# Blending The Use Of Standards, The Internet And Retesting With The Traditional Method Of Teaching Principles Of Accounting

John E. Elsea, (Email: jeelsea@unco.edu), University of Northern Colorado
John R Stewart, (john.stewart@unco.edu), University of Northern Colorado

**Abstract**

*Every business school has a first accounting principles course required for all its students. Many students do not realize their full potential in this course. What method or methods of instruction will best facilitate learning accounting concepts, principles and applications? Although numerous methods or techniques are used in the classroom today, the traditional lecture method is still very prominent. There does, however, seem to be an increasing emphasis upon the student learning as opposed to the teacher just teaching. Regardless of the instructional method used, it should include as many of the Principles for Good Practice in Undergraduate Education as possible. This article reports the procedures and results of a study comparing an experimental group to a control group taught in the traditional lecture format. The instructional methods in the experimental group incorporated the use of a traditional textbook, lectures, CyberClass web-based self-testing material and flash cards, and a modified standards based approach. Students in both groups were tested at the end of the semester using a comprehensive criterion measure to determine if there was a significant difference in performance. In addition, questionnaires were administered to the experimental group to determine the amount of time spent on the various modules, the effectiveness of CyberClass, and student attitudes toward the instructional methods.*

## Introduction

Every business school has a first accounting principles course required for all its students. The number of students in this course that fail, withdraw, or receive less than a "C" grade is high. If accounting is truly the "language of business" students need to learn this language in an effective and efficient manner.

*Readers with comments or questions are encouraged to contact the authors via e-mail.*

What method or methods of instruction will best facilitate learning accounting concepts, principles and applications? Although numerous methods or techniques are used in the classroom today, the traditional lecture method is still very prominent. Barr and Tagg (1997) see a paradigm shift occurring in American higher education away from the "instruction paradigm" to a "learning paradigm". Under the instruction paradigm, the mission of a college is focused on teaching, whereas under the learning paradigm,

emphasis is on whatever approaches work best to prompt learning of specific knowledge by individual students. They point out that the learning paradigm does not prohibit lecturing but makes it one of the methods available to promote appropriate learning.

Regardless of the instructional method used, it should include as many of the Principles for Good Practice in Undergraduate Education as possible. These principles were first published in the AAHE Bulletin in 1987, and stated that good practice: (1) encourages contacts between students and faculty, (2) develops reciprocity and cooperation among students, (3) uses active learning techniques, (4) gives prompt feedback, (5) emphasizes time on task, (6) communicates high expectations, and (7) respects diverse talents and ways of learning (Chickering and Ehrman, 1999). In addition to acknowledging the importance of these principles, Griffith (1996) also believes that reaching a standard is what is critical, not how quickly it is reached. Significant developments in information and communication technologies such as web sites, chat rooms, and e-mail have become common since 1987 and can be utilized in a manner compatible with the seven principles.

Although a review of the literature did not reveal any research similar to the authors' study, numerous articles were found relating to courses and programs being offered using online technology and/or distance learning. Guernsey (1998) described a Principles of Accounting Course offered on the web, Bisman (1996) discussed the distance education courses in accounting offered by Charles Sturt University, and Uliss (1999) offers accounting course sections over the web that mirror classroom sections as closely as possible. Blakesley and Zahn (1993) deliver complete courses using telecommunications, Falk (1997) described how to incorporate the general rules of problem solving into developing a web-based independent study course, and Burke (1998) discussed the tools that are available for online courses. Hamilton College (Anonymous, 1999) uses CyberClass to deliver its course offerings through the web. The authors also used CyberClass which includes web-based self-testing material and flash cards for this study.

## Methodology

This article reports the procedures and results of a study comparing an experimental group to a control group taught in the traditional lecture format. The instructional methods in the experimental group incorporated the use of a traditional textbook, lectures, CyberClass, and a modified standards based approach. Students in both groups were tested at the end of the semester using a comprehensive criterion measure to determine if there was a significant difference in performance. In addition, questionnaires were administered to the experimental group to determine the amount of time spent on the various units, the effectiveness of CyberClass, and student attitudes toward the instructional methods.

### *Pilot Study*

Material used in this study was tested and developed on a trial basis with a small group of students during the spring 1998 semester. The intention was to refine the material and deliver it to a larger group during the fall semester, 1998.

### *Research Study*

During the fall Semester, 1998, one instructor taught two sections of Principles of Accounting I, a control group and an experimental group. Another instructor prepared and managed the materials on the web. It was impossible to randomly assign students to the sections because students registered for classes on a first come first served basis. Therefore, the control and experimental treatments were randomly assigned to the intact groups.

Both groups used the same textbook, *Accounting – Concepts and Applications* (Skousen,

Albrecht and Stice, 1996), as the basic course material. Exercises, problems, and hard copy test materials were developed from this book. To emphasize the different treatments applied to the groups, the term "testing period" is associated with the control group and "module" is associated with the experimental group. The course was divided into three testing periods/modules. Each testing period/module was designed to be completed in five weeks thus corresponding to a 15-week semester. All unit tests were multiple-choice tests consisting of conceptual and problem questions. The criterion measure was a comprehensive multiple-choice final examination administered to both groups at the end of the semester. Both groups had only one opportunity to complete this examination.

The control group was taught in the traditional manner by listening to lectures, discussing the material, and completing the exercises and problems assigned. They completed one instructor prepared hard copy examination over the material at the end of each five-week period and then moved on to the next five-week testing period.

Students in the experimental group completed the material at an accelerated pace, in four weeks. During the four-week period they also listened to lectures and discussed the material but completed fewer exercises and problems than the control group. In addition they had access to CyberClass, Southwestern Publishing Company's web based self-testing material (HyperGraphics, 1999). Students were encouraged to use this material but other than completing and submitting their answers to an ethics essay case, were not required to use it.

Web based remedial material was prepared in conjunction with Southwestern Publishing Company and CyberClass. The course syllabus was posted on the web site along with assignments, review tests, and an ethics essay case for each module. The use of CyberClass allowed the web based material to be customized and run on HyperGraphics servers, thus enhancing the traditional approach to teaching the course. It allowed on-line communication between the instructor and students. Review tests were prepared from the content material provided in CyberClass for the Skousen text. These tests were scored automatically with notification of the results immediately provided to the student and instructor. In addition, the instructor could correct questions and notify the students of their results. The review tests contained multiple choice problems and true/false questions based on the Skousen textbook. Students could take and submit a review test as many times as they wanted and receive immediate feedback that a question was answered correctly or incorrectly. When students completed and submitted a review test, the program automatically reported the results to the instructor allowing student progress to be tracked. This information was used to determine student usage but was not used to determine student grades or whether they answered the questions correctly. Each module contained one ethics essay case that could only be answered and submitted once; it was required for grading. Additionally, the CyberClass material included a flash card function that allowed the student to practice answering questions with immediate feedback after each question.

Students in the experimental group took a hard copy, instructor prepared test at the end of the fourth week. This was the same exam administered to the control group at the end of the fifth week. An acceptable score on this test was considered to be 80% correct answers. Students achieving this standard were not required to take the retest. Students not achieving the standard were required to review during the fifth week using the textbook, and CyberClass materials. Test results were reported to the students; however, they were not allowed to see the exams. Instead, they were referred to the section in the textbook for each question missed. Only one retest was allowed for the experimental group. Students were then required to start the next module so the course could be completed within

the semester. The final test score for each student for each module was the average of the two tests.

A questionnaire was administered to the experimental group upon completion of each module to determine the amount of time spent on the various course materials provided and the perceived benefit of the materials to the students. Upon completion of the course, students in the experimental group were given a short five point Likert scale questionnaire to evaluate the treatment method.

**Equality of the Groups**

As specified earlier, the treatment was randomly assigned to two intact class sections. Both sections met on Monday, Wednesday, and Friday. The control group met from 11:15 to 12:05, and the experimental group met from 12:20 to 1:10. Forty-one students originally enrolled in the control group and 42 in the experimental group. The control group consisted of 31 males and 10 females; the experimental group contained 26 males and 16 females.

An effort was made to determine if there was a difference between the two groups based upon standardized measurements used for admission to the University. Most students are admitted to the University based upon their Colorado Commission of Higher Education (CCHE) Academic Index score. However, some are admitted based on standardized test scores only. The CCHE index is calculated using a combination of a high school performance index and a standardized test index. Some students had SAT test scores and many had ACT test scores. Since each score was not available for each student, Table I reports the three different measurements by group for all students who enrolled in the two classes. Table II reports the three different measurements by group for only those students who completed the course.

**Results**

*Examination Scores*

Thirty students out of forty-one completed the course in the control group. Thirty-two students out of forty-two completed the course in the experimental group.

To determine the effect of the experimental treatment on achievement, the three testing period/module exams and the criterion measure score were analyzed using a t-test. Table III reports the mean scores on these tests for both groups. T1, T2, and T3 are the initial test results on the three testing periods/modules for both groups. These examinations were administered at the end of the fourth week to the ex-

**Table I**
Standardized Measures for All Students Registered

| Group | ACT | | SAT | | CCHE | |
|---|---|---|---|---|---|---|
| | (n) | Score | (n) | Score | (n) | Score |
| Control | 28 | 21.0 | 8 | 1002.5 | 29 | 94.4 |
| Experimental | 32 | 21.0 | 18 | 1004.4 | 34 | 96.0 |

**Table II**
Scores for students who completed the course

| Group | ACT | | SAT | | CCHE | |
|---|---|---|---|---|---|---|
| | (n) | Score | (n) | Score | (n) | Score |
| Control | 23 | 21.0 | 6 | 1038.3 | 25 | 94.7 |
| Experimental | 28 | 21.2 | 16 | 989.4 | 28 | 97.0 |

perimental group and at the end of the fifth week to the control group. R1, R2, and R3 are the results of the retest for the experimental group taken at the end of the fifth week. In the experimental class, an average of the initial test scores and the retest scores was used for grading purposes. These averages are reported as A1, A2, and A3 on the table. Students in the experimental group scoring above 80% did not have to take the retest, but could if they so desired. If they chose not to take the retest, the initial exam score was used for their average score. The final column on the table contains the mean score achieved on the criterion measure.

The two groups were compared on T1, T2, and T3 using a t-test. The values were .671938, .908355, and .244808 respectively; thus, there was no significant difference at the .05 level. The control group mean exceeded the experimental group mean on T1 and T2. The experimental group mean was greater than the control group mean on T3. In all three cases, the retest results exceed the initial test results for the experimental group.

The two groups were also compared on the comprehensive final examination using a t-test. The calculated value was .029673 and was therefore significant at the .05 level, with the mean of the experimental class exceeding that of the control group.

The two groups were then compared using only the students who completed the course and also had a CCHE index number. This resulted in a control group of 25 students and an experimental group of 28 students. An analysis of T1, T2, T3 and the comprehensive final examination mean scores revealed t-test values of .943, .949, .268 and .034 respectively. These results are consistent with the larger groups.

*Amount of Time Spent and Evaluation of the Course Material by the Experimental Group*

A questionnaire was administered to the experimental group after completing each module to determine the amount of time spent on the course material and its perceived importance. A five point Likert scale was used for rating purposes. See tables IV through VII for the results. The ratings on the Likert scale were: 1 = unimportant, 2 = somewhat unimportant, 3 = no opinion, 4 = somewhat important, and 5 = important. During the first four weeks of each module, students had the Skousen textbook and the CyberClass website material available. During the fifth week of each module, lab sessions using the CyberClass material were available.

In all of the modules, both in weeks one through four and week five, the textbook was the most heavily used resource. This was followed by the CyberClass website material. Students did consistently perceive the textbook to be important and the website material to be somewhat important.

*Comparison of Scores on the Exit Questionnaire*

When the final examination was completed, the students in the experimental group were asked to complete a questionnaire to help evaluate the treatment method and the CyberClass material. The questionnaire contained 10 questions with responses on a Likert scale of: 1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree and 5 = Strongly Agree. There

**Table III**
Test Results for Students Who Completed the Course

| Group | T1 | R1 | A1 | T2 | R2 | A2 | T3 | R3 | A3 | Final |
|---|---|---|---|---|---|---|---|---|---|---|
| Control | 67.8 | NA | NA | 59.0 | NA | NA | 53.1 | NA | NA | 62.4 |
| Experimental | 66.4 | 68.3 | 68.1 | 58.6 | 68.0 | 63.5 | 57.2 | 61.1 | 60.3 | 70.0 |

**Table IV**
Module 1 Weeks 1 - 5

| Material | N | Avg Hrs | N | Rating |
|---|---|---|---|---|
| **Weeks 1 - 4** | | | | |
| Text | 33 | 10.0 | 34 | 4.7 |
| CyberClass Website | 33 | 3.9 | 34 | 4.0 |
| **Week 5** | | | | |
| Text | 30 | 4.0 | 31 | 4.6 |
| CyberClass Website | 30 | 3.2 | 31 | 4.4 |

**Table V**
Module 2 Weeks 6 - 10

| Material | N | Avg Hrs | N | Rating |
|---|---|---|---|---|
| **Weeks 6 - 9** | | | | |
| Text | 26 | 10.4 | 27 | 4.7 |
| CyberClass Website | 26 | 4.0 | 27 | 3.3 |
| **Week 10** | | | | |
| Text | 24 | 5.0 | 25 | 4.6 |
| CyberClass Website | 25 | 2.8 | 26 | 3.5 |

**Table VI**
Module 3 Weeks 11 - 15

| Material | N | Avg Hrs | N | Rating |
|---|---|---|---|---|
| **Weeks 11 - 14** | | | | |
| Text | 30 | 12.3 | 32 | 4.8 |
| CyberClass Website | 30 | 3.8 | 32 | 3.8 |
| **Week 15** | | | | |
| Text | 29 | 8.7 | 31 | 4.7 |
| CyberClass Website | 28 | 4.6 | 31 | 3.8 |

**Table VII**
All Modules Combined Weeks 1 - 15

| Material | N | Avg Hrs | N | Rating |
|---|---|---|---|---|
| **Weeks 1 - 15** | | | | |
| Text | 89 | 10.9 | 93 | 4.8 |
| CyberClass Website | 89 | 3.9 | 93 | 3.7 |
| **Week 15** | | | | |
| Text | 83 | 5.9 | 87 | 4.7 |
| CyberClass Website | 83 | 3.5 | 88 | 3.9 |

was also a response choice of NA for not applicable. Questionnaire results are displayed in Table VIII.

In general students agreed that they:

- preferred the method of instruction used in this course to the traditional method of instruction.
- liked being retested over the material if they did not receive at least 80% on the first exam.
- believed the CyberClass practice exams were helpful.
- liked using the CyberClass message function for submitting ethics case answers.

- liked having the instructor's course outline available through CyberClass.
- liked receiving a study guide report indicating the sections in the text that covered the material in the review tests and fourth week examination questions.

They did not like covering the material at a faster pace initially, and they weakly agreed that the method of instruction motivated them to study.

In a second part of the questionnaire, 59% of the students indicated they studied harder in each module for the retest than they did for the initial examination. Twenty-five percent indicated they studied harder for the initial examination. Sixteen percent believed they spent about the same amount of time on both.

**Observations**

In addition to the responses of the students on the questionnaire, the instructor had the following observations regarding the experimental procedures:

- Even though a variety of materials were available to the students, they still relied most heavily on the traditional material and lectures.
- Just making the materials available for self-improvement does not necessarily mean students will be motivated to use them.
- There seems to be a tendency for the students to procrastinate regardless of the teaching method used.
- Students worked in a computer lab during regular class time for the review week. This seemed to encourage cooperation among students.
- Averaging the initial test score and the retest score for grading purposes caused the students to study harder for both the initial test and the retest because they realized the two grades would be averaged. This, along with the 80 % standard, conveyed high expectations.
- Allowing the students only one retest is possibly not enough. If they were required to review and retest until a predetermined 80 % level of achievement was attained, they might put forth more effort.
- Some students were motivated to achieve an acceptable score on the initial test so they could have a break during the review week.
- It was easier to focus on the Principles for Good Practice in Undergraduate Education using the experimental method. The experimental method did:
- encourage contact between students and faculty.
- develop reciprocity and cooperation among students.
- use active learning techniques.
- gave prompt feedback.
- emphasize time on task.
- communicate high expectations.
- respect diverse talents and ways of learning.

**Table VIII**
Experimental Group Questionnaire After Final Examination

| Question | N | Rating |
|---|---|---|
| I would prefer the method of instruction used in this course to the traditional method. | 32 | 3.6 |
| I liked covering the material at a faster pace. | 32 | 2.2 |
| I liked being retested over the material if I did not receive at least 80% on the first exam. | 32 | 4.3 |
| I believe the CyberClass exams were helpful. | 32 | 4.0 |
| I believe the CyberClass flash cards were helpful. | 27 | 3.4 |
| I believe the CyberClass message function for submitting my ethics case answers was helpful. | 32 | 4.1 |
| The method of instruction used in this course motivated me to study. | 32 | 3.5 |
| I liked having the instructor's course outline available through CyberClass. | 30 | 4.0 |
| Receiving a report after examinations on the sections of the text from which questions were taken helped me focus on my weak areas. | 32 | 3.8 |

## Recommendation for Additional Research

It is recommended that additional research be completed that investigates a more stringent standards based approach that would not allow students to advance to a new module without having achieved a satisfactory score on all previous modules. This approach would require that Principles of Accounting courses be scheduled in a flexible manner allowing students to receive credit only at the time they satisfactorily complete the material. The methodology incorporated in this study could be used for an extended period of time.

## Summary

Accounting instruction today appears to be shifting from an "instructional paradigm" to a "learning paradigm". Regardless of the instructional method used, it should include as many of the Principles of Good Practice in Undergraduate Education as possible. The authors developed an instructional method incorporating the use of a traditional textbook, lectures, CyberClass web-based self-testing material and flash cards, and a modified standards based approach. A class taught by this method exceeded the performance of a traditionally taught control group on a comprehensive final examination. Of all the material, the students used the textbook most, and believed it to be the most beneficial. However, they also used the CyberClass material and found it to be somewhat important. In response to a questionnaire, students indicated they preferred the experimental method to the traditional method of instruction and liked many of its features.

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