

TEACHING INTERMEDIATE ACCOUNTING I USING PROBLEM-BASED LEARNING (PBL) CONTINUUM AND TEAM-BASED LEARNING (TBL)

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ABSTRACT

To integrate into Intermediate Accounting I professional skills (e.g., problem solving, communication, teamwork, analytical thinking, business decisions), five continuum PBL approaches (e.g., problem-assisted learning, problem-centered learning, problem-centered discovery learning) and a TBL Project have been successfully employed at several universities in different regions of the country. The PBL and TBL projects/cases including feedback/assessment activities were located/created using the Backward Design technique by starting with the AICPA, Pathways Commission, CGMA, and IFAC desired professional skill sets. An educator can use one or more of these PBL approaches to help students in learning.

Keywords: Intermediate Accounting; Professional Skills; PBL Continuum; TBL; Backward Design

INTRODUCTION

There has been a call for change in the approaches used in teaching accounting for more than thirty years by several professional accounting committees and organizations. Recently, there has been discussion by the Association of International Certified Professional Accountants in the *CGMA Competency Framework: 2019 Update* (2019) [CGMA Framework] about essential skills that are needed by managerial accountants. Also, the *AICPA Pre-Certification Core Competency Framework* (2019) [AICPA 2019 Framework] highlighted a set of skills-based competencies that are necessary for students who are beginning a career in accounting (public/industry/government/not-for-profit). In addition, the International Federation of Accountants (IFAC) in its International Education Standard 3 (IES3), *Professional Skills and General Education* (2019) identified the professional skills that are fundamental for individuals desiring to enter the accounting profession. In 2015, the Pathways Commission encouraged learning experiences or approaches that are expected to assist students in thinking, performing, and making decisions that are comparable to accounting professionals. Previously, the Pathways Commission (August 2014) proposed that quality education should involve the use of various teaching methods (e.g., lecture, problem solving, or problem-centered learning) that encourage students to enhance their ability to exercise professional judgment in decision making. In addition, Helliar (2013) advocated that a fundamental component of accounting education should embrace teaching methods that engage (enable) students (e.g., role playing, real-world case studies, and team-based learning). This paper presents several teaching approaches (e.g., problem-based learning) that can be used in teaching an Intermediate Accounting I course.

THEORIES

Taylor and Hamdy (2013) indicated that “learning” involves the acquisition of domains (i.e., knowledge, skills, and attitudes). Presently, adult learning theories can be divided or clustered into groups or categories (e.g., instrumental theories, humanistic theories). Further, it has been denoted that learning begins with the learner’s existing knowledge [e.g., Vygotsky (1997), Taylor and Hamdy (2013)].

Instrumental Learning Theories

Instrumental learning theories emphasize individual experiences in learning. In the instrumental learning cluster are the experiential and cognitive learning theories. The cognitive theory ties well into the idea that learning begins with the existing knowledge of the learner. For example, students can link new information related to their personal cash basis of transactions to the accrual basis of accounting reflected in financial statements prepared under GAAP.

Under experiential theory, the role of students is to actively participate in activities that construct their knowledge base. This theory appears to be applicable to accounting education because it places emphasis on the development of competencies (e.g., intermediate accounting topic(s), problem solving) and incorporates skills of practicing accountants (e.g., decision making, communication) in specified situation(s).

Humanistic Theories

Humanistic theories promote individual development. This group of theories is learner centered (i.e., self-directed learning). Self-directed learning relates to adults who are planning, conducting, and evaluating their own learning. However, Norman (1999) and Hoban et. al. (2005) implied that it really should be “directed self-learning” instead of “self-directed learning” for students. Directed self-learning, which inspires students to take more responsibility in their own learning, could encourage students to become life-long learners as recommended by various professional accounting organizations.

Parts of both the Instrumental Learning Theories and the Humanistic Theories are assimilated in the Problem-Based Learning (PBL) teaching approach. PBL is student/learner centered and involves directed self-learning (i.e., Humanistic Theories). PBL blends the Cognitive Theory by having students use their existing knowledge when they identify what still needs to be acquired or learned and the Experiential Theory when the instructor organizes the students experience to create the desired learning experience (i.e., Instrumental Learning Theories).

PROBLEM-BASED LEARNING (PBL)

Problem-Based Learning summarizes the principles that learning develops from cognitive and social interactions in problem centered situations (e.g., Evensen and Hmelo 2000; Savery and Duffy 2001). Bates *et. al.* (2013) specified that PBL results in students becoming active learners in their learning and not just passive recipients of information. This is exactly what the Accounting Education Change Commission [AECC] (1990) previously recommended.

Under the PBL approach according to Boud (1985), the starting point for learning is a problem or query that the students seek to solve. The concept is that students as they work on solving the

problem will have to identify and search for the knowledge needed in order to endeavor to solve the problem. Bates *et. al.* (2013) suggested that the crucial factors to achieve the desired learning objectives is to understand how the learning process works and their roles in this process for both the students and faculty.

Educator's Responsibilities

In order to expedite learning using the PBL approach, educators need to (1) create the desired learning experience (e.g., project, case, module), (2) facilitate students access to the experience, (3) organize the experience and (4) provide feedback and assessment. In developing the project/case to use in the PBL approach, Wiggins and McTighe (1998) recommended using a process called the "Backward Design" (i.e., outcome-based approach). Under this technique, the starting point is to determine the desired learning goal(s) of the case/project (e.g., starting with the accounting profession's learning objectives/elements).

Student's Responsibilities

As previously mentioned, students should know their role in a PBL exercise. Taylor and Hamdy (2013) implied that students while doing their PBL project should (1) expect to have to perform some searching for needed information, (2) expect to be mentally challenged, (3) construct new knowledge, and (4) hopefully have their perception, views, and beliefs changed.

What are the benefits of utilizing the PBL approach? Allen (1992) stated that this approach promotes the acquisition of generic or soft competences (e.g., communication, teamwork). These competencies are essential skills according to the Pathways Commission, CGMA, and the AICPA. Also, the PBL approach should allow students to activate previous learning while permitting them to incorporate or link the new knowledge with their prior learning.

PBL Continuum of Approaches

Davis and Harden (2009) have implied that PBL is not solely one approach but rather a continuum of approaches to be used in teaching (e.g., problem-assisted learning, problem-centered learning, problem-based learning). A PBL approach could be selected to assist students in developing their accounting reasoning process, which is expected by the Pathways Commission (2015), CGMA (2019), IFAC (2019), and the AICPA (2019 and 1999). Harden and Davis (1998) discussed the various PBL approaches based on the relationship between a scenario/problem and the learning that can be derived from studying that problem. These authors developed an eleven-step continuum between the problem and expected learning experience by the students (e.g., theoretical learning, task-based learning).

TEAM-BASED LEARNING (TBL)

Parmelee *et. al.* (2012), indicated that TBL involves active learning, which is learner-centered, that holds students accountable for preparation (e.g., locate applicable FASB ASC primary sources) and engagement in group activities (e.g., discussion related to the team response) and expects students to use knowledge acquired to solve authentic or realistic problems, make decisions, and communicate conclusions. These skills are what the accounting profession has been desiring. That is, students entering the profession should be able to work on teams to solve problems, make business decisions, and present the conclusions clearly to the intended audience (e.g., oral presentation, written report,

business letter) according to the AICPA (2019), CPA Vision Project (2017), Pathways Commission (2015), IFAC (2019), and CGMA (2019).

Like PBL, the “Backward Design” recommended by Wiggins and McTighe (1998) could be used to locate or create the TBL problem, project, or case. The Pathways Commission Learning Objectives (2015), the CGMA Framework Knowledge Areas (2019), the AICPA Framework Core Competencies (2019), and/or the IFAC’s IES3 Professional Skills (2019) can be the source(s) for the specific learning goal(s) to be used in developing the TBL approach.

TBL along with several of the eleven PBL steps can be used to achieve the specific desired learning objectives for a course over various times during a semester. Next, the authors will discuss how they have implemented PBL and TBL in teaching accounting courses (e.g., Intermediate Accounting I, Tax I, Financial Accounting).

TEACHING USING PROBLEM-BASED LEARNING

To incorporate several of the Pathways Commission’s Learning Objectives (2015), CGMA Framework Knowledge Areas (2019), IFAC’s IES3 Professional Skills (2019), and the AICPA Framework Core Competencies (2019 and 1999 versions) into student learning experiences, the authors have utilized several of the continuum PBL approaches and TBL project in teaching Intermediate Accounting I and Income Taxation courses. The continuum of PBL approaches and the TBL project that have been successfully employed in teaching Intermediate Accounting I at several universities (e.g., large urban, regional state, small state) in different regions of the country (e.g., Illinois, Colorado, Texas) are presented below.

Problem-Assisted Learning Approach

During the first day of the Intermediate Accounting I class, students are introduced to PBL by using the Harden and Davis (1998) “problem-assisted learning approach.” To start the class, the educator uses PowerPoints for about ten minutes to introduce the students to selected financial accounting vocabulary and professional accounting information (e.g., FASB ASC) that they will need to utilize in preparing their first homework assignment.

Immediately after the PowerPoint presentation, the educator uses a multifaceted textbook problem to assist the students first in determining keywords or features in the problem situation that may be useful in answering the questions (e.g., accounting assumptions, measurement, recognition). After emphasizing the keywords in the problem, the educator asks the students what accounting assumption or recognition rule may apply to the situation (e.g., materiality). Then, the students are asked to discuss with neighboring classmates what they think is the answer(s) considering facts stated in the particular situation. Finally, a volunteer is asked to give their conclusion and the reasoning for the answer(s).

This approach is utilized each time to introduce the students to new topics in the next chapter in the textbook. Further, during the first-class session, the students are informed that they will be held responsible to read the chapter for the next class period along with preparing the assigned homework problems including justification for their answers.

Problem-Solving Learning Approach

During the second-class session, the educator introduces the students to the next step in the Harden and Davis (1998) PBL continuum (i.e., “problem-solving learning”). Under this approach, the students orally present their justification or reasoning along with the calculation procedure for each problem/situation to their classmates. This permits the students under friendly conditions to start to improve their oral communication as recommended by the AICPA (2019), CPA Vision Project (2017), Pathways Commission (2015), IFAC (2019), and CGMA (2019).

In the situation where a classmate does not agree with the answer, this permits an investigation of which classmate has the better reasoning or calculation for the situation presented. The class discussion also permits the educator to expand on the topic(s) if necessary. The problem-centered learning approach is used for most class periods during the semester.

Problem-Centered Learning Approach

During the second week of class, students are assigned a project that involves the Problem-Centered Learning Approach. This project should refresh the students’ knowledge of an accounting cycle problem. This project takes several weeks outside of class to complete. The students were encouraged to work in groups on this project. However, each student had to complete and turn in their own project.

Since many of the students at the research universities transferred from two-year colleges (i.e., five different two-year colleges at one university) and international colleges (i.e., from China to Mexico), this project was designed to refresh the students’ knowledge of the accounting cycle. Therefore, this project was designed to be sure that the students have some basic knowledge of accounting before tackling more complex intermediate accounting topics.

Problem-Centered Discovery Approach

Because of the complexity of the topic to be taught (e.g., cash flow statement), the problem-centered discovery approach is applied. For this class day, the educator could utilize an instructor-prepared checklist along with a complex textbook problem in class to assist the students to discover and organize this complex topic (e.g., cash flows from operating activities).

Under the problem centered discovery learning approach, the students by using the checklist should discover the cash flow classification for each transaction/situation. Then, the students should use this checklist to discover (i.e., determine) the classification treatment (i.e., increase or decrease in cash flows) for the specific transaction before the transactions’ information data is entered in the appropriate classification (e.g., operating activities, financing activities) of the cash flow statement. After all the transactions have been entered under the appropriate classification (e.g., investing activities) as an increase or decrease, the students can discover how the sum of all the transactions under each classification affect cash flows. Finally, the students can discover after netting the various cash flow categories that the ending cash balance on the Cash Flow Statement is the same dollar amount balance as in the ledger Cash account.

Problem-Based Learning Approach

In the PBL approach the students start with the problem, case, or project and then they begin to pinpoint and search for the knowledge needed to be learned in order to attempt to solve the problem. While the students are solving the problem, they are also learning knowledge related to that problem. After several weeks into the semester, the students received a short outside of class PBL project (i.e., codification research project), which required about a week to complete. One of the purposes of this project was to have the students learn how to use an accounting data service (e.g., FASB, “Checkpoint”) to find and read primary source data (e.g., FASB Accounting Standards Codification [ASC]).

For this project, the team members needed to (1) identify the problem(s) or terms to be discussed in the scenario, (2) use the professional service to find possible primary source(s) to resolve the issue(s) in the project, and (3) agree on the primary source(s) to be used to support their conclusion(s). Then, each team member was required to write an individual paper (2 to 4 pages) providing (1) answers to a set of questions related to the scenario, (2) citation to support the answer for each question, and (3) keywords used to find the support for each answer.

TEACHING USING TEAM-BASED LEARNING

As discussed earlier, the AICPA (2019), Pathways Commission (2015), IFAC (2019), and CGMA (2019) have all indicated that graduating students should be able to work on teams to solve problems, make business decisions, and present the conclusions clearly to the intended audience (e.g., oral presentation, written report, business letter). However, the several problem-solving learning exercises and the short problem-based learning research project may not be adequate to develop these desirable skills. Therefore, the short problem-based learning research project assignment was used to prepare the students for their work on a longer TBL Project, which will take three to four weeks to complete primarily outside of class.

TBL Project

This TBL Project was designed using the “backward approach” (e.g., starting with the accounting profession’s learning objectives/professional skills/knowledge areas/core competencies). The Project involved financial statement analysis for the two most recent years of annual statements and/or SEC 10-K reports for two companies within the same industry (e.g., Home Depot and Lowe’s) for each team. Each team analyzed a different industry (e.g., hotels, shoe manufacturing, or airlines).

The TBL Project expected each team to (1) obtain each companies’ annual reports and/or SEC 10-K reports for the two most recent years and current year’s sustainability report or statement online, (2) calculate liquidity ratios, solvency ratios, and profitability ratios for the two most recent years, which required them to decide what data should be used to determine each ratio, (3) use the financial statement ratio analysis results as the basis for answering a set of questions, (4) use their companies’ financial statements, notes, code of ethics, sustainability reports to answer another set of questions, (5) prepare the team Project written report including the ratio calculations and the answers to the other sets of questions in the Project, (6) prepare PowerPoint slides for the 15 to 20 minute team presentation to the class, and (7) decide on what each team member will present as each team member must participate in the presentation.

To assure that each student has writing experience, each student was expected to write a one-page individual paper indicating (1) the firm they would select for investment purposes and (2) provide reasoning for their investment conclusion based on the team data developed in the first three parts of the Project requirements. In addition, each student was required to determine individual presentation scores, make peer comments, and sign the peer review evaluation form related to the other teams' student presentations (i.e., perform a peer evaluation). The classmates' presentation scores along with the instructor's score were used to determine each student's presentation points on the Project. When the Project was returned to the students, each student received a Project evaluation form with each Project's component score (e.g., team report, individual presentation, individual report), total Project score and the comments written by their classmates about the presentation (i.e., received a peer review).

RESEARCH METHODS

One of the limitations of educational research that is conducted at only one university is whether the results will apply to other university settings. All of the Intermediate Accounting I classes investigated were taught by one of the researchers at several universities (e.g., large urban, large state, regional state, small state) in different regions of the country (e.g., IL, CO, TX). At several of these universities, English was the second language for 30% to 95% of the students. In addition, at some of these universities, the students were of diverse backgrounds.

The students formed their own teams consisting of 3 to 5 students, which were used for the entire semester. This permitted the students to group together based around family and work responsibility times as 50% – 85% of the students worked. For the TBL Project, each team randomly selected their Project companies.

Peer Review

The IFAC's IES3 (2019) indicated that students should be able to scrutinize their own work through feedback from others. Earlier, the AICPA Framework (1999) indicated that students should objectively respect professional assessment or evaluation by others. Also, according to Schulman (2005), signature pedagogy should provide learning experiences that hold students accountable for their work (e.g., to clients, peers and faculty). Further, Boud *et al.* (2010) suggested that students should learn to make judgments not only about their own work but also the work of others (i.e., perform peer review).

In order to give the students an opportunity to experience peer review, each non-presenting classmate prepared anonymously and confidentially a written evaluation of each team member's presentation and the team's overall presentation using a rubric (i.e., learning to perform peer reviews) with grading characteristics defined on the evaluation form. When the TBL Project was returned, each student received their individual presentation score and peer comments along with their team presentation score and comments (i.e., receiving a peer review).

Assessment

One of the educators' responsibilities in developing PBL or TBL projects/cases is to consider the assessment of that assignment. To accomplish this, Stone and Shelley (1997) and Ramsay *et al.* (2000) used questionnaires/surveys to measure student perceptions of the instructional processes.

Specifically, Chu and Libby (2010) utilized a post-assignment questionnaire/survey to evaluate an active learning assignment (e.g., one-minute writing exercise; PBL).

Therefore, a survey was given to investigate whether the selected accounting profession's learning objectives/professional skills/knowledge areas/core competencies have been achieved. Like the Sawyer *et al.* (2000) study, the survey was given after the students received their TBL Project results (i.e., their grade and assessment form). In this survey, the students were asked to use the 5-point Likert scale (5 = "Strongly Agree") to indicate that the 50+ "expected skills" were achieved during the semester including their TBL Project.

RESULTS

The 5-point Likert scale (5 = Strongly Agree) survey that was given to investigate whether the PBL approaches and the TBL Project accomplished selected accounting professional skills resulted in the following range for some of the skills that the students felt that they had strongly accomplished during the semester:

- Linked data, knowledge, and insights together for decision-making purposes (4.62- 4.36)
- Accessed appropriate electronic databases to obtain decision-supporting information (4.54 - 4.33)
- Built good working relationships (4.54 - 4.30)
- Organized and evaluated information, alternatives, cost/benefits, risks and rewards (4.62 - 4.48)
- Transfers knowledge from one situation to another (4.54 - 4.24)
- Communicates the financial and nonfinancial performance of an organization's operational processes (4.46 - 4.17)

Several of these skills were soft or basic skills that the profession expects the students to have as they start their accounting careers. In fact, many of these skills are those that are difficult to achieve in a typical classroom lecture situation. As a result of the survey, it appears that these Intermediate Accounting I students felt that they had had personal soft skill growth while being taught using various PBL approaches and the TBL Project.

SUMMARY

The AICPA, CGMA, IFAC, and the Pathways Commission have all specified the need for accounting students entering the profession to be able to solve problems, work on teams, do analytical thinking, communicate orally and in writing, show leadership, and make business decisions. The question accounting educators face is how can these learning objectives, knowledge areas, professional skills, and core competencies be integrated into accounting courses (i.e., intermediate accounting, tax, financial accounting)? To accomplish this, adult learning theories were investigated. Parts of both of instrumental and humanistic learning theories were assimilated in the PBL and TBL teaching approaches used in the research.

PBL and TBL are learning techniques that expect students to be actively engaged in a collaborative team or group problem, query, or project, which aspires students to solve. As recommended by the Accounting Education Change Commission [AECC] (1990), students become active learners not passive recipients of information according to Bates *et al.* (2013).

The outcome-based approach (i.e., “Backward Design”) was utilized to develop the suitable PBL or TBL problems/cases/projects. Under this technique, the starting point is to determine the desired learning goal(s) of the problem/case/project (e.g., starting with the accounting profession’s learning objectives/knowledge areas/professional skills/core competencies).

The researchers discussed several PBL approaches (e.g., problem-centered learning, problem-centered discovery learning) and a TBL Project that have been employed at several universities in different regions of the country in teaching Intermediate Accounting I. For each Intermediate Accounting I course section, a survey was administered to investigate whether selected accounting professional skills had been accomplished. The students generally indicated that they “Strongly Agree” or “Agree” that the 50+ selected skills were accomplished during each semester. Many of the skills that the students indicated that they had accomplished are soft skills, which are more difficult to achieve in a normally structured course. The diverse students in the research Intermediate Accounting I classes have indicated that the use of several PBL approaches and TBL Project can result in quite a few desired soft accounting professional skills being accomplished. Some examples of these skills include:

- Describes work performed and conclusions reached in a manner that enhances the reports' usefulness (4.46 - 4.22)
- Evaluates different sources of information and reconciles conflicting or ambiguous data (4.36 - 4.28)
- Objectively considers others' professional criticism or evaluation (4.46 - 4.33)
- Evaluates the significance of evidence or facts (4.25 - 4.18)
- Motivates others to achieve excellence (4.37 - 4.08)

Since there are definitely several PBL approaches that can be easily integrated into Intermediate Accounting I and other accounting courses, why not try using one or two of these approaches next semester?

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