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Educational Games Increase Learning Effectiveness: A Case Study

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EDUCATIONAL GAMES INCREASE LEARNING EFFECTIVENESS: A CASE STUDY

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ABSTRACT

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By

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Educators of all age groups—whether they be elementary, secondary, or post-secondary—have long recognized and known that there is a strong connection between student engagement in the learning process and student success. Given the environment in which we teach in today, with its growing diversity, larger class sizes, increased focus on high-stakes testing, and ever-expanding poverty levels, it is essential that teachers incorporate new teaching techniques into their classrooms as a tool for better engaging students in their own learning. To that end, this paper reviews the purported benefits of educational games in the classroom setting as a tool for increasing student interest and motivation in the learning process. It also discusses the process and results of creating an original game designed to test the idea that games can increase learning effectiveness. Through the use of that game, *Knighthood: A Quest*, I discovered that a well designed game can be utilized to motivate students to actively participate in the learning process, and that such games are valid replacement options for traditional "skill and drill" exercises used for review of information.

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CHAPTER ONE

BACKGROUD OF THE PROJECT

> Play is a very serious matter . . . . It is an expression of our creativity; and creativity is at the very root of our ability to learn, to cope, and to become whatever may be (Rogers & Sharapan, 1994, p.1).

After years in the educational television industry, Fred Rogers, of "Mr. Rogers' Neighborhood" fame, learned a lot about children and play. In fact, one of the main principles of his show is that by allowing children to use play as a learning tool, children became more interested and motivated in learning. This is a teaching tenet that educators in all areas and age-groups of education have long since known and understood: When learning is fun, students are more willing, interested, and motivated to engage in the educational process, and thus are more likely to find success (McKeachie, 2002; Jensen, 1998; Cashin, 1979).

STATEMENT OF THE PROBLEM

With the evolving population of students, whether it is increased diversity, changes in socio-economic status, or the realities of the changing nuclear family, teachers are finding it even more important than ever to develop new teaching techniques to better engage students. In order to meet their needs and increase

learning effectiveness, students must engage with their learning, and one technique is to utilize educational games within the classroom.

PURPOSE OF THE PROJECT

The purpose of this project was to explore the learning effectiveness of students by utilizing an educational game as a teaching tool. To this end, an original game, *Knighthood: A Quest*, was created. The essential question guiding this research was: Do games make a difference in student learning and in a student's motivation to learn?

LIMITATIONS OF THE PROJECT

The game was implemented in a high school sophomore English class as a component of a King Arthur unit. The research was quasi-experimental and used intact groups. Students fell into two separate classes during the morning hours. Both classes received and utilized the exact same syllabus, class expectations, text books, teacher, and curriculum, with the exception of the addition of the game. The first class received the modified curriculum using *Knighthood: A Quest*, while the second class did not receive the game. The class receiving the modified curriculum did so under the guise of using it as a review tool to prepare for the final exam for the unit. The class not receiving the game used traditional test review tools that were available to students earlier in the semester. After the final exam was taken for the unit, the teacher compared the test scores between the two groups to determine which review method was more successful in increasing learning effectiveness.

DEFINITION OF TERMS

In order to be categorized as a game, an activity must include several basic characteristics. The activity is usually "a contest of physical or mental skills and strengths, requiring the participant(s) to follow a specific set of rules in order to attain a goal" (Hogle, 1996, p.4). Games may also involve an element of randomness, chance and/or fantasy. A game always involves competition of some sort, whether it be against another player, a computer, or even one's self. Games can be instructional, for fun, or a combination of the two (Brights & Harbey, 1984; Dempsey, Rasmussen, & Lucassen, 1994; Malone, 1980).

An educational game used within the classroom context is a tool. A tool is a device that "a user may operate and manipulate to make a process easier or more productive" (Hogle, 1996, p.7). A tool can be further described as cognitive when it assists in constructive thinking (Pea, 1985). Cognitive tools aid students in performing tasks or learning skills that may otherwise be beyond their abilities. Students become more independent thinkers when using effective cognitive tools because those tools can assist in encouraging and refining higher order thinking skills (Salomon, 1993). While it is true that not all games are designed to be educational in nature by teaching or fostering skills and encouraging higher level thinking, for the purpose of this project, educational games will be considered cognitive tools.

CHAPTER TWO—REVIEW OF THE LITERATURE

INTRODUCATION

A major trend in education is the continued change of student body populations. To address this reshaping of the education population—as classes continue to fill with students from various economic, social, and ethnic backgrounds, and learner ability—teachers must continue to create and implement innovative pedagogy to reach learners (Azriel, Erthal, & Starr, 2005). In order to successfully reach and educate such a diverse population of students, teachers must adapt to individual learning differences among their learners (Corno & Snow, 1986; Sternberger, 1995). One method to reach these learners is to implement educational games in the classroom as a learning and teaching tool because, despite all of the various age, economic, ethnic, or social background differences, "people understand the language of play" (Azriel et al., 2005, p.1).

Since the "language of play," or games, is everywhere and involves nearly every aspect of our lives, so too is the spirit of competition, excitement, and engagement that surrounds them. The presence of games is easily evidenced by the prevalence of game shows, televised sporting events, and the increased occurrence of reality T.V. Given this increased cultural focus on play and interaction, it is no wonder that teachers are becoming ever more critical of standard classroom pedagogy, and are beginning to adopt more interactive classroom techniques (Becker & Watts, 1995). Over the past two decades, the traditional teaching method of teacher as lecturer and student as

note-taker has been criticized as stimulating for only one type of learner, namely the auditory learner (Sternerger, 1995). As many teachers can probably tell you, reaching or appealing to only one type of learner is unacceptable, especially since there is a large body of evidence that now suggests that utilizing interactive teaching methods works far better at reaching and engaging students than traditional lecture methods (Philpot & Peterson, 1998). Interactive teaching methods can range from the use of guest speakers, student presentations, student-led and centered discussions, and, of course, to educational games.

HISTORY OF GAMES

Games and other forms of experiential learning gained popularity in the 1970s and 1980s because "they present an interesting and engaging alternative to the traditional lecture method" (Azriel et al., 2005, p. 10). According to Ruben (1999), games provide varied approaches to learning and outcomes, encourage collaboration and peer-learning, and promote active learning. Research indicates that cooperative learning models, such as games, contribute to students' success (Harton, Richardson, Barreras, Rockloff, & Latane, 2002).

Under Dewey's (1994) influence, games began to play a larger role in teaching methodology. Dewey recognized that games not only provided entertainment, but also offered opportunities for learning. Games motivate and also help students develop skills, abilities, and strategies. This makes games an important element of teaching in

schools. Most educators understand that it is possible to learn through play. In fact, games form a part of the educational strategies used by teachers at all schooling levels (Gros, 2003).

CHARACTERISTICS OF GAMES

For a game to be considered truely effective, it must have some very specific characteristics. First, the game must be fun because, as many teachers know, if something is entertaining and engaging, participants are more likely to play longer and obtain more from the experience (McKeachie, 2002; Jensen, 1998; Trabasso, 1987; Cashin, 1979).

A game must also provide some sort of intrinsic motivation, "the inner drive of an individual to achieve" (Edenfield, 2002, p.12). This is because students who have a high level of intrinsic motivation tend to be self-starters and require less persuasion to engage in activities. Games can, in addition to intrinsic motivation, also have external or extrinsic motivation. In those situations, it becomes necessary for the teacher to "capitalize on extrinsic motivation, which is derived from outside the individual, rather than the individual's inner drive" (Edenfield, 2002, p.12). Techniques that demonstrate and encourage extrinsic motivation are the use of verbal and non-verbal behavior cues, persuasion, acting as role models, and the use of rewards or punishments. While the obvious ideal is for students to participate in activities for intrinsic purposes, that is not

always possible. However, "extrinsic rewards may be particularly useful when intrinsic motivation is lacking" (McKeachie, 2002).

Games as cognitive tools are important in the classroom setting because they allow students to achieve goals that they are motivated to reach, while at the same time reducing the need for laborious or intensely time consuming activities (Malone & Lepper, 1987). The motivation to reach those goals can be either internal or external. With the use of rewards for gaming interaction, students lacking intrinsic motivation will be interested and motivated in the learning process because it is a less tedious learning environment, and gaming becomes a supplement to traditional instruction (Randel, Morris, Wetzel, & Whitehill, 1992). By using a cognitive tool or game, it is sometimes possible to turn extrinsic motivation into intrinsic motivation because a game has the capacity to challenge learners to use skills they would not ordinarily use (Malone & Lepper, 1987).

Additionally, games must offer just the right amount of challenge. Games must not be too difficult, or they may discourage students from participating because the likelihood of success is low. This is consistent with Piaget's (1951) process of equilibration, which encourages learners, when a solution is attainable, to attempt to resolve the problem. However, they also must not be too easy, as they may again discourage participation because students will find them dull and boring (Lepper & Malone, 1987; Malouf, 1988).

STUDENT MOTIVATION

Ultimately, for students to succeed in school, they must be motivated to learn. For some students the simple joy of learning is enough to engage them; for others, they require outside motivation, such as grades or rewards and punishments. However, these types of motivation are not always successful in engaging all or even the majority of students. Therefore, it sometimes becomes necessary for a teacher to utilize other methods of engagement. One method that may increase student motivation is an increase in teacher instructional innovation (McDaniel, 1985).

In his Hierarchy of Needs, Maslow (1970) discussed the various types of motivation that drives humans. According to Maslow, humans have both low and high level needs that must be satisfied for a person to thrive. Low-level needs, such as safety, must be met before high-level needs, such as self-actualization. This applies to educational games because students require a safe and comfortable classroom environment before they can become motivated to learn, and educational games can help create that positive atmosphere. For example, if a student is uncomfortable and shy in a classroom, she may not feel safe enough to engage in the learning process because she is in constant fear or under stress. By applying Maslow's Hierarchy of Needs, a teacher could easily create a safe, positive, and comfortable environment by utilizing educational games, which would allow the student to meet that low-level need of safety. Once the student has attained her low level need, she may then increase her willingness and motivation to engage in learning. The innovative method of game use

may assist in creating a safe, positive, and comfortable classroom because games "remove the stress of being placed on the spot for having to arrive at the correct answer individually" and in public (Azriel et al., 2005, p.10).

As discussed earlier, students can be either extrinsically or intrinsically motivated in the learning process, and that type of motivation can greatly influence how they approach learning (Lumsden, 1995). The challenge to teachers is not so much reaching intrinsically motivated students, who are simply motivated to learn out of the sheer pleasure of learning, but rather extrinsically motivated students, who require outside stimulation, rewards, punishments, etc. to engage in learning. Students who are extrinsically motivated require more creative and innovative teaching methods from their teachers. These methods grab their attention and create a stimulating and engaging learning environment (McKeachie, 2002).

Student motivation for engaging in educational games is essential, as it serves as the vehicle by which students can recall and retain the educational and instructional material implanted within the game. Evidence supports the conclusion that certain gaming formats may actually increase and improve learner retention of instructional material (Dempsey, Lucassen, & Gilley, 1993; Pierfy, 1977). For example, in 1977, Pierfy reviewed and compared twenty two gaming studies and found that the learners engaged in game playing demonstrated "greater retention over time than conventional classroom instruction" (Hogel, 1996, p.10). Part of this increased retention is due to the

fact that games are more effective than traditional instruction at holding student interest (Dempsey et al., 1993; Jacobs & Dempsey, 1993; Pierfy, 1977).

GAMES IN THE CLASSROOM

As many teachers can explain, it is very important to find new teaching techniques or simply reinvent already existing ones to motivate students to learn. In order to fully engage students in the learning process, it is necessary to go beyond conventional teaching methods by incorporating games in the classroom curriculum. There exists a critical connection between "motivating students [and the] exploit[ation of] the creativity and inventiveness of gaming" (Philpot & Peterson, 1998, p.119). Essentially, games function as a good supplement to the standard curriculum, especially lectures, because they supply students with additional learning experiences and modalities that would not be available in a typical classroom experience (Sugar, 1994). Games, by their very nature, help to establish a creative environment within the classroom that encourages students to work collaboratively, to effectively communicate, and to problem solve (Barclay & York, 1996; Warburton & Madge, 1994; Whiteley & Faria, 1989). Once students do become engaged in the learning process, through the utilization of gaming, they improve their purposefulness and motivation (Gray, Topping, & Carcary, 1998).

It is not necessary for teachers to develop their own individual games for students, although it can be rewarding in its own right. Many existing games can easily

be tailored to fit the specific needs of a course or unit. For example, many teachers already adapt the popular T.V. show *Jeopardy* for classroom use. *Jeopardy*, with its five categories, can easily be customized to cover specific chapters from a text book, the major organs in the human body, or significant battles during the Civil War. Students can be divided into two or more teams to compete for points by working together to provide the correct response. The type of collaborative, social, and peer based learning that *Jeopardy* inspires in the classroom mirrors the learning that takes place outside of the academic realm, thereby further encouraging students to engage in the learning process and classroom activities (Ruben, 1999).

By increasing student interest in classroom activities and subject matter, educational games can be linked to an improvement in academic performance. For example, Gray et al. (1998) found that the use of games improved student test scores on a driving test. Likewise, Doyle (2001), discovered that using games as a review tool can energize learning. This is because "games encourage participation and active learning" (Azriel et al., 2005, p.11). Utilizing games as a review tool for a course or unit may capture the attention of otherwise inattentive or uninvolved students and motivate them to participate actively in the learning process.

SUMMARY

Given the ever changing nature and diversity of students within classrooms today, it is essential that teachers implement new and innovative teaching methods to

better engage students in the learning process (Azriel et al., 2005). One method is to utilize educational games. This is because games are a part of every person's life and part of every culture in one way or another (Hogle, 1996). Whether it be from our youngest days as toddlers playing with blocks or as adults watching *Jeopardy*, we play games to help us better interact with others, understand the world around us, or simply to have fun.

Games in the classroom have been gaining popularity since the 1970s and that popularity continues to grow as the benefits of educational games are realized (Pierfy, 1977). Games help motivate students to engage in the learning process because they provide new and interesting learning modalities, promote collaboration and peer-learning, and foster active learning (Ruben, 1999).

For games to function as successful and interesting learning tools, they must first and foremost be fun. If a student is not interested in a game, she will either not play it or not play it for very long. Games must also provide motivation for the learner to play the game because the benefit from the game can only occur if the student plays it and plays it long enough to either acquire and/or master the skill and/or subject matter that is presented. Additionally, games cannot be too difficult or too easy for students. If a game is perceived as too difficult, students will simply not attempt to play it. If a game is too easy, students are not challenged to learn, and they will quickly become bored with the game and cease to be actively involved (McKeachie, 2002; Jensen, 1998; Trabasso, 1987; Cashin, 1979).

Games can also be used as a tool to motivate students to learn. For example, some students shy away from classroom activities because of a fear of failure and lack of social acceptance (Maslow, 1970). By playing games, students are encouraged to work collaboratively in small groups. This mitigates the fear and pressure of failure, which allows students to further engage in other classroom activities (Azriel et al., 2005). This collaborative work also provides students with the social outlet they crave, while at the same time fostering the learning of skills and subject matter (Dempsey et al., 1993; Pierfy, 1977). Ultimately, if a student is engaged in learning activities in the classroom, she is more likely to learn and benefit for those activities.

CHAPTER THREE—PROCEDURES

NEED FOR THE PROJECT

The modern education world is being reshaped by an important trend, namely that "student bodies are becoming increasingly diverse" (Azriel et al., 2005, p.9). Schools are continually being filled with students from various economic, cultural, social, and ethnic backgrounds, while additionally serving more students with special needs or learning disabilities than ever before (Azriel et al., 2005). For example, Edgar and Hayden (1985) noted that the number of individuals classified as learning disabled increased by 119 percent from 1976 to 1982. That number continued to rise another 41 percent from 1982 to 1998, according to the U.S. Department of Education (1998) . The Foundation of Children with Learning Disabilities (1987) states that learning disabled children represent more than ten million students within the total population of the United States.

In addition to facing an increasingly diverse student population, teachers face students who are unmotivated and disinterested in school. Students who are not traditionally motivated to succeed for external rewards such as grades or a diploma can attain internal motivation from games. This is because game playing in a classroom setting teaches students how to "learn to be motivated" (Coleman, 1968, p.3). Essentially, a game provides students with a set goal that is correlated directly to content information. This goal can only be attained when students follow the structure

of the game, and it is that structure which not only promotes retention, but also usability of the information. Thus, the structure of the game reinforces the content of what is learned because it is presented in an engaging manner. Additionally, the process by which the student reaches the goal is also highly prized for the problem solving and critical thinking skills that are fostered (Coleman, 1968).

In order for educators to successfully educate such a diverse student population based on both cognitive needs and motivation, they must adapt their teaching methods to individual learner differences and needs (Corno & Snow, 1986; Sternberger, 1995). One teaching tool that can bridge the gap amongst learning abilities, age, economic, ethnic, and social backgrounds by reaching and motivating all learners is that of interactive teaching methods, such as educational games (Philpot & Peterson, 1998; Sternberger, 1995).

PROCEDURES FOR THE PROJECT

For the research I used a quasi-experimental design with intact groups, and students in two high school sophomore English classes. Both classes were taught by the same teacher, and students received the same syllabus, class expectations, text book, lecture materials, curriculum and were taught in the morning. Students were placed in the classes based upon their schedules and did not have prior knowledge of the game research. The students in the two morning sections of the class matched those taught

later in the day in that they had similar demographic characteristics of students in other sophomore English classes.

In order to determine whether the use of a game as a review tool was superior to a traditional lecture-style review session, I had one class use *Knighthood: A Quest* to review the material for the King Arthur unit as preparation for their unit exam. I used this game because it was specifically designed to test the material the students needed to know for the exam in a simple question and answer format. One class was randomly chosen to play *Knighthood: A Quest* as a method for reviewing the exam material. The class designated to play the game formed the treatment group. The other class, which instead received the traditional lecture review, served as the control group.

IMPLEMENTATION

Knighthood: A Quest is intended to be played after students have finished reading and studying Roger Lancelyn Green's *King Arthur and His Knights of the Round Table* and examining expectations and customs of medieval knights, squires, etc. The game is designed to function as an informational review to prepare students for their unit test. After playing the game, students should be able to correctly answer questions on the unit test about key events, plot, and character development from the novel.

The treatment class played the game in small groups of six. This required five separate game boards for *Knighthood: A Quest*. Most small groups played two rounds

of the game. Each group received a game board, six game pieces, one four-sided die, one deck of Questing Questions Cards, and one deck of Chivalry Cards.

After students spent one class period playing the game, they were given a final unit exam during the next class period. The exam consisted of matching, multiple-choice, and short-answer questions, and one essay response. For the purpose of this study, I did not include the essay response in the final comparison of exam scores between the treatment and control groups.

Table 1, below, reports the grade breakdown of both the treatment and control groups by percentage. The treatment group was found to have a better passing percentage of 91 percent, as compared to the control group's 79 percent—a difference of 12 percent. Additionally, more students in the treatment group—37 percent, received a grade of A, whereas the control group only had 29 percent of students earning the same grade. In the control group 25 percent of the students earned a B, while 28 percent of the treatment group did. In the C grade category, the control group actually performed better than that of the treatment group. In the treatment group, only 22 percent of the students earned a C grade, but in the control group 25 percent earned a C. No students earned a grade of D in the control group, and four percent earned a D in the treatment group.

Test Results—Table 1

Grades	Treatment Group—Percentage of Students	Control Group—Percentage of Students
A	37	29
B	28	25
C	22	25
D	4	0
F	9	21

The most dramatic results of the study are the increased performance of students in the treatment group in the A and F categories. The treatment group had a higher overall higher passing rate by 12 percent and an eight percent improvement in the A grade category. The middle grades of B, C, and D were within four percent of each other, and fall within the standard deviation.

It appears that the use of an educational game was effective in this context in assisting more students in passing the class and more students attaining the highest grade possible.

CHAPTER FOUR – THE PROJECT

The game is designed for Washington High School students in the 10th grade, who have read King Arthur Legends and studied medieval life and expectations. The students are typically between the ages of fifteen and sixteen. The students are usually moderately interested in the subject matter. The game should be played in a classroom setting and utilized as a review tool. The game may be played more than once, as doing so may reinforce the information.

The premise of the game is that the student playing is a young peasant, in King Arthur's Camelot, who dreams of one day becoming a knight. As the student embarks on her quest to attain knighthood, she will need to use her previous knowledge of Arthurian knights to help guide her on her journey. In order to attain knighthood, a questing student must earn a set number of Chivalry Cards.

The goal is to be the player who collects the most Chivalry Cards by the end of the game and qualifies for knighthood. Chivalry Cards can be earned in two ways. The first way to earn the Cards is by correctly answering questions of varying difficulty. The Questing Question Cards are worth one, two, or three Chivalry "points" or Cards based upon the difficulty of the question. Thus, the more challenging the question, the more "points" or Cards it is worth. The second way to earn Chivalry Cards is to reach the "finish line" of the game. Depending on the order, players finishing first, second, or

third can receive extra Chivalry Cards. The players who finish fourth, fifth, or sixth do not receive additional Chivalry Cards.

To set up the game, the board should be positioned so that every player can easily reach it to manipulate the game pieces. The Questing Questions and the Chivalry Cards are placed on the board, face-down, in their designated locations. Each player then selects her game piece and positions it at the beginning of the game path. In order to ensure fairness, the youngest player begins the game. Game play proceeds to the left.

To begin a player's turn, the player rolls the die and moves her game piece the number of spaces indicated on the die. Then, the person to the right of the player draws a Questing Question card from the top of the deck and reads the question to the player. If the player answers correctly, she collects the number of Chivalry Cards indicated on the Questing Question card. If the player answers incorrectly, she does not get any points for that question. Additionally, that question is then open to other players, except for the reader, to answer. The first player who answers the question correctly earns the Chivalry Cards. Thus, it is possible for players to "steal" questions. In the case of a tie, the question reader determines the winner. When the turn is complete, play continues on to the left of the original player.

On the board, there are a few specially labeled spaces. If a player lands on one of those spaces, she must follow the directions indicated on the space. Additionally, if a

player is eliminated from the game, through the use of special cards, she then becomes the question reader for the duration of the game. When a player is eliminated, all of her Chivalry Cards are returned to the deck. If the players run out of Chivalry Cards before they finish the game, they may use pen and paper to keep track of "points" earned.

CHAPTER FIVE

SUMMARY

Given the changing nature of the student population, it has become necessary for teachers to develop and adapt new forms of instruction to better help students engage in the learning process. One successful method for increasing student learning and engagement is using educational games (Corno & Snow, 1986; Sternberger, 1995).

Educational games provide students with cognitive tools to develop abilities and interests in classroom activities. Educational games offer students safe and interesting methods for engaging in classroom activities (Philpot & Peterson, 1998).

In order to test the effectiveness of games use in the classroom, *Knighthood: A Quest*, an original game, was created and used in one Sophomore English class as a review tool for a final unit exam. Another Sophomore English class did not receive the modified curriculum and instead received a traditional lecture-style review session. The same terms and concepts were covered in both review sessions. Additionally, students in both groups were given the opportunity to ask questions of their teacher.

Both groups are similar in demographic and academic ability, met in the morning, and received the same textbooks, syllabus, and teacher. The class that did not receive the game as a review tool, the control group, had 28 students. The class that received the modified curriculum, the treatment group, had 32 students. The final exam grade of the treatment group was compared to the control group.

CONCLUSIONS

After the review sessions, when the classes next met, both groups took the same exam over the King Arthur Unit. The exam consisted of multiple-choice, matching, short-answer, and one essay question. To ensure the accuracy of results, the essay question was not used for this study.

Table 2 reports the mean scores and the standard deviation for both the treatment and control groups on the final unit exam for King Arthur. The total points possible, discounting the essay question, were 15. Of the possible 15 points, the average test scores for the two groups were 12.41 points for the class that played *Knighthood: A Quest* and 11.69 for the class that received the traditional lecture-style review. The mean scores were less than one point apart (0.72).

Exam Scores—Table 2

Group	Mean	Standard Deviation
Treatment	12.41	3.52
Control	11.69	3.41

While the difference between mean scores of both groups were not statistically significant, the difference in the number of students passing the exam between both groups was remarkable. As stated earlier, only 9 percent of the treatment group failed the exam, whereas 21 percent of the control group failed. This is a 12 percent improvement and a difference of over three standard deviations. Additionally, a greater percentage of the treatment group, 37 percent, was able to earn the highest possible

grade of an A, whereas in the control group 29 percent earned an A. Again this is a marked improvement of 8 percent and a difference of over two standard deviations. Given these results, it appears that students who received the modified curriculum performed better on the exam than those in the control group.

This study found that the use of *Knighthood: A Quest* was more effective than lecturing in preparing students for the final unit exam. This is because games "cut across racial, ethnic, cultural, gender, and age differences" and appeal to a large number of students not served by traditional lecture-style classrooms (Azriel et al., 2005, p.12). Games, like play, are an ever-present component of our society and as such serve as an effective tool for instruction for a wide range of learners.

RECOMMENDATIONS

Given that the game in this study emerged as the superior method for improving student performance on the unit exam, it can be concluded that using well created and structured games in the classroom is an effective method for reviewing subject matter. Therefore, I recommend that educators, whenever possible, break from the traditional lecture format and develop creative teaching techniques that engage the learning styles of various students, thus motivating them to take an active role in their learning. Additionally, I would advise teachers not to limit their use of games in the classroom to just exam reviews, but also to use them to teach basic skills or subject matter

throughout the school year. In fact, if a teacher begins utilizing games early in the school year, the effects on the students may be even more pronounced.

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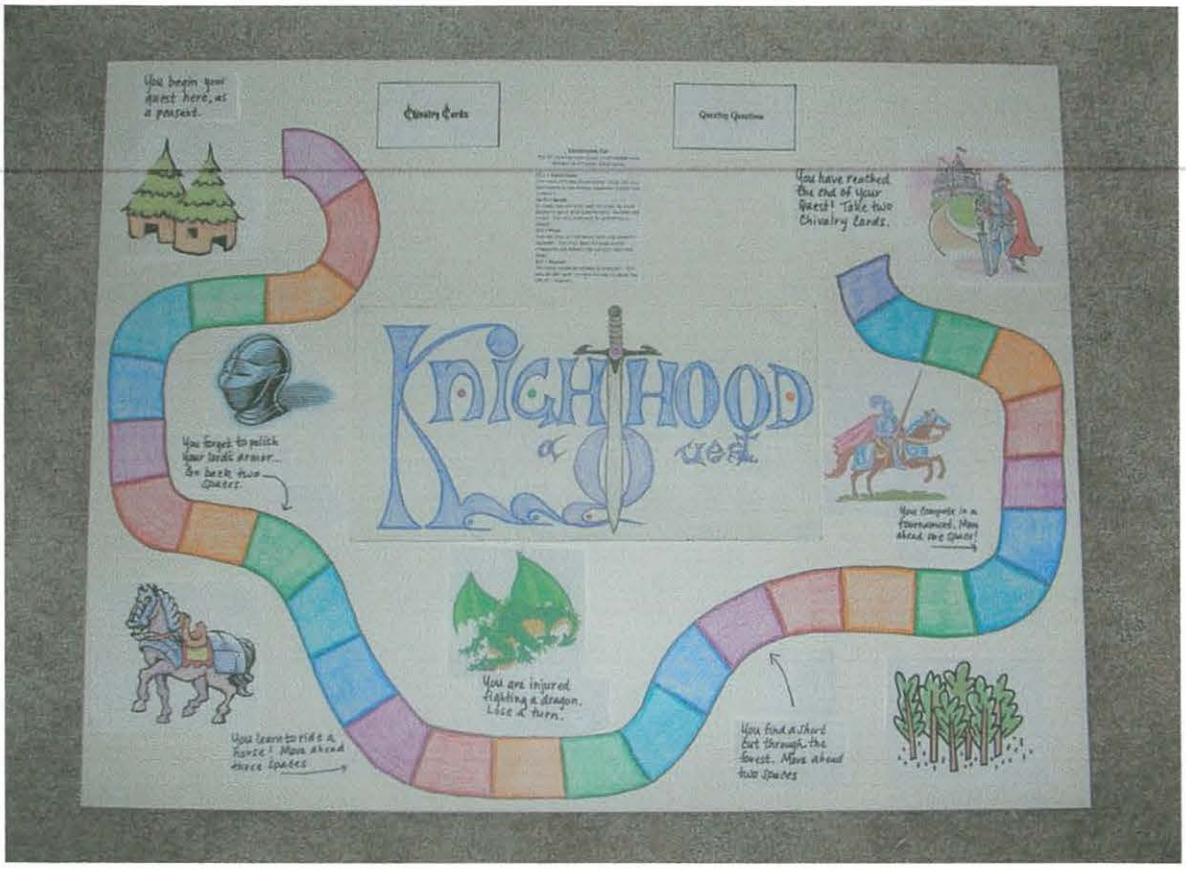
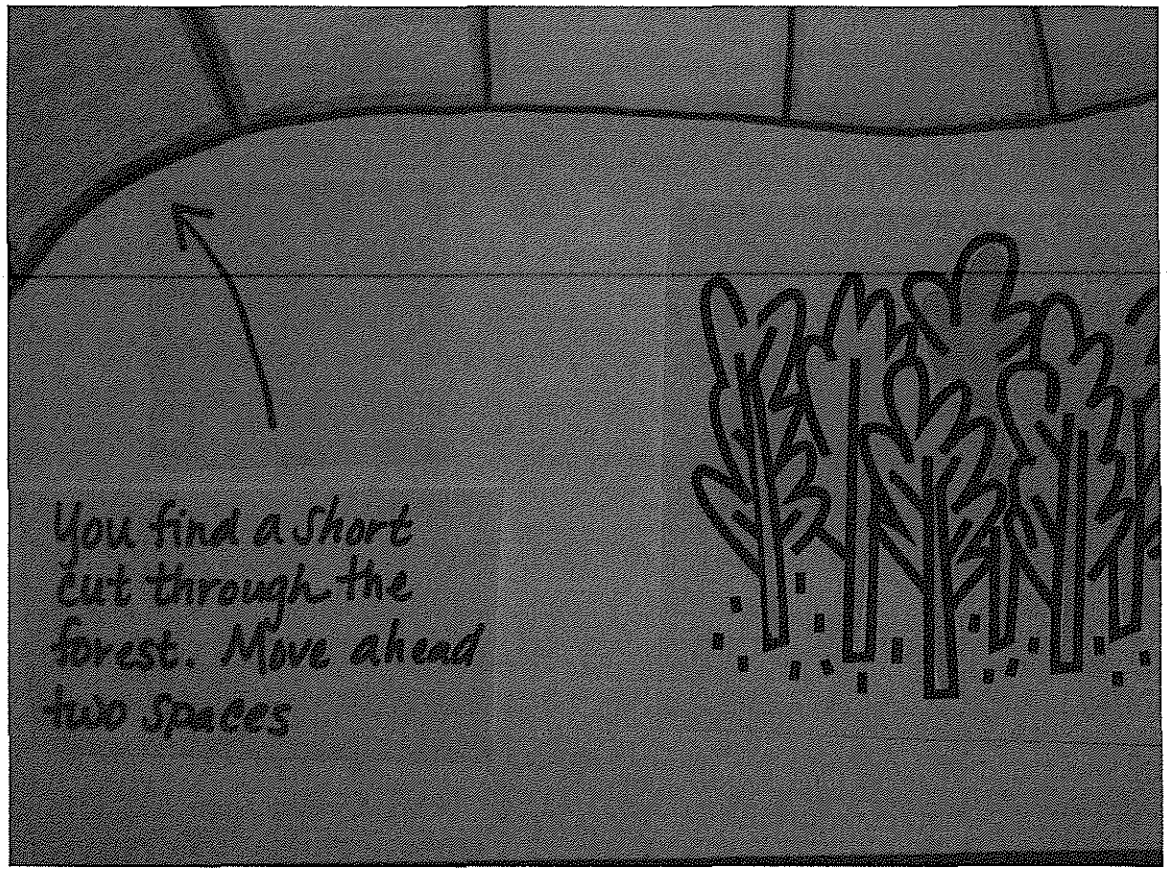
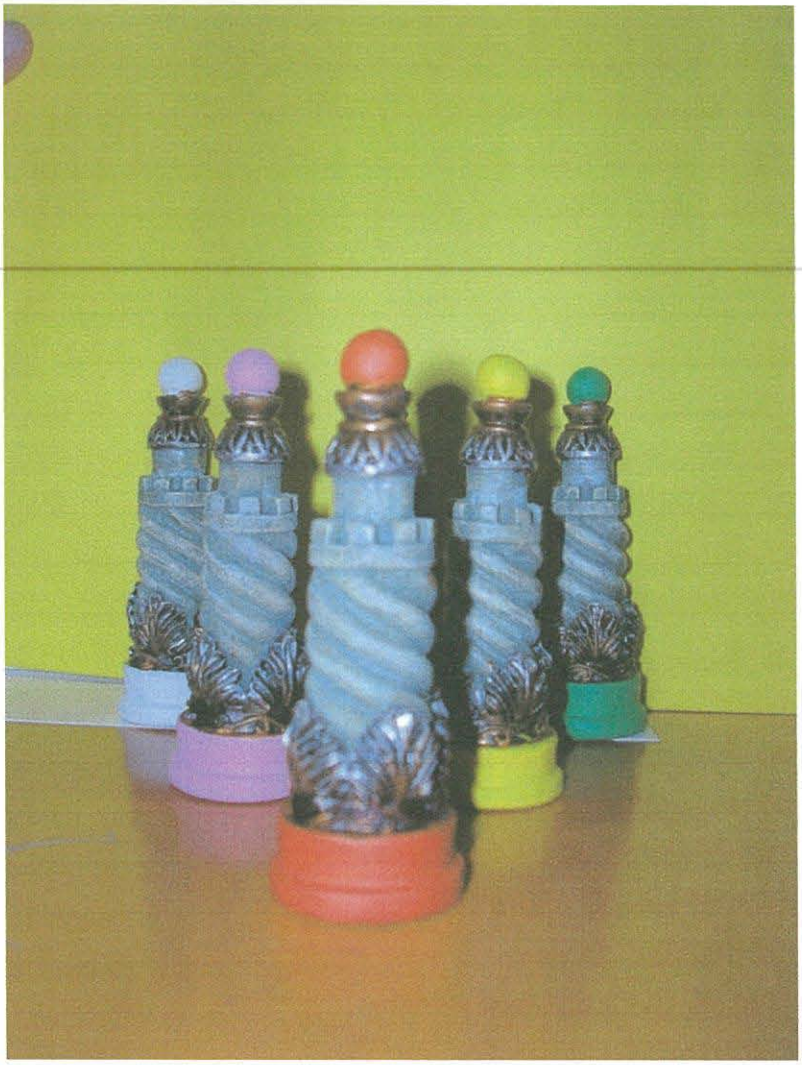
APPENDIX



Knighthood: A Quest – the board game



Knighthood: A Quest – Example of a "special" space



Knighthood: A Quest – game pieces