A PBL Framework for Introductory Management Accounting
A Business Planning Approach

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1. INTRODUCTION

> "The principal idea behind problem-based learning is ... that the starting point for learning should be a problem, a query or puzzle that the learner wishes to solve" (Boud, 1985, p. 13).

The most fundamental change in business education today is the reorientation from a "techniques-based curriculum" to what can be characterized as a "competencies-based curriculum." In the former, technical knowledge and proficiencies are viewed as the primary educational objectives. In the latter, a broad, core set of educational competencies is identified as the primary objective of the course curriculum (Herring & Williams, 2000). Such a reorientation is thought to provide long-term value to the student (and society), support life-long learning, and provide enhanced career opportunities for future business professionals.

Perhaps no field has undergone greater change recently than accounting. In the professional workplace, technology has virtually redefined the traditional role of the accounting/finance function from one of record keeping and external reporting to providing information that firms need to formulate, communicate, and accomplish their strategic initiatives. Given these changes, many accounting programs in the United States are actively engaged in a redesign of their curricula, for example to promote critical

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thinking and communication skills development. Over the past decade, various academic and professional accounting bodies have issued pronouncements calling for substantive curriculum change in accounting education.

Most notably, in 1990 the Accounting Education Change Commission (AECC) called for learning environments that position students as "active participants ... not passive recipients, (where students) identify and solve unstructured problems." This *Position Statement* was followed by a series of similar pronouncements from the Institute of Management Accountants (IMA), the American Institute of Certified Public Accountants (AICPA), and business school accreditation bodies (Nelson, et al. 1998). Collectively, these documents were intended to be catalysts; designed to motivate change in accounting education.

This paper provides a robust example of how problem-based learning (PBL) can be used to reengineer the sophomore-level managerial accounting course to increase its value in the course curriculum. The rest of this paper is organized as follows: In the next section, we provide background information regarding the primary catalysts for substantive curriculum change in accounting. We show how entry-level competencies set forth by the accounting profession and a commitment to a strategic plan (in this case, adaptive problem solving) jointly provides an overarching framework for implementing course-level changes. In Section 3, we illustrate how PBL offers a unifying mechanism for changing a specific course to better meet the entry-level competencies expected of financial professionals. Section 4 outlines the business planning model used to implement PBL. The concluding section addresses assessment issues and offers future extensions.

2. A FRAMEWORK FOR CURRICULUM REDESIGN AND COURSE REENGINEERING

We propose a three-step approach to better align business education with the needs of practice through curriculum redesign and course reengineering:

1. Identify *market expectations* regarding needed skills and competencies.
2. Define a supporting *learning environment* and curriculum.
3. Design and implement reengineered courses.

The accounting curriculum provides a rich context to illustrate the application of this three-step approach.

2.1   Market Expectations

In 1999, the American Institute of Certified Public Accountants (AICPA) issued a highly specific framework of core competencies expected of entry-level accounting professionals. As shown in Table 1, the AICPA *Framework* is structured around three competencies: functional competencies, personal competencies, and broad business perspective competencies. For each of these, Table 1 also presents critical "dimensions" (or components). For example, "functional competencies" include goals such as communication skills development, leadership skills development, etc.

Table 1: AICPA Core Competency Framework for Entry into the Accounting Profession.

Core Competency	Definition	Dimensions
Functional Competencies	Functional competencies relate to the technical competencies which are most closely aligned with the value contributed by accounting professionals	Decision Modeling Risk Analysis Measurement Reporting Research Leverage Technology to Develop and Enhance Functional Competencies
Personal Competencies	Personal competencies relate to the attitudes and behaviors of individuals preparing to enter the accounting profession. Developing these personal competencies will enhance the way professional relationships are handled and facilitate individual learning and personal improvement.	Professional Demeanor Problem Solving & Decision Making Interaction Leadership Communication Project Management Leverage Technology to Develop and Enhance Personal Competencies
Broad Business Perspective Competencies	Broad business perspective competencies relate to the context in which accounting professionals perform their services. Individuals preparing to enter the accounting profession should consider both the internal and external business environments and how their interactions determine success or failure. They must be conversant with the overall realities of the business environment.	Strategic/Critical Thinking Industry/Sector Perspective International/Global Perspective Resource Management Legal/Regulatory Perspective Marketing/Client Focus Leverage Technology to Develop and Enhance a Broad Business Perspective

For each competency dimension depicted in Table 1, the AICPA (1999) provides additional detail in the form of "elements" (i.e., specific abilities, skills, or other educational outcomes). For example, in the "Communication"

Measuring the Effect of Innovations in Teaching Methods on the Performance of Accounting Students

An Empirical Study Into the Relationship Between Learning Objectives, Teaching Methods, Knowledge Levels and the Performance of Students in an Accounting Context.

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1.   INTRODUCTION

Research on teaching methods that are employed in courses in abstract subject areas such as mathematics, physics and also accounting, shows that traditional methods of instructing and evaluating students still predominate to a large extent, based on teaching and evaluation methods such as lectures and multiple choice exams[8]. However, there are also examples of instructors or institutions that have either revised individual courses or have redesigned their entire curriculum to modernize and improve the educational process[9]. Teachers that are engaged in improving the educational process by looking for new and innovative ways to design their courses or organize their curriculum, inherently face the problem of measuring the impact of such changes. Usually, the effect of course revisions is measured by using student evaluations or changes in exam results. The primary argument of this article is that such instruments may provide an inadequate basis for evaluating the impact of educational changes on student performance. This premise was based on the experiences taken from the revision

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[8] For an overview of teaching methods used in accounting curricula of US institutions see Dow and Feldmann (1997)
[9] For accounting related examples see f.e. Stout and Mohanan (1998], Kirch and Cavalho (1998] and Porter and Carr (1999]

of an intermediate accounting course for business economics students. In the course discussed in this article the passing rate for the final written exam had been a problem for a number of years as less than 50% of the students passed the course exam, indicating that the applied teaching methods did not adequately prepare them to meet the course objectives. However, the annual student evaluations of this course revealed that the quality of this structure was rated satisfactory and students typically complained only on minor practical elements of the course that should be improved. These mixed signals eventually resulted in a project involving teaching staff, students and educationalists in which the structure of the course was re-evaluated through re-examining the learning objectives and the instructional design of the course. New learning objectives were specifically aimed at teaching students cognitive strategies to apply existing knowledge on accounting procedures in a new (unfamiliar) setting. From the objectives defined, a new instructional design was developed explicitly aimed to meet the course objectives. Given the inconsistent results of the student survey and the exam results, a research project was undertaken to assess the consequences of the changes in educational methods that were adopted.

The aim of this article is, therefore, to demonstrate the effectiveness of a change in teaching methods that was based on an explicit restructuring of learning objectives in the context of an intermediate accounting course. In doing so, the article discusses the measurement of educational innovations that aim to attaining specifically defined learning goals, particularly the ability of students to acquire meta-knowledge and procedural knowledge instead of declarative knowledge. Secondly, the article addresses the ongoing debate on the need for changes in both the content and teaching methods used in accounting courses, in order to better prepare accounting students for the requirements of business practices. The empirical part of the article focuses on the effects of teaching methods on the performance of students, using specifically designed research instruments together with student surveys or exam results. It aims to examine in various ways whether the innovations in accounting education succeeded in realizing the course objectives differentiating between various knowledge levels.

2.   MOTIVATION FOR CURRICULUM CHANGE

Abstract, model-oriented academic courses deviate from other types of courses to the extent in which the courses' participants have to rely on abstract models – in contrast, for instance, to reproductive knowledge. In terms of the taxonomy of Anderson (1990), such courses place a high emphasis on the ability of students to acquire meta-knowledge and procedural knowledge, instead of declarative knowledge. Intermediate bookkeeping courses are examples of such abstract courses, where students are required to obtain insight in the (high order)

rules of accounting problems. In many cases, courses on fundamental accounting procedures (such as bookkeeping) are treated as skills training, were students are required to reproduce accounting procedures in a (semi-) familiar setting. As a result of this approach, students acquire little insight into the general structure of accounting procedures and they lack the ability to apply the skills they have been taught, in unfamiliar settings, which they will encounter in practice. Therefore, courses on accounting procedures should aim to provide students with strategies to apply existing knowledge on accounting procedures and concepts (acquired in first level accounting courses) in settings that they have not faced before. In this respect, accounting educators face problems that are also documented in other educational fields such as physics (see Chi et al. [1981]) and mathematics (see Bonner & Walker [1994]).

Bonner (1999) argues that specifying learning objectives[10] should be the first step in the process in choosing appropriate teaching methods. In general, three types of learning objectives may be distinguished: verbal information, intellectual skills and cognitive strategies (Gagné, 1984). Verbal information is at the lower end of the scale and refers to the factual content of a particular area of knowledge. Given this type of objective, students are expected to reproduce factual knowledge presented to them, for example in the form of a definition. In this setting, students should be presented with factual information in an organized way, where the instructor facilitates the reproduction of knowledge by relating the teaching material to examples, explanations or related topics so that students can develop various ways to recall the information.

Intellectual skills involve various skills that all relate to the application of knowledge to novel situations. Such skills can vary from classification skills, where students are able to recognize particular instances to more general concepts (e.g., recognize a transaction as being a revenue or expense), to more advanced skills, where students are required to generate new rules by combining old rules (for example generate a journal entry for an accelerated depreciation method from existing knowledge on linear depreciation). In this context, instructors should present and facilitate the recollection of factual knowledge and rules. They should also facilitate the application of these rules to novel situations, by providing multiple examples from which students can generalize their knowledge and develop a framework from which they can apply their knowledge in a new – but not entirely unfamiliar - context.

The highest level of learning objectives involves the development of cognitive strategies by students. Given this objective, students are required to develop an effective and efficient strategy to solve an unfamiliar problem situation. Students may be familiarized with accounting procedures for leasing

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[10] A learning objective can be defined as a formal description of the projected outcome of the educational process.

The Hybrid Curriculum
The acquisition of academic competencies within a university curriculum

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1.   INTRODUCTION

It was just about twelve years ago, when our faculty was first founded and problem-based learning was then adopted as a leading educational principle (Van den Bosch & Gijselaers, 1993). The new curriculum was modeled according to the Maastricht example of problem-based learning (Bouhuijs, Schmidt, & van Berkel, 1993; Dolmans, 1994). We were quite impressed by its apparent success at the Maastricht University: Students seemed to learn more and they were able to better connect theory and practice. In addition, by working in small groups, they were able to develop their communication skills, and at the same time, they could quickly built up a network of social relationships. Moreover, the duration of their study was shortened on average.

This article describes the evolution of problem-based learning at our faculty since its first introduction. Over the years with the introduction of problem-based learning, the satisfaction of both students and teachers has been frequently measured, and the stronger and weaker points of problem-based learning have surfaced. At the same time, the faculty's educational goals have been refined and there has been more emphasis placed on the development of students' competencies. Much time has been spent in designing a curriculum, which is considered to be suitable to the acquisition of competencies. Confidence has grown in the belief that problem-based learning is a strong educational principle. However, it should be

[17] The Nijmegen School of Management is the new name of the Faculty of Policy Sciences.

supplemented by other educational arrangements. Our new curriculum, which is based on the blending of several educational principles, has been characterized as being hybrid.

The first section of this article is a description of our various experiences, while working with problem-based learning as it was first implemented. After that, the second section clarifies the students' competencies, Section 3 gives insight in the ultimate goals of our curriculum, the role which problem-based learning can play as well as the limitations themselves present. As a result, criteria for a hybrid curriculum will be defined in the forth section. The new business administration curriculum, which is constructed according to hybrid principles, is described section 5, while section 6 presents an overview of recent experiences.

2.   INITIAL EXPERIENCES

In 1988, the former Faculty of Policy Sciences first introduced problem-based learning. Problem-based learning concerns itself with the acquisition of knowledge by students and at the same time, the ability to apply this knowledge. In the traditional curriculum, the acquisition of knowledge and the application of the knowledge are more separated (Barrows & Tamblyn, 1980).

The experiences were both positive and negative. Many students worked with dedication and enthusiasm within the new curriculum. They mentioned that they had learned a lot and the collaborative work in small groups, supervised by a tutor, was highly appreciated in many evaluative studies. These evaluations also gave evidence that the students had learned to study more regularly and that they had become experts in the finding and editing of information. An analysis of their examinations proved that the students sufficiently understood the content. Several audits spoke in favor of problem-based learning, except for a few isolated remarks concerning the examination system.

With respect to the students' abilities to navigate with facts, concepts and theories, nevertheless feelings of dissatisfaction prevailed. Students were uncritical and they refused to relate bits of knowledge. They also were reluctant to use their acquired knowledge to outline real life situations. One must admit that exactly these features had been used to justify the introduction of problem-based learning.

The decision to carry out several research projects was taken, before a more fundamental revision of the curriculum was made. These projects were aimed at revealing the main characteristics of the learning environment by which learning behavior is influenced. The following characteristics, which

might be relevant, were considered: the content and form of the tasks and assignments, the interventions of the tutor, the method (the so-called 'seven-jump'), the presentation of the outcomes in 'logs' and so forth.

Figure 1 shows the various findings obtained (Van den Bosch & Gerritsen, 1997). In the first column specimen of less well-adapted learning behavior are listed. The second column refers to the characteristics of problem-based learning, which presumably provoke this kind of behavior.

Students' behavior	Corresponding characteristics of PBL
• The mechanical application of the seven-jump • The division of the literature between group members • Insufficient preparation at home of the tasks and assignments • Lack of self criticism	• PBL is justified as a teaching method instead of a simulation of scientific behavior • Tutors who are told that their task is primarily to guide the process, often rigidly refuse to participate in discussions
• Lack of initiative • Hiding behind a lack of information	• The large number of problems keeps students from collecting sufficient background information.
• Focus on examinations • Relying on fellow students' contributions	• Tasks and assignments reflect prior knowledge not the interests of students • Tasks are designed to cover a certain amount of subject matter. The problem formulation is obvious clear
• Students are focused on attaining bits of knowledge which correspond to their learning goals; the reflection on the problem formulation has been neglected • Students recite literally the content of the literature, they found	• The status given to the formulation and studying of learning goals is over-exaggerated. The discussion of the initial problem formulation deserves more attention.
• Students grow tired of PBL	• There is a lack of progression in method and there is a difference in the degree of difficulty between successive courses.

Figure 1: Less desirable learning behavior of students and characteristics of the learning environment within the Nijmegen School of Management.

Generally speaking, many students (and teachers) doubted the value of problem-based learning after having participated in two or three courses. The main reason for this attitude was thought to be due to the repetition of the procedures. Many students referred to the superficial treatment of problems. While interpreting these findings, the main question we concerned ourselves with was to which extend these problems are inherent in problem based learning and to which degree improvement in the execution of problem based learning is possible. In order to appreciate the inherent