes defined for the undergraduate core while Table 2 lists course learning outcomes for a representative set of individual courses. These tables also present analysis of the outcomes that is further described below.

As Figure 1 suggests, once initial program and core course learning outcomes were specified, it was time to assess the degree to which the learning outcomes of the core courses collectively meshed with the learning outcomes defined for the program. For initial assessment of this fit, the members of the curriculum committee examined each course learning outcome and indicated which program learning outcome(s) it contributed to, if any. These individual ratings were summarized in spreadsheet form and reviewed by the entire committee. The result of this review was a spreadsheet, summarized in Table 1, which indicated that the number of course learning outcomes supporting various program learning outcomes varied substantially. Because this spreadsheet was the result of judgments made by a few faculty based on outcomes which were not ranked by importance or intensity of coverage, no attempt was made to numerically balance the coverage of topics. Instead, these results were used as a starting point for revising the set of program learning outcomes and for suggesting changes to core course learning outcomes. Further review of program and course learning outcomes was conducted by the curriculum committee, both sets of outcomes were reviewed by the full faculty in a retreat setting, and revisions to the sets of learning outcomes were made based on these inputs.

Table 1: Learning Outcomes of the Undergraduate Core and Related Course Learning Outcomes

Core Outcome	Abbreviated Description	Number of Related Course Outcomes	
		Primary	Secondary
Problem Solving	Identify problems/opportunities, generate alternatives and apply problem solving techniques in business situations	42	37
Communication	Communicate effectively in oral and written form and utilize presentation tools effectively	9	17
Legal/Ethical Issues	Understand basic ethical and legal considerations and incorporate them in business decision making	8	19
Org. Behavior & Group Skills	Apply concepts of organization behavior to real world situations involving working with and leading people	15	17
Business Processes & Systems	Understand basic business processes and systems - effectively query and use information from systems	19	32
International Issues	Understand basic principles of international business and know when and how to apply them in business situations	6	21
Economic Markets	Understand the core elements of a market economy and the impact of government policy on economic entities	19	8
Software Tool Use	Use common software tool to retrieve, organize and analyze data and to create documents and presentations	7	10
Financial Statement Use	Prepare basic financial statements and to use them to assess operating performance and financial position	16	21
Financial Markets	Understand financial markets and institutions and their impact global domestically and at the level of the firm	5	18
Financial Resources	Understand the mechanism for obtaining and allocating resources in a market economy and apply this knowledge	6	37
Marketing	Understand how businesses profitably transform consumer wants/needs into demand for specific products	9	19
Knowledge and Skill Integration	Understand how knowledge and skills from all business disciplines bear holistically on business decision-making	3	44

ASSESSING LEARNING OUTCOMES

Once the set of master syllabi for core courses (including learning outcomes) had been approved, it was time to implement them - the bottom two boxes in Figure 1. Instructors began to teach under the new master syllabi and their individual course syllabi were compared to the master syllabi by their area coordinators. The intent of this assessment was to assure basic compliance with the goals of the master syllabi including coverage of content supporting the defined learning outcomes.

To further assess how effectively the learning outcomes for each course were being addressed in the delivery of the course, surveys were developed and administered to obtain student feedback about the extent of their learning for each course learning outcome. Students were asked if they felt they had learned:

1 - a great deal, 2 - some, 3 - a little, or 4 - nothing

about each of the learning outcomes specified for the course. Note that on this scale a lower rating indicates a higher level of learning. This survey was administered during the last two weeks of class in each section of a set of core courses.

Implementation was phased so that surveys were initially conducted in selected courses and then the process was expanded to the full set of upper division core courses. Summary assessment results for 4 courses where at least 3 semesters of data are available are shown in Table 2.

Table 2: Summary of Assessment Results for Selected Courses

Learning Outcome	Mean	Mode	Uniformity Test P-value
MANAGEMENT 300: MANAGING BEHAVIOR IN ORGANIZATIONS			
Understand the literature on managing people in organizations	1.67	2	.02
Understanding how your behavior impacts co-workers & employees	1.40	1	.01
Interpersonal and group interaction skills	1.41	1	.09
Written and oral communication	2.02	2	.01
Team development processes & interactions	1.38	1	.02
Causes of conflict & processes to resolve conflict in the workplace	1.68	1	.01
Individual & team decision making	1.50	1	.01
Working effectively in a diverse workplace	1.69	1	.01
FINANCE 311: PRINCIPLES OF FINANCE			
The institutional & tax environments in which firms operate	1.93	2	.01
Using financial statements to assess the financial health of fin-ns	1.42	1	.03
Adjusting the values of cash flows across time	1.61	1	.10
Calculating returns and riskiness of returns for various assets	1.42	1	.21
Identifying & calculating values for various financial assets	1.50	1	.18
Using capital budgeting to assess the value of investments	1.52	1	.03
Sources of capital available to firm's and their costs	1.57	1	.01
Forecasting financial statements and determining financing needs	1.54	1	.01
The importance of working capital to the firm's financial health	1.66	2	.07
Sources of short-term financing available to firms	1.61	1	.18
Determining optimal cash balances for firms	1.92	2	.07
Determining optimal levels of receivables & inventory investment	1.97	2	.01
Understanding international trade's impact on risks & opportunities	2.28	2	.01
CIS 360: MANAGEMENT INFORMATION SYSTEMS			
Strategic Significance of an information system to an organization	1.74	2	.01
The process for developing and managing as information system	1.89	2	.10
Understanding characteristics of functional areas supporting ISs	2.16	2	.01
Able to reliably collect and use data to support a workgroup	1.98	2	.03
Analyzing a business situation to determine IS requirements	2.16	2	.14
Assessing the appropriateness of an IS solution to a given problem	1.92	2	.02
MARKETING 333: INTRODUCTION TO MARKETING			
The contribution of marketing to the economy	1.38	1	.18
Relationship of the marketing plan to the company's strategic plan	1.33	1	.44
Relationship Marketing	1.50	1	.48
Market segmentation, targeting, and positioning strategies	1.15	1	.07
Impact of consumer behavior and satisfaction on marketing strategy	1.25	1	.45
Understanding marketing strategies to gain competitive advantage	1.49	1	.06
Market research and forecasting techniques	1.64	1	.56
Product development issues	1.67	1	.83
Characteristics of services industries and their marketing strategies	1.58	1	.39
Channels of distribution and their functions	1.27	1	.09
Push and pull strategies	1.38	1	.01
Pricing strategies and perceived value	1.24	1	.01

It should be noted that some broad statistical tests were performed whose results are not reported in Table 2. For each course, a Chi-Squared test was performed to determine whether the distribution of responses varied across the various learning outcomes. In each case the null hypothesis of no variation was rejected at the .001 probability level. This suggests that, in general, students took the survey seriously and did feel that there was variability in the amount of knowledge they had gained.

Table 2 presents an abbreviated description of each of the learning outcomes together with some descriptive statistics of the student responses. Both the mean and the modal (most frequent) response for each learning outcome is presented. Since the responses are ordinal rankings, mean values must be interpreted cautiously. Looking at the mean and mode values together, it is clear that most students felt that they had learned at least "some" about nearly all of the learning outcomes since only 4 of 39 learning outcomes had a mean greater than 2 and none had a mode greater than 2. In addition, the modal response for 26 of the 39 learning outcomes was a 1 indicating a plurality of students felt they had learned "a great deal" about the learning outcome topic. Table 2 also clearly shows variability across courses -the modal value was a 1 for all learning outcomes of the marketing course, but was a 2 for all learning outcomes for the management information systems course. This may reflect differences in effectiveness of delivery and/or differences in how clearly the learning outcomes descriptions were understood by students and is a topic for ongoing analysis.

For each class whose results are presented in Table 2, at least 11 different sections have been offered by at least three different instructors. The last column in Table 2 presents the results of a one-way ANOVA test of the null hypothesis that student responses for a learning outcome do not vary systematically across different sections of the course. The null hypothesis was rejected at the .05 level for about half (20 out of 39) of the learning outcomes. This provides a check of how consistently the learning outcome topics have been covered across different sections and instructors.

Learning outcomes with highly significant differences suggest areas for additional work. Faculty involved may need to work together to coordinate approaches to teaching the topic or to modify a learning outcome so that its meaning is more clearly understood.

The NAU-CBA chose to administer the assessment of learning outcomes survey in a manner that maintains the anonymity of the instructor and guarantees that the results are not used in evaluation. Clearly tying results of this type of evaluation to individual instructors and using them as a part of assessment of faculty job performance would substantially "raise the stakes." It would provide much stronger incentives to instructors to teach learning outcome topics as effectively as possible. At the same time, it would undoubtedly make the process of agreeing on a set of learning outcomes much more difficult and time consuming.

SUMMARY

Development and assessment of learning outcomes are critical elements of an effective process for continuous improvement of a college curriculum. Desired learning outcomes of a degree program tend to be defined in broad terms, while faculty organize their activities around more concrete and specific objectives for the outcomes of specific courses. This paper presents a process for integrating learning outcomes defined at these two levels. It is hoped that this process will enable faculty to see more clearly the tie between their effectiveness in achieving learning outcomes for their courses and achievement of overall programmatic learning outcomes.

This paper also describes a process for assessing the effectiveness of course learning outcomes through a student survey and presents summary results from those assessments. The results suggest that there were significant variations in how effectively various learning outcomes were delivered. The results included systematic variations across learning outcomes, across sections, and across courses which can be used to help direct future efforts to improve curriculum delivery and to refine the set of learning outcomes.

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