

The Impact of Interactive Computer-Based Classroom Management Cases on Motivation and Achievement

James A. Reffel, Associate Professor
Department of Psychology & Counseling
Valdosta State University, GA, U.S.A.
jareffel@valdosta.edu

David M. Monetti, Associate Professor
John H. Hummel, Professor
Valdosta State University, GA, U.S.A.

Abstract: The present study sought to determine the impact of interactive cases on achievement and motivation compared to a traditional classroom learning experience. Eighty three students in a required course (i.e., educational psychology) volunteered to participate. Participants in the experimental group were asked to view two interactive cases. Participants were evaluated on their level of motivation / participation, and achievement. Participants also completed some open-ended questions to qualitatively evaluate the effectiveness of the interactive technology. ANOVA revealed significant differences between the experimental and control groups on motivation and all aspects of achievement. Both the quantitative and qualitative data supported the position that students benefited academically and motivationally from their experience with the interactive classroom management case studies.

During the 1980s, when the majority of education faculty were first exposed to personal computers and, later, the wonders of the Internet, many of us were certain that the days of the “little red schoolhouse” were, inevitably, finite (Perelman, 1992). While capital outlays for hardware and software have, even up to the present, delayed the vision of truly electronic-based learning environments, another major hurdle virtually all public school systems will continue to face is making the Internet available in individual classrooms (Smith, 1996). Smith (1996) stated that the ultimate goal of computer-based classes is to teach students how to think and research for themselves, “studies consistently show computers in the classroom, especially ones that help them explore their world, are capable of doing just that” (p. 26).

Woolfolk (1995), Crawl, Kaminsky, and Podell (1997), and Slavin (2003; 1997) have each described and evaluated the types computer assisted instruction (CAI) available to teachers. CAI programs typically fit into five categories: drill and practice, tutorials, instructional games, simulations, and utility programs (e.g., word processing and spreadsheets). Software reflecting the first four categories, usually in the form of CD-ROMs, typically provide what is called interactive learning in that they combine text, sound, film, and video, and require students to interact with the software. According to Slavin (1997), computer-based instruction is, “often effective when it is used in addition to regular classroom instruction; it has smaller and less consistent achievement effects when it entirely replaces classroom instruction” (p. 331). Slavin’s conclusion is shared by Costlow (2000) and Humby (1999). Costlow (2000) cautioned that instead of making broad curricular changes involving interactive learning, “it’s wiser to augment the teaching techniques that were proven effective throughout the past century, not to toss them out and hope the new approaches will yield better results” (Costlow, p. 2). Humby (1999) argued that the traditional model of formal learning, what he terms instructor-driven delivery, has many advantages (flexibility to meet the unique needs of individuals, etc.) that interactive learning precludes.

Humby (1999) found that on the achievement test taken by all the participants, the computer-based interactive learning group's average was 5% points higher than the participants in the traditional group. Humby's (1999) study was designed to test the effectiveness of a training program on starting and managing a small timber business presented to Native adult learners in Canada. The program was taught traditionally to one group of participants, and interactively to a second. The research design imposed artificial limitations on both groups but the interactive group operated under the most severe limitation: time. One of the major strengths of interactive learning is that it provides each student with the opportunity to spend more time with the program than is often available in class. Because all participants had to be assessed at the same time, the interactive participants did not have as long with the program as they would have had in a more natural setting. While the time constraints may have been a limiting factor in Humby's study, in most classroom situations, including those employing interactive learning, there are imposed deadlines by which students are required to demonstrate competency.

Crowl et al. (1997) explained that educators typically adopt one of four approaches to the use of interactive learning in their classes. In the segregated approach, often requiring students to leave the classroom to use a computer lab, the software and curricular objectives are independent, so students learn some content in the class and different content interactively. In the supplementary approach students decide whether to use a particular program that is available either in the classroom or a lab. Integrated use of interactive learning is where use of the software is a formal component of the traditional instruction. Finally, the compensatory approach, viewed by Crowl et. al. mainly for use with disabled students, is designed to help students who are experiencing difficulty mastering the regular curriculum covered in the class. This view, to us, seems too narrow because the compensatory approach dovetails with the supplementary approach if it is available for both remediation and enrichment.

A common thread that ties together both the categories of software employed and the approach adopted by the educator is in the area of individualized instruction. As Bork (1999) stated:

Almost all learning is now at a fixed pace; a "course" is the same length for all students. I believe it was Patricia Cross who said that our present system keeps the time the same and varies the amount of learning but that it should be the other way around. Students should work at a given topic until attaining mastery. Students, with different interests, backgrounds, and learning styles, learn at different rates. Current educational structures make individualized pacing difficult, suggesting that these structures must change drastically. (p. 2)

Bork (1999) believed that to reach its promise, today's interactive learning programs need to become "highly interactive," which involves three factors. First, students engaged with a program need to be active participants. Learners should be required to make simple (e.g., yes/no) and complex responses to embedded prompts at least every 20 seconds. Second, the students' active responding should be, ideally, verbal to more closely approximate the Socratic model. This form of responding leads directly to Bork's final point, which pushes the technology's current boundaries.

A human tutor remembers the learning styles and past problems of students. We can provide a similar facility with the computer, keeping detailed records on student performance and using these records in making decisions about what is next to be presented to the student. (Bork, 1999, p. 3)

Hughes, Packard, and Pearson (1999) examined the achievement of preservice education majors using low, medium, or high levels of an interactive learning program, *Reading Classroom Explorer*. They found that students who used the program at the higher levels had greater awareness of different approaches to teaching and reading than did those who used the program minimally (the resistant group). Benvenuto (1999) found that many college students are extremely resistant to the integrated use of interactive learning because it requires both teachers and students to devote more time and effort to master course objectives. Additionally, Hughes et al. (1999) cautioned that most studies focusing on the effects of interactive learning software do not show whether the skills learned by the participants generalize to their classroom practice, a concern that is true for virtually all content and skills learned at the preservice level in both traditional and interactive learning environments. Unfortunately, as pointed out by Woolfolk (1995), Crowl et al. (1997), and Slavin (1997), not all comparisons between traditional and interactive instruction show that interactive learning is superior.

Flanagan and Black (1997) found that students who were taught a skill directly by a teacher showed greater fluency and generalization of the skill than did those who acquired the skill interactively, though both groups achieved at the same level on a knowledge test over the content. Marszalek and Lockard (1999) found that randomly assigned 7th grade students who were taught frog dissection conventionally had higher achievement than did students who learned interactively, though posttest scores three months later were not as large as the initial posttest scores. Spector (2000) argued that to ensure that students derive the most from interactive learning it is important that teachers “provide traditional tutorial and expository instruction to establish a basic foundation on which to build meaningful activities” (p. 530).

Interactive CD-ROM based computer applications can be effectively utilized in college courses to bolster instruction. However, in order to make effective use of the technology, these learning tools must be appropriately implemented and critically evaluated on key variables (e.g., achievement and motivation). In one system, *Cases in Teacher Education: Classroom Management*, developed by Peter Desberg and Joel Colbert (1995), students have an opportunity to see, hear, and interact with authentic classroom management incidents. For example, one of the highlighted incidents discusses how one should manage the first five minutes of each class period’s allocated time. With this software, students extend the theories and research of educational psychology through the practical experience of analyzing “real-life” situations in an interactive computerized environment.

Novice teachers frequently report that they are most concerned about understanding effective classroom management techniques (Ormrod, 2000). Interactive case studies provide opportunities for students to test their comprehension and application of the research in classroom management. Not only would it give students the opportunity to use technology, but also provide experience and feedback in an area of self-reported need.

This study was conducted for several reasons. First, there is not an extensive literature base of research on interactive educational issues. Next, the present study focused on the effectiveness of interactive cases dealing with classroom management, an area of on-going concern to both practitioners and education majors. Last, we were as concerned with our students’ reflections and perceptions of their use of interactive materials as we were with how these materials affected their achievement.

It was hypothesized that students participating in the CD-ROM experimental group would outperform students in the control group in several achievement domains (e.g. multiple-choice, true/false, short answer, case study analysis, and on an interpretive item). Overall, we

sought to investigate whether an interactive CD-ROM learning program on classroom management integrated with the classroom management chapter and lecture would produce higher achievement and motivation than the traditional coverage of the topic. In addition to achievement differences, it was also hypothesized that students who completed the interactive assignment would report higher degrees of motivation and more positive outcomes in several categories (e.g., enhancing learning, reality based learning).

Method

Participants

Students from three sections of a required course in educational psychology (n=83) volunteered to participate in the study. Fifty seven of the students were assigned to participate using the interactive software and twenty six students were selected to serve as a control group. Sixty-three of the participants were female (76%) and twenty were male (24%). Eighty participants (96%) held class status of junior or higher.

Materials

Participants in the experimental group were asked to view two interactive cases, “Low Five” and “High Five,” from the CD-ROM *Cases in Teacher Education: Classroom Management (1/e)* by Peter Desberg and Joel Colbert

Design and Procedure

“Low Five” and “High Five” interactive video segments were viewed with a worksheet that asked students to consider several questions and to read sections in their course textbook. The questions and readings from the case “Low Five” were as follows:

1. Read section on *engaged time / time-on-task* on page 388 in your textbook (Slavin, 2000). What strategies can you use to get students on task as soon as they enter?
2. Read section on *allocated time* on page 389 in your textbook (Slavin, 2000). What are the consequences of the teacher not monitoring the students?
3. Read section on handling routine procedures on page 391 in your textbook (Slavin, 2000). The teacher’s method of taking attendance takes a great deal of time. How might she do this more efficiently?
4. Read section on *overlapping* on page 396 in your textbook (Slavin, 2000). In what ways does the teacher’s response to Charles make the problem more difficult to resolve? How might she have handled this confrontation differently?

The questions and readings from the case “High Five” were as follows:

1. Read section on *starting out the year right and setting class rules* on page 399 in your textbook (Slavin, 2000). What are some of the ways that the teacher indicated to students what they were expected to do?
2. Read sections on *maintaining momentum, smoothness of instruction, and managing transitions* on pages 392-3 in your textbook (Slavin, 2000). What does the pre-activity accomplish for the teacher?

3. Read sections on *principle of least intervention and prevention* on page 402 in your textbook (Slavin, 2000). What are some appropriate ways for teachers to demonstrate empathy toward students?

After completing the assigned worksheets and cases, students completed a survey used to evaluate their motivation and level of participation, and a formal assessment over the content via written responses to a case study, multiple-choice, true-false, and essay test items. Motivation and participation were assessed with rating items. The participants in the control group completed the typical class unit on classroom management and then responded to the same assessment packet as the experimental group.

Scoring

Rating Scale to Assess Motivation / Participation. A rating scale was developed to assess motivation / participation of both groups. The following questions were used to assess motivation and participation:

- On a scale of one to five, with five being the most positive, how would you rate your learning experience with *Interactive Cases in Teacher Education: Classroom Management*?
- On a scale of one to five, with five being the highest, how would you rate your ability to stay on task (motivation) as a result of using *Interactive Cases in Teacher Education: Classroom Management*?
- On a scale of one to five, with five being the highest, please rate how much influence this activity will have on your future teaching.
- On a scale of one to five, with five being the highest, how would you rate your level of interest in this topic as a result of using *Interactive Cases in Teacher Education: Classroom Management*?
- Please state your level of agreement with the following statement: My learning experience using *Interactive Cases in Teacher Education: Classroom Management* was superior when compared to typical learning experiences.

Achievement Assessments. To assess the participants' level of achievement in the area of classroom management, they answered 16 multiple choice items, 10 true/false items, 4 short answer items, a case study item, and an interpretive item. Sample items in each of the categories are as follows:

- (multiple-choice) In the research on teachers as effective managers, it was found that, in the first days of school, teachers:
 - a) worked with individual students to find their individual strengths and weaknesses.
 - b) worked with the whole class initially.
 - c) broke the class into groups.
 - d) broke the class into high, average, and low achievers.
- (true/false) Overlapping refers to the teacher's ability to attend to interruptions or behavior problems while continuing a lesson or other instructional activity.
- (short answer) What strategies are useful for preventing discipline problems?
- (case study) Following a short description of a classroom situation, students were asked to discuss the probable impact of the teacher's management problems on learning.

- (interpretive item) Following a description of the results of one teacher's responses to a questionnaire about classroom management style. Based on the results of the questionnaire, participants were asked to interpret and discuss the teacher's management abilities.

Finally, participants completed some open-ended questions to qualitatively evaluate the effectiveness of the interactive technology. The following questions were used to gather qualitative data:

- Please list the five most positive aspects of using *Interactive Cases in Teacher Education: Classroom Management* with the most positive listed first.
- Please list the five most negative aspects of using *Interactive Cases in Teacher Education: Classroom Management* with the most negative listed first.

Please offer any additional comments regarding the use of *Interactive Cases in Teacher Education: Classroom Management*.

Results

Achievement and motivation data

An ANOVA analysis of the data revealed significant differences between the experimental and control groups on motivation, $F(1, 77) = 8.88, p < .05$, multiple-choice and true/false achievement, $F(1, 81) = 5.86, p < .05$, short answer achievement on each of the four items, short answer one, $F(1, 81) = 12.55, p < .05$, short answer two, $F(1, 81) = 84.13, p < .05$, short answer three, $F(1, 81) = 72.48, p < .05$, short answer four, $F(1, 81) = 72.48, p < .05$, case study achievement, $F(1, 81) = 78.08, p < .05$, and achievement on the interpretive item, $F(1, 81) = 61.45, p < .05$.

Qualitative data

Additionally, participants in both conditions were given an opportunity to evaluate their respective learning experience vis-à-vis listing the five most positive aspects and five most negative aspects of their experience. Qualitative analyses of the comments are summarized in the Tables 1 and 2.

Table 1: Positive aspects of comments by group and categorized by theme.

Theme: Reality

Group	Comments	Frequency
Experimental	I learned what you should/shouldn't do in various situations.	40
	The software showed "real-life" examples.	34
	The software was very interactive.	11
	The visuals helped me to understand concepts.	6

Control	I learned strategies for reducing misbehavior	6
	I learned about consequences / principle of least intervention.	6

Theme: Enhances

Group	Comments	Frequency
Experimental	The software emphasized the importance of setting rules.	11
	The software provided questions and feedback during exercises.	4
	The software made the book and lectures clearer.	4
	The software helped me "think" reflectively.	2
	It helped me use my reasoning skills.	2

Control	The book and lectures taught me how to change the environment to reduce misbehavior.	8

Theme: Motivation & Engagement

Group	Comments	Frequency
Experimental	The software held my attention.	10
	The software was entertaining and provided interesting scenarios.	5
	Using the technology was a nice change of pace over lectures.	3

Control	There were no comments from the control group for this theme.	

Theme: Cooperative

Group	Comments	Frequency
Experimental	I got to hear opinions of other students and experts.	4
	I liked working with a partner.	3

Control	There were no comments from the control group for this theme.	

Table 2: Negative aspects of comments by group and categorized by theme.

Theme: Confusing

Group	Comments	Frequency
Experimental	There was not enough time; we needed more situations.	16
	The other groups were distracting and noisy.	11

Control	Some of the concepts were difficult to understand.	2
	There was not enough time; we needed more situations.	2

Theme: Redundancy

Group	Comments	Frequency
Experimental	The exercises overlapped too much with previous ones.	15
	The answers were given.	4

Control	There were too many non-examples and I already knew this.	2

Theme: Technology

Group	Comments	Frequency
Experimental	The equipment broke.	7
	The instructions on use weren't always clear.	5
	The volume was poor and the monitors were too small.	4
	I don't like computers.	3

Control	There were no comments from the control group for this theme.	

Theme: Cooperative

Group	Comments	Frequency
Experimental	My partner and I didn't agree on what to do.	2

Control	<i>There were no comments from the control group for this theme.</i>	

Theme: Not Real

Group	Comments	Frequency
Experimental	It seemed staged; it would have been more effective if videos were from a real classroom.	5

Control	The unit was too basic	4

Discussion

It was predicted that there would be significant differences between the experimental group and the control group in the areas of: (a) motivation; (b) multiple-choice and true/false quiz achievement; (c) short answer quiz achievement; (d) case study achievement; and (e) achievement on the interpretive item. Additionally, it was hypothesized that students would report generally positive aspects when using the interactive technology. The results supported the hypotheses of the study. Participants using interactive cases studies reported greater motivation than those in the control group. Additionally, users of interactive cases demonstrated greater achievement than the control group in all of the objectively scored forms of assessment. Strong differences also emerged on the free response assessments (short answer and interpretive items). There were also compelling differences in the response to the handling of the case study item. Thus, it was clear that based on the data from the current sample, the interactive case studies served as an effective tool to help improve student comprehension of classroom management topics. Consequently, the authors recommend using interactive case studies to enhance achievement in the area of classroom management. It is commonly accepted that classroom management skills are critical to the effectiveness of the teacher. However, the question remains concerning the degree to which classroom instruction improves actual classroom management behavior in a real classroom environment. Therefore, further research should address whether or not the benefits of using interactive case studies transfer to effectively managing an actual classroom.

While the quantitative findings of the study are compelling, it was considered important to gather qualitative attitudinal information concerning the efficacy and usefulness of incorporating the computer-based classroom management cases in to pre-service teacher training. The qualitative data revealed several interesting findings.

When asked about the positive aspects of their respective experience, four dominant themes emerged: reality; enhancement; motivation and engagement; and cooperation. One of the most salient findings was that experimental condition participants indicated on 40 occasions that “I learned what you should/shouldn’t do in various classroom situations.” The experimental group also indicated 34 times that the software was valuable because it demonstrated “real-life” examples. The control group indicated 8 times that they found the traditional instruction to be helpful towards teaching them how to change the environment and to reduce misbehavior. The authors found this finding somewhat worthy of note as the above comment appears to support a belief among the control group that a major focus of classroom management is the reduction of misbehavior. Effective classroom management should be more proactive than a focus on reducing misbehavior.

When asked about the negative aspects of their respective experience, five dominant themes emerged: confusing; redundancy; technology; cooperative; and not real. The experimental group’s criticisms focused on not enough time (frequency = 16), the exercises overlapped with previous ones (frequency = 15), the other groups were distracting and noisy (frequency = 11), and the equipment broke (frequency = 7). Fortunately, many of these shortcomings could be prevented in the future. Therefore, instead of conducting this activity during class (where there is a time constraint), students could be allowed to check out the software or by placing the software on computers in a lab with convenient hours. Thus, students would have more time and be less distracted by the noise of other groups. Additionally, as teacher education programs begin to rely more extensively on technology-driven instruction

employing the Internet, CD-ROMs, etc., it behooves us to ensure that such technology produces appropriate levels of achievement, is usable by students in both structured and unstructured settings, and both captures and maintains, to the extent possible, student interest.

While both the quantitative and qualitative data in our study supported the position that our students benefited academically and motivationally from their experience with the interactive classroom management case studies, these data should be viewed conservatively. Our findings may be specific to (a) the students who participated (limited external validity), and/or (b) an outcome of the specific CD-ROM used, rather than to interactive case studies in general. Still, we are encouraged by the study's results especially in view of our belief that greater emphasis on the use of technology is inevitable.

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