

# USING A COMPUTER-BASED, INSTRUCTOR-DEVELOPED AUDIT CASE TO IMPROVE LEARNING IN THE AUDITING COURSE: AN EXAMPLE AND STUDENT REACTIONS

**Jane E. Baird, Mankato State University**  
**Leslee Higgins, University of Wisconsin, Green Bay**

## ABSTRACT

*Providing an active-learning environment, improving students' analytical skills, and introducing "real-world" types of experiences into the Accounting classroom are important objectives in higher education today. The use of cases is one means of achieving these objectives. While published practice cases are available for Auditing courses, they are often too extensive and complex for use in the first Auditing course. This paper presents a rationale for using a computer-based, instructor-developed audit case in the first Auditing course. In addition, a description of how one such case was developed is presented, along with student reactions to the use of the case at two different universities. Student responses indicate that the students perceived a learning benefit from completing the case and enjoyed doing the case assignments.*

*[Note: The case described in this paper is available, at no charge, from the first author.]*

## INTRODUCTION

Accounting educators are continually being challenged to meet three pedagogical objectives: (1) to actively involve students in the education process, (2) to develop students' analytical and judgment skills, and (3) to introduce more "real-world" types of activities into the classroom. This challenge is demonstrated in the Accounting Education Change Commission's (AECC) position statement which states that "Students must be active participants in the learning process, not passive recipients of information. They should identify and solve unstructured problems that require the use of multiple information sources. Learning by doing should be emphasized (AECC, 1990, 309)." Several prior studies propose the use of cases in teaching as a means to satisfy these pedagogical objectives (e.g. Campbell, 1985; Campbell & Lewis, 1991; Libby, 1991; Knechel, 1992; Stewart & Dougherty, 1993; McMillan, 1994), but there are few studies documenting results of case usage. Accordingly, Stout and Rebele (1996) state that the research agenda for accounting education should include additional studies documenting both affective and cognitive changes in students when cases are used in a variety of accounting courses. This paper presents an argument for using a customized instructor-developed practice case in the first Auditing course and documents student reactions to the use of such a case at two Midwestern state universities.

## BACKGROUND

The use of cases actively involves students in the learning process by bridging the gap between the theoretical concepts discussed in the text and actual practical experience. Cases also provide students practice in solving unstructured problems. Libby (1991) and Stewart and Dougherty (1993) cite various benefits of the case approach. These benefits include:

- increased student motivation
- increased student interest in the course topics
- development of students' confidence in their capabilities
- development of oral and written communication skills
- improvement of problem-solving and judgment skills
- increased understanding of course material and of the real world, and
- development of the ability to deal with ambiguity.

Given these arguments, there is surprisingly little published evidence regarding learning benefits achieved from the use of cases. The extant studies report that the use of cases improved learning in some circumstances in Tax courses (Anderson et al., 1990 and Anderson et al., 1989), in a Cost Accounting course (Stewart & Dougherty, 1993), in introductory Management Accounting (Pointer & Ljungdahl, 1973), and in a graduate business course (Bocker, 1987). Additionally, there are two published studies documenting positive results from using case-type activities to teach Auditing. Mohrweis (1993) reported increased learning of audit planning and risk-assessment processes as a result of using multi-media case-type activities in an Auditing course. Innes and Mitchell (1981) found that the use of cases helps improve audit judgment in new accounting firm hires by providing a surrogate for practical experiences. In this way, the development of audit judgment can be accomplished, to some degree, by using cases in teaching Auditing. Although limited, these studies do suggest that the use of cases can result in improved learning.

Any pedagogical reform should consider the most effective and efficient approaches to meeting desired learning objectives. Thus, these factors should be considered both in the decision to use cases and in the selection of case materials. Shorter case activities, such as instructor-developed computer-based cases, can provide an efficient and effective means to teach the specific course objectives for a beginning Auditing course. Using cases in a beginning Auditing course can improve the effectiveness of the course by introducing students to a realistic representation of the audit process, developing the students' judgment processes in the evaluation of risk and resolution of audit issues, and requiring the students to integrate Auditing and Financial Accounting knowledge.

Practice cases, as opposed to situational cases, provide students with hands-on experience with audit tasks. However, many of the published practice cases can be quite comprehensive; this is an advantage in an advanced Auditing course, but can be overwhelming in a beginning Auditing course. In contrast, the instructor-developed case can be tailored to include assignments emphasizing audit procedures covered by the instructor within the time constraints desired. In this way, such cases represent a more efficient way for students to learn the desired material.

Instructor-developed computer-based cases, in particular, have additional advantages. These cases can be prepared at almost no cost to students, thus avoiding the cost of purchasing a published case. An instructor-developed case can represent industries that are typical of clients in the immediate geographical area of the university, which can serve to heighten student interest in the case.

Computer-based cases offer additional advantages over manual cases. For the students, computer-based cases offer an additional opportunity to improve their computer skills. For the instructor, an advantage is that the case can easily be modified from term to term to reduce problems with the sharing of information among students without having to use a completely different case. This paper provides an example of the development of one such case as an illustration for instructors who want to develop similar cases.

### CASE DEVELOPMENT: AN EXAMPLE

The practice case was based on a hypothetical company in the small household electrical appliance manufacturing industry. A brief background of the company was constructed for the case by one of the instructors, and included the types of general information auditors would obtain, such as types of products, customer base, sales volume, ownership, and audit history. The company's financial statements for the current year (unaudited) and prior year (audited) were created by using industry averages for the appropriate industry code. Initial dollar values for sales and total assets were chosen to approximate a medium-sized company within that industry. Initial individual financial statement line-item amounts were calculated to approximate industry average percentages of sales and total assets, while some specific line items were manipulated to create unusual balances for purposes of the audit case.

An audit planning memorandum was written describing the company's control environment and overall risks. This memorandum also indicated the planned audit strategy and the initial established materiality levels. A detailed internal control procedures memorandum was written for the revenue transaction cycle, using the AICPA Audit and Accounting Manual's control checklist as a guide. The planning documentation and financial information was reviewed by audit managers from one of the big six firms to ensure that the information was realistic and internally consistent.

The specific assignments were designed to provide a limited exposure to audit planning procedures and hands-on practice with substantive procedures discussed in the course. Tests of controls could also be incorporated but were not included in the initial case assignments. Instead, the students were provided with a brief summary of the results of control tests in the revenue transaction cycle. All financial information and workpapers were contained in a Microsoft Excel Workbook file, and all documents were in Microsoft Word for Windows. Each student was provided with a disk containing all the necessary files, including an instructions file. Seven assignments were required and are briefly described below:

(1) Analytical Procedures. Students were first asked to review the client background information, the planning documentation, and the financial data. They were instructed to calculate selected ratios on the trial balance worksheet and prepare common-sized financial statements by copying prior year formulas on the trial balance worksheet. The students were to use this information to identify any unusual items they felt might require additional audit attention.

(2) Risk Assessment. Students were provided with a risk analysis spreadsheet as part of the Excel Workbook file. In order to limit the time required to complete this assignment, four accounts were selected: Sales Revenue, Accounts Receivable, Allowance for Doubtful Accounts, and Warranty Expense. These accounts were chosen to represent both routine transactions and accounting estimates. The four accounts, their balances, and the financial statement assertions (as

defined in the auditing standards) for each of the accounts were listed on the spreadsheet. The students were instructed to use the information provided in the case, as well as their results from the first assignment, to assess inherent risk and control risk for each financial statement assertion. The audit risk model formula ( $\text{Audit Risk} = \text{Inherent Risk} \times \text{Control Risk} \times \text{Detection Risk}$ ) was entered into the spreadsheet by the students to calculate detection risk for each assertion. The students answered questions regarding which assertions would require the most effort and which would require the least effort, based on their detection risk results. The students were told there were no “right” answers to the risk assessments, but that their explanations should be consistent with their risk assessments.

(3) Accounts Receivable. A spreadsheet presenting a detailed listing of Accounts Receivable balances was included in the Excel Workbook file. In addition, a Word file containing Accounts Receivable confirmation replies was included in the case materials. These confirmation replies were created to match a sample of the customers, with some clean replies (customer agreed with client), some exceptions, and some nonreplies. Students were required to complete the analysis of the receivables and identify potential adjustments.

(4) Sales Cutoff. A sales cutoff worksheet was included in the case materials. The items included several sales properly recorded, as well as some which were recorded in the wrong period. Students were asked to review the listing and identify necessary adjustments.

(5) Search for Unrecorded Liabilities. One of the workbook spreadsheets contained a list of cash disbursements after the client’s year end. The case also included a Word file containing vendor invoices supporting the disbursements. These invoices were created using the Microsoft Word invoice templates. Some of the invoices were purposely created to relate to the year under audit, while some were the next year’s transactions. The students were provided with a list of the disbursements which were already recorded as liabilities at the client’s year end. They were then required to verify the items in the spreadsheet list against the invoices, determine which year the invoice should have been recorded in, and propose any necessary adjustments.

(6) Warranty Liability. This account was included to give students some exposure to issues surrounding the audit of an estimate. A worksheet containing the calculation of warranty liability for the current year end was included in the workbook. Students were asked to determine if any adjustment to the account was needed, comment on the reasonableness of the method used to calculate the estimate, and comment on additional work which should have been performed on the warranty account.

(7) Cash Account. The case included a bank reconciliation spreadsheet, a Word file containing a standard bank confirmation reply, and information as to checks and deposits listed on the cutoff bank statement. Students were asked to complete the audit of this cash account by performing such procedures as verifying the balance per bank against the confirmation reply, and to propose any necessary adjustments.

The case was used in the beginning required Auditing course at two state universities; one on a quarter system, the other on a semester schedule. The instructors at both schools used the same course objectives, so the case was appropriate for use at both institutions without modification. The assignments were completed by the students outside of class after the related material was covered in the course. Students received grades for the assignments based on the completeness and correctness of their work.

At the end of the term, the students were asked to complete an anonymous evaluation of the case project. The evaluation included Likert-scale ratings of the usefulness of the case overall and of each assignment separately, in terms of helping the student learn the Auditing material. The possible responses ranged from one (not at all helpful) to 10 (extremely helpful). In addition, the students were asked to indicate how much they enjoyed doing the case activities, using a 10-point Likert scale ranging from one (not at all) to 10 (very much). Additionally, students were asked to indicate the total amount of time they spent on the case activities and to provide written comments as to what they liked most and least about the case.

### STUDENT REACTIONS

The case was completed and evaluated by 45 accounting seniors at two different state universities (19 students at one university, 26 at the other). The responses overall indicate that the students believed the case exercises helped them learn about Auditing. Mean responses for all students are presented in Table 1. The mean rating for the overall usefulness of the case was 7.38 (on a 10-point scale), indicating a moderately high level of perceived overall usefulness. The results for the individual assignments were similar, with the mean responses ranging from 6.79 to 8.00. The students reported only slightly lower ratings in terms of how much they enjoyed doing the exercises (mean = 6.66). As the minimum and maximum ratings indicate, not all students were equally satisfied with the assignments, but they all indicated that the case helped them learn.

Assignment Rated	Mean Rating	Standard Deviation	Minimum Rating	Maximum Rating
Analytical Procedures	7.47	1.39	5.0	10.0
Risk Assessment	6.81	2.14	1.0	10.0
Accounts Receivable	7.82	1.28	5.0	10.0
Sales Cutoff	8.00	1.49	3.0	10.0
Unrecorded Liabilities	7.64	1.60	3.0	10.0
Warranty Expense	6.79	1.67	3.0	10.0
Bank Reconciliation	7.33	1.76	3.0	10.0
Overall Usefulness	7.38	1.45	3.0	10.0
Overall Enjoyment	6.66	2.13	1.0	10.0
Total Time Spent (Hours)	11.79	5.95	4.0	40.0

One interesting note is that the students appear less happy with the more judgmental assignments such as risk assessment and warranty expense. Written comments on the evaluations indicated that the students were uncomfortable with the uncertainty involved, particularly in regard to risk assessments. This could be considered an argument for including *more* of these types of assignments to better prepare students for the substantial uncertainty and judgment involved in the Auditing profession. In addition, this reaction is not uncommon when case situations are used in

classes. For example, Campbell and Lewis (1991) note that while cases offer a welcome break in classroom routine for students, the students often are intolerant of ambiguity in cases and do not like the fact that there can be multiple solutions to each case-presented problem.

On average, the students spent approximately 12 hours completing all the assignments. The maximum time of 40 hours was reported by one student, who was the only one to report time in excess of 25 hours. The minimum time reported was four hours.

The mean student responses reported at each university are presented in Table 2. The ratings are somewhat comparable, although students at University One rated the assignments slightly higher than their counterparts at University Two. This suggests that the success of such cases may be affected by contextual factors such as the length of the term, the text used, other instructional methods used, the instructor, or the learning styles of the students in any given class.

Table 2 Student Survey Results				
Assignment Rated	Mean Rating	Standard Deviation	Minimum Rating	Maximum Rating
University One Students (n = 19)				
Analytical Procedures	7.84	1.46	5.0	10.0
Risk Assessment	8.16	1.57	4.0	10.0
Accounts Receivable	8.68	0.95	7.0	10.0
Sales Cutoff	8.84	0.96	7.0	10.0
Unrecorded Liabilities	8.58	1.30	5.0	10.0
Warranty Expense	7.11	1.73	4.0	10.0
Bank Reconciliation	7.84	1.71	3.0	10.0
Overall Usefulness	7.95	1.27	6.0	10.0
Overall Enjoyment	7.94	1.39	5.0	10.0
Total Time Spent (Hours)	9.55	3.35	4.0	17.5
University Two Students (n = 26)				
Analytical Procedures	7.19	1.30	5.0	9.0
Risk Assessment	5.83	1.96	1.0	9.0
Accounts Receivable	7.19	1.13	5.0	9.0
Sales Cutoff	7.38	1.53	3.0	10.0
Unrecorded Liabilities	6.96	1.46	3.0	9.0
Warranty Expense	6.56	1.61	3.0	10.0
Bank Reconciliation	6.96	1.73	3.0	10.0
Overall Usefulness	6.96	1.46	3.0	9.0
Overall Enjoyment	5.77	2.12	1.0	9.0
Total Time Spent (Hours)	13.42	6.91	5.0	40.0

The overall usefulness rating assigned by the student is perhaps the most pertinent factor in determining the value of these types of cases. The frequency distribution of the overall usefulness rating is presented in Table 3. The distribution of ratings shows that the majority of students at both universities rated the case in the seven and eight point range. None of the students rated the case's usefulness lower than a three and only two students rated the case lower than a five. These results indicate that the assignments helped every student to some extent, and were highly useful for the majority of the students.

Rating Value	University One			University Two		
	Frequency	Percent	Cumulative Percent	Frequency	Percent	Cumulative Percent
1	0	0.0	0.0	0	0.0	0.0
2	0	0.0	0.0	0	0.0	0.0
3	0	0.0	0.0	1	3.8	3.8
4	0	0.0	0.0	1	3.8	7.7
5	0	0.0	0.0	3	11.5	19.2
6	2	10.5	10.5	1	3.8	23.1
7	6	31.6	41.1	8	30.8	53.8
8	5	26.3	68.4	11	42.3	96.2
9	3	15.8	84.2	1	3.8	100.0
10	3	15.8	100.0	0	0.0	100.0

The written comments provided by the students were quite interesting. Many of the students commented that they liked that the case enabled them to apply the theory and concepts presented in the text in a hands-on, real-life scenario. Several students commented that they liked the reasonable length of the case materials. At the same time, many of the students felt they would have liked to have more information provided, and some students indicated they would even have liked to have more assignments. Examples of the student comments summarize the benefits of practice cases and are as follows:

“It really helped put the book material in focus. It also forced me to do a better job of keeping up in reading the textbook. I appreciated Auditing more.”

“It gave me a chance to apply knowledge from class to an actual case. This also helped give a better understanding of the material.”

“All the information was on one disk and you didn't need pages of information.”

“Looking at actual invoices and confirmations made it seem realistic.”

“It did give me an overall understanding of how the audit process works.”

## CONCLUSIONS AND RECOMMENDATIONS

There is little argument among academicians today as to the value of using hands-on learning techniques such as practice cases. The intent of this paper is not to advocate the use of any particular practice case, but rather to present the argument for using an instructor-developed practice case tailored to the particular course taught. This approach provides an efficient and effective means to meeting the specific learning objectives for a course. While such an approach requires instructor time to develop the case materials and create the specific assignments, the potential rewards in terms of increased student learning can make such efforts worthwhile. The example provided in this paper illustrates that students do perceive substantial benefits from these types of assignments. The willingness of companies to share information for case materials, and the willingness of academicians to share their materials with their peers, can reduce the overall time involved in preparing and adapting such cases for any particular course. Additionally, an individual case can be used repeatedly with minor modifications from term to term.

While there are published practice cases available, many instructors might find them impracticable due to cost constraints for the students or time constraints prohibiting the assignment of lengthy cases. The availability of shorter published practice cases would provide instructors with more alternatives. Developing a customized case for a specific course or set of students is another alternative which allows instructors to tailor the length, complexity, and nature of the assignments to best fit the needs of the students and meet the learning objectives of the courses.

Other factors to consider when developing a practice case include:

- (1) combining an audit case with library work, such as searching for industry averages and/or finding current articles related to events in the company's industry;
- (2) assigning a portion or all of the case activities to be done in small groups rather than individually;
- (3) completing the case assignments as in-class activities rather than homework assignments; and
- (4) utilizing other types of software, such as commercially-available working paper software.

This study examined only students' attitudes about the benefits of case exercises and did not attempt to examine or report actual cognitive learning achieved by the students. Research assessing the learning achieved from the use of cases through use of a pretest-posttest combination, or use of a comparison group not completing the case assignments, would provide meaningful information for Accounting educators. In addition, studies reporting on the comparative efficiency and effectiveness of various types of cases, and of cases as opposed to other teaching methodologies, would provide further insight on the benefits of cases in the Accounting classroom.

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