



*Article*

**It's All Fun and Games until Someone Learns Something: Assessing the Learning Outcomes of Two Educational Games**

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**Abstract**

**Objective** – To determine whether educational games can be designed that are both fun and effective in improving information seeking skills.

**Methods** – Two skills that are known to be particularly difficult for students taking a required information literacy test were identified. These skills are the ability to identify citations and the ability to search databases with keywords. Educational games were designed to address these two skills. The first game, *Citation Tic Tac Toe*, placed commonly used bibliographic citations into a tick tac toe style grid. Students were required to play the Tic Tac Toe game and subsequently given citation identification exercises. The second game arranged key concepts related to search phrases in a Magnetic Keyword interface. Students were observed searching databases before and after playing the Magnetic Keyword game and their pre- and post-play searches were analyzed.

**Results** – Students who played the *Tic Tac Toe* game improved more from pretest to posttest than students who only took an online tutorial. In addition, students who played the Magnetic Keyword game demonstrated quicker database searching for their topics and expressed increased satisfaction with their results.

**Conclusions** – Games can be created which have measurable educational outcomes and are fun. It is important, however, to establish the educational objective prior to beginning game design.

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## Introduction

Scholars in many disciplines are beginning to see the value of games and investigate their design and use as educational tools. In 2005, the American Library Association hosted *Gaming in Libraries*, a symposium on the relationship between games and library services. Since then, countless other venues have sprung up for the discussion of the value of gaming for educational purposes. Those interested include all types of educators, game designers, computer programmers, marketers, and even librarians. Educators are using games to teach everything from financial literacy (WPI Media Relations) to social responsibility (<<http://www.gamesforchange.org/>> to surgical procedures (Sourin 6-9). Games hold vast appeal to educators and players in all age groups.

Fortunately for those interested in exploring the use of games, profiles of people who play online games, and the kinds of games that appeal to different people are plentiful. The Pew Internet & American Life Project reported that fifty-three percent of American adults over eighteen years old play games, with twenty one percent of adults playing every day (Lenhart and Jones 1-9). An earlier Pew report, *Let the Games Begin: Gaming Technology and College Students*, found that in 2003 seventy percent of college students reported playing online games, and one hundred percent of students surveyed had played a video game at some point in their lives (Jones 1-14). Evidence suggests that players are likely to be educated and dedicated to game-play.

Given the plethora of data available about adult gamers, it seems unwise not to investigate ways of exploiting the medium for use in higher education. The challenge of designing an educational game, that retains

the essential intrinsic motivation of fun, lies in beginning with the learning objective in mind and ensuring that the fun objective is included.

This project originated when two university administrators at James Madison University (JMU), Virginia, USA asked the same person to address two different challenges. In 2004 the Dean of Libraries and Educational Technologies at JMU began to notice many students engaged in what appeared to be gaming activity on the public computers in the library. Concurrently, an Associate Dean in the college that includes the health science, nursing, and social work programs identified a need to help pre-professional students understand the complex issues related to health literacy. After considerable thought and discussion the decision was made by the Dean of the Library to apply for an Institute for Museum and Library Services (IMLS) national leadership grant to determine whether a game-like environment could meet the unique challenges of teaching health literacy and information literacy.

This paper describes the design and testing of two games specifically created to impart information literacy skills in measurable ways. The first game, *Citation Tic Tac Toe*, was designed to help undergraduate students correctly identify a variety of bibliographic citations. The second game, *Magnetic Keyword*, was designed to assist the same student population translate phrases into keywords in order to search bibliographic databases more effectively.

## Literature Review

In recent years, the literature on games in education has grown substantially. Literature about the relationship between games and library services is extensive, ranging from

discussions on the characteristics of gamers (Martin and Ewing 209-225), the process of designing games (Markey et al. 663-681), what distinguishes a game from other active learning techniques (both electronic and otherwise), the unique challenges of collecting games in libraries, to student satisfaction with games (Smith 1-12), or how games can be integrated into library programming at all levels. When the game creation work described in this paper began, there was a notable absence in the literature of models for assessing games and evidence demonstrating the effectiveness of games relative to traditional methods in teaching specific library related skills. Since that time, there has been continued research into the efficacy of games as educational tools.

The previously mentioned lack of evidence does not mean that games don't teach. Indeed, programs similar to that described by Smith, in which the primary goal was to counteract the boredom that students felt while in mandatory classes, often get high student satisfaction marks. Surely students are more likely to learn if they are engaged and have fun in class? But in today's educational atmosphere the need for evidence and accountability is stronger than for fun and engagement.

A recent addition to the nascent concept of demonstrating that games are effective is the study conducted by Hickey, Ingram-Goble, and Jameson on the use of a commercial immersive online game to teach socio-scientific inquiry in ecological sciences. They describe studies wherein sixth-grade students used the game *Quest Atlantis* to learn specific federally mandated scientific concepts. Moreover, they describe the assessment of the use of *Quest Atlantis* and offer principles for the design of assessments in virtual environments. The experience described is valuable and significant since, as they state, "Failure to produce convincing evidence of increased achievements (and models for obtaining such evidence) is likely to constrain research funding and broad adoption of educational games and simulation, and redirect educational technology resources

toward narrow test-preparation and tutoring applications." (Hickey, Ingram-Goble, and Jameson 187-208).

Constance Steinkuehler and Sean Duncan conducted a more ambitious study to determine whether the wildly popular multiplayer game, *World of Warcraft*, could be shown to spontaneously engender "scientific habits of mind". They analyzed the transcripts of nearly two thousand online discussions carried out by players of *World of Warcraft* to determine whether they contained evidence of eighteen different markers of scientific thought. They found that the discourse that playing the game elicited consisted of "social knowledge construction" eighty-six percent of the time (530-543). They further concluded that the "predominant epistemological disposition exhibited in the forum posts was 'evaluative' and therefore appropriate to science" (530-543).

These examples represent a small selection of the ways that games are being integrated into education and studied for impact. It must be noted that online games themselves are so varied that no single model of assessing their impact will work for all activities described as games. Online games represent novel ways of interacting, of being in real and virtual worlds, and of learning. Quantitative methods of generating scientific evidence can work in some cases; qualitative methods are more appropriate for others. This point was eloquently argued by Steinkuehler, Black & Clinton, who stated that "the phenomena of study are ever widening while the range of methods considered legitimate for their investigation is increasingly narrowed." (95-100). In keeping with this sentiment, this paper describes the study of two games by two different means. The conclusions of each experiment, while generally in agreement with each other, illuminate the unique challenges of using games to address specific learning objectives. Most interesting, perhaps, are the questions that the study raises regarding how to teach the constellation of skills that contribute to research and information literacy.

## Context and Aims

James Madison University (JMU) is a comprehensive university with approximately eighteen thousand students located in the central Shenandoah Valley of Virginia, USA. The University's mission is to prepare students to be educated and enlightened citizens who lead productive and meaningful lives. As an Association of College and Research Libraries (ACRL) Best Practice institution for its information literacy program, all undergraduate students must complete an online information literacy tutorial and pass an information seeking skills test (ISST) before they can register as second-year students. This requirement means that valuable data is gathered each year about students' skills related to the ACRL Information Literacy Competency Standards (Association of College and Research Libraries). Students who do not pass the ISST may choose to repeat sections of the tutorial or meet with a librarian for extra assistance with information seeking. Because of this requirement, librarians have access to extensive data as well as anecdotal information about which specific skills hinder students' ability to pass the test. Librarians at JMU have learned that two skills that students struggle with are the ability to identify bibliographic citations and the elements that comprise them (ACRL Information Literacy Competency Standard 1.2), and the ability to break a topic into keywords (ACRL Information Literacy Competency Standard 2.2.b) (Association of College and Research Libraries).

In 2005, a grant was received from the Institute for Museum and Library Services to create games that teach health literacy and information literacy. The grant application stated, "The goals of this project are threefold; to produce a series of games that help develop health literacy and information literacy skills, to evaluate whether traditional information literacy skills can be acquired through game-like experiences, and to determine if this approach is more appealing and successful with our students than our current text-based

approaches." Staff from the JMU Libraries and Educational Technologies division worked to create several games. The first game was a complex role-playing game designed to teach pre-professional health students about the challenges of compromised health literacy. The subsequent games, which are the subject of this paper, were designed to address students' ability to correctly identify bibliographic citations and to identify keywords related to search phrases.

Because there is currently no "gold standard" for assessing the impact of educational games on explicit learning objectives, the authors chose to evaluate the two games in different ways. The first study was a quantitative study in which players took an achievement test (the pretest), played the game (*Citation Tic Tac Toe*), and repeated the achievement test (the posttest) to determine whether progress was made in their ability to identify citations. Players were compared to a control group who did not play the game. This study design was chosen since there are absolute correct and incorrect answers to citation identification. The goal of this study was to determine whether students who played the *Citation Tic Tac Toe* game were better at identifying bibliographic citations by type than students who took the online tutorial.

The team designed the second game, *Magnetic Keyword*, to address a competency that does not lend itself to definitive correct answers. The ACRL Information Literacy Competency Standards address the ability to construct a search query in standard two, specifically stating in 2.2, "The information literate student constructs and implements effectively designed search strategies." Outcome 2.2b states that this competency is shown by "[Identifying] keywords, synonyms and related terms for the information needed." From a practical perspective, this skill is often addressed in library instruction sessions by having students break their search phrase into its component keywords and brainstorming lists of broader and narrower terms and synonyms. Measuring a student's ability to do this, and to refine their search based on

results, is a subjective matter that is influenced by the search topic, the student's familiarity with the database content and interface, and other variables. Because this competency is more of an art than a science, a qualitative method was chosen to evaluate the effectiveness of the *Magnetic Keyword* game. Students were videotaped while playing the game, and recordings were later analyzed to determine whether search speed and satisfaction improved after playing.

the city and name of the publisher." This feature was designed to help the player learn the rules of citation identification as they play the game. Once the player correctly identifies three citations in a row, they win the game. If they fail to make the correct choices in three adjacent boxes, the game wins. Upon completion of each game, the player can choose to play again. Figure 1 contains a screen shot of the feedback screen for the *Tic Tac Toe* game.

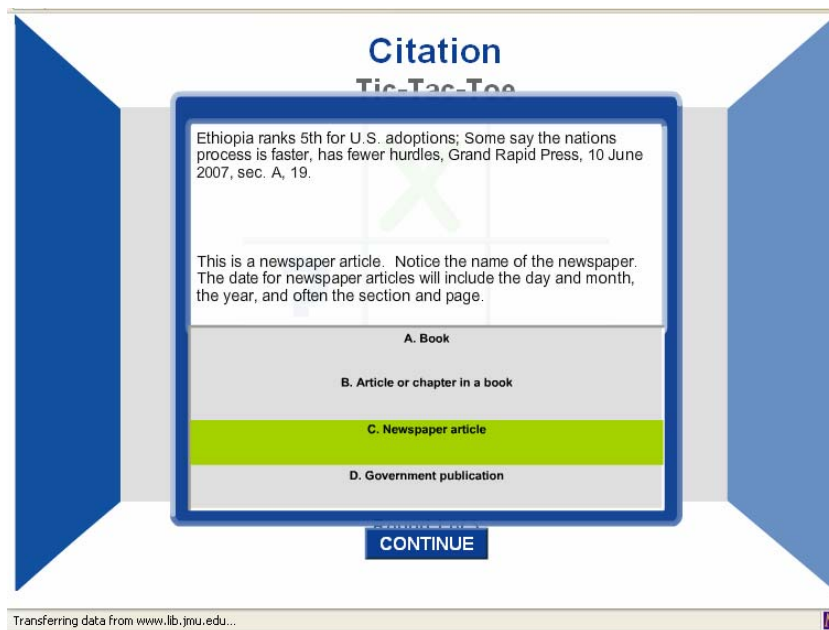


Fig.1 Screen Shot for Tic Tac Toe Game

*Citation Tic Tac Toe* was developed and studied first. It is a standard tic tac toe game with bibliographic citations in each box. Players select a square on the grid and see a bibliographic citation with four choices as to the type of citation. Choices include book, journal article, a variety of websites, government document, book chapter, dissertation, and newspaper articles. If the player selects the correct type, an X is awarded for that box. If the player chooses incorrectly, the game gives the box an O. When an incorrect choice is made, the game provides feedback in the form of a clue as to how to identify that kind of citation. For example, if the player sees a citation for a book but makes the incorrect choice that it is a journal article, the game generates feedback that says "This is a book. You can tell this quickly by locating

The second game was designed to look like a refrigerator with magnetic words affixed to it, similar to the popular *Magnetic Poetry*® toy sold in bookstores and toy shops. One section of the screen has a simple search phrase displayed, and the other section contains a collection of random words interspersed with words that correspond to the search phrase.

For example, the search phrase "Do students who participate in sports get higher grades?" has the words "students", "sports" and "grades" mixed in with other random words like "heart rate" "traffic" and "practice." In most cases there are three correct words mixed in among 20 distracters. The player drags the identified keywords below the line on the refrigerator and clicks on submit when it is believed the correct keywords have been

selected. The game then generates feedback based on whether all of the correct words, some of the correct words, or none of the correct words have been chosen. Two points are received for all correct words, one for some words, and zero points for no correct words chosen. To integrate this game with a course assignment, the player can be assigned to play until a certain score is achieved or correctly chosen keywords are associated with a certain number of search phrases. Figure 2 contains a screen shot for the *Magnetic Keyword* game.

Both games were designed using Flash with a Microsoft Access database running in the background to manage the game data and player data.

participated in the study during the spring, 2008 semester. These students were chosen based on their enrollment in the course, in which the online information literacy tutorial is required, and their instructors' willingness to participate in the study. It was decided that a true experimental design, in which each student would be randomly assigned to either the experimental group (played the game) or the control group (did not play the game) would not be appropriate for this study. This was because it would be instructionally awkward for some of the students in a section to have access to the game, while others did not. Instead, class *sections* were randomly assigned, which resulted in three sections receiving the game, and four sections not receiving the game.

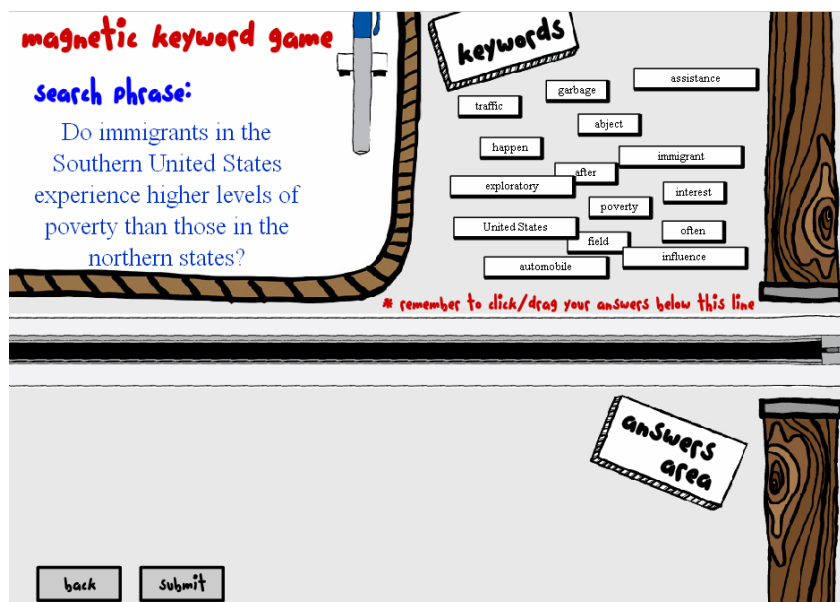


Fig. 2. Screenshot for Magnetic Keyword Game

## Methods

The impact of the *Tic Tac Toe* game was evaluated by comparing the relative achievement levels of students who had played the games with a group that had not played. The central research question concerned the degree to which students' proficiency in identifying citations improved as the result of playing the game.

Seven sections of Gcom 103 (a mandatory communications class for first-year students)

A thirty-five item multiple-choice test was developed to assess student proficiency in identifying citations. A copy of this test is included as Appendix 1. Each item used four response options. All students in the study were asked by their instructors to take the citation test twice—both at the beginning and the end of the semester. Thus, although the same test was used for both the pretest and posttest, the testing periods were separated by nearly three months. For comparison purposes, students were asked to include their student ID number.

The *Magnetic Keyword* game was tested using Morae™ usability testing software along with Bailey's Usability Testing Environment (UTE). Morae™ usability testing software is a program that creates video and audio recordings of users interacting with computer applications, including the face of the user and the software performance. The videos can then be viewed and tagged for later analysis. Bailey's UTE is a piece of software that can run on top of Morae™. It can be pre-programmed with specific tasks for the user to complete, as well as allotting time for the tasks and providing a venue for immediate user input. Bailey's UTE obviates the need for a human-mediated usability test, eliminating the possibility of interference from the mediator. Both programs were chosen based on their current use in the library for website usability testing and because of the researchers' familiarity and satisfaction with them. Student testers were recruited for this study via a notice on the library's website and compensated with a gift card to the university bookstore. Participants were assigned the task of searching for journal articles on a given topic in the database Academic Search Premier. After each search, the user was asked via Bailey's UTE if they were satisfied with their results. After completing four unique searches, students were asked to play the *Magnetic Keyword* game for five minutes. They were then asked to search for articles on four new topics in the same database, and again asked whether they were satisfied. By analyzing the time that lapsed between the first round of searching and the second round (post game play), the researcher could determine whether their search speed improved after playing the *Magnetic Keyword* game.

Table 1  
Descriptive Statistics for the Citations Test

Test	N	Minimum	Maximum	Mean	Standard Deviation	Reliability
Pretest	149	8	31	21.31	4.97	.78
Posttest	134	13	32	22.72	4.64	.77

## Results

### *Evaluating the Impact of the Tic Tac Toe Game on Student Achievement*

The data was analyzed to evaluate students' pretest and posttest scores in order to determine whether the game had a positive impact on student achievement. However, the data analysis was complicated by two factors. First, some students took only the pretest or the posttest, but not both. Second, a number of students did not provide their student ID numbers when they took a test, which precluded merging the pretest and posttest data. Our solution for addressing this problem is described below.

Table 1 shows the basic descriptive statistics for the overall pretest and posttest data. At both time points, the reliability estimates (using coefficient alpha) indicated satisfactory reliability. In addition, as would be expected, test performance was found to generally improve from pretest to posttest, as students learned more about citation identification.

To accurately compare the experimental and control groups, only the data from students who took both the pretest and posttest (and provided IDs on each occasion) were analyzed further. The results for these students, shown in Table 2, showed several interesting findings. First, the 27 students who played the game showed a strong, statistically significant pretest-posttest gain. The effect size index ( $d$ ) indicated that the mean gain was nearly two-thirds of a standard deviation. However, the 47 students who did not play the game also showed significant improvement in citation

identification, albeit to a lesser extent. For these students, test performance improved significantly, with an effect size of just under one third of a standard deviation. Hence, the overall findings were that (a) both groups improved in citation identification, (b) the group playing the game improved, on average, by a larger amount, and (c) the group playing the game performed much higher at posttest.

#### *Evaluating the Impact of the Magnetic Keyword Game on Student Search Speed and Satisfaction*

Evaluation of the impact of the *Magnetic Keyword* game was based on whether students' speed and self-reported satisfaction improved after playing the game. The test was administered using Bailey's Usability Testing

Table 2  
Test Statistics for Students Who Took Both the Pretest and Posttest

Played Game?	Pretest		Posttest		<i>t</i>	<i>t Prob.</i>	Effect Size ( <i>d</i> )
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>			
Yes (N = 27)	23.78	4.34	26.37	3.73	4.71	< .001	0.65
No (N = 47)	21.13	4.60	22.51	4.34	2.75	.008	0.31

One problematic aspect of the results shown in Table 2 is that the experimental and control groups also differed markedly in their pretest means. The group that played the game had a much higher pretest score than the group that did not play the game. This complicates interpretations of the results, because the large differences in posttest performance are to some extent confounded by the pretest differences. To address this issue, an analysis of covariance (ANCOVA) was performed on the posttest scores, with pretest scores used as a covariate. The assumptions of the ANCOVA model (homogeneity of variance and homogeneity of regression) were found to be satisfied in the analysis. The results showed that the adjusted posttest scores were higher for the group that played the game (mean = 25.27) than the non-game group (mean = 23.14). This difference was statistically significant ( $F(1,71) = 8.69, p = .004$ ) and corresponded to an effect size of .74 standard deviations. Thus, even when there was control for the differences in pretest scores, the group that played the game substantially outperformed the group that did not.

Environment (UTE) to display the questions and record the answers, and Morae™ was used to record the search sessions. A convenience sample of five undergraduate students completed the test protocol. The protocol for the test was as follows:

1. Ask the user to search in Academic Search Complete for articles on the topic "Does eating cruciferous vegetables prevent cancer in women?" Ask whether the user is satisfied with the results.
2. Ask the user to search in Academic Search Complete for articles on the topic "What kind of pollution occurs in water sources near paper mills?" Ask whether the user is satisfied with the results.
3. Ask the user to search in Academic Search Complete for articles on the topic "What is the average wage for a construction worker in the United States?" Ask whether the user is satisfied with the results.
4. Ask the user to search in Academic Search Complete for articles on the



- topic “Is child abuse more likely to occur in families living below the poverty line?” Ask whether the user is satisfied with the results.
5. Ask the user to play the *Magnetic Keyword* game to identify the keywords in at least 4 search phrases.
  6. Ask the user to search Academic Search Complete for the topic “Does recreational reading improve grades?” Ask whether the user is satisfied with the results.
  7. Ask the user to search Academic Search Complete for the topic “Is there racism in American colleges?” Ask whether the user is satisfied with the results.
  8. Ask the user to search Academic Search Complete for the topic “How prevalent is post-traumatic stress among Iraq war veterans?” Ask whether the user is satisfied with the results.
  9. Ask the user to search Academic Search Complete for the topic “What diseases are affected by volcanic eruptions?” Ask whether the user is satisfied with the results.
  10. Ask whether the user would describe the game as fun (on a scale of 1-10 with 1 being the least fun and 10 being the most fun).

11. Ask whether the user would recommend the game to a friend (yes or no).
12. Ask what the user would do to improve the game (fill in the blank).

The data was analyzed by viewing the video recordings of the students working through the test protocol and recording the amount of time between initiating the searches and indicating satisfaction with results. The time each student spent searching in the database decreased in each player after they played the *Magnetic Keyword* game. For the first search, the average time it took for students to register satisfaction with their results was 184 seconds. For the final search, the average time between searching and satisfaction was 55 seconds. Figure 3 below represents the average search time for the eight search tasks described above.

### Discussion

Each experiment described above included several survey questions to determine whether the students who participated found the activity to be fun. Because fun is an intrinsic motivator, a game that can simultaneously educate and entertain is a powerful tool. Students who played the *Citation Tic Tac Toe* game described it as “a nifty program” and “a fun way to practice the information.” Several student evaluators offered suggestions on how to make the game more useful, including increasing the number and types of citations

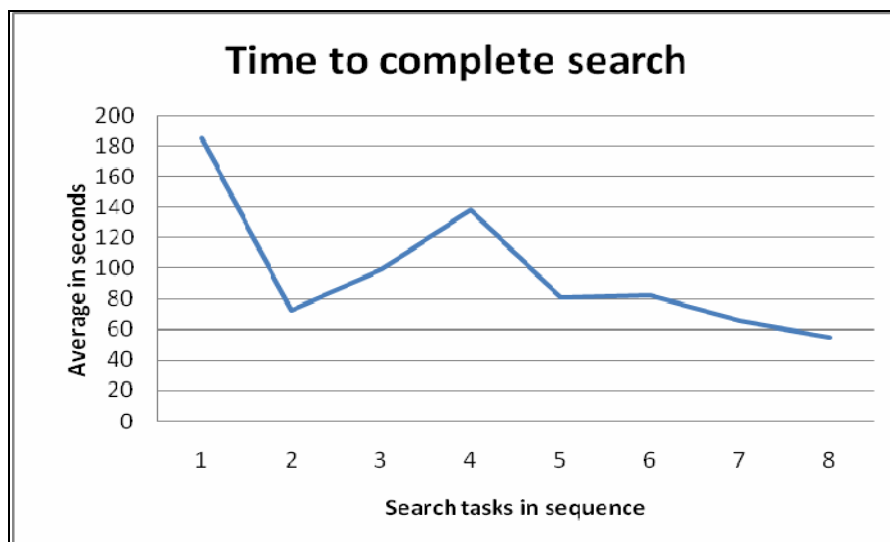


Fig. 3. Average Search Time per Task

and creating a pre-play tutorial. Comments indicated that students enjoyed the game as it helped them achieve the goal of correctly identifying citations, a skill they realize they must master. Because of the simplicity of the interface and gameplay, it is unlikely that any student would play it solely for entertainment.

Comments on the *Magnetic Keyword* game indicated that students found it to be moderately fun, with three players answering the question related to recommending the game to a friend affirmatively and two negatively. In keeping with the sentiments expressed for the *Tic Tac Toe* game, one player wrote "...I think the game has been made as fun as possible." Several players indicated that they would prefer more challenging search phrases. At the conclusion of one recording, a student is overheard saying, "Is that all? I want to search more which was interpreted as an endorsement of the "replay value" of the game. As a usability test, the results indicated that the game was highly usable, with no student experiencing navigation or game playing problems. This game could be further studied by integrating it into an advanced research and writing assignment and determining whether it aids students in their database searching skills in a "real-world" situation. The structure of the game is such that additional search phrase and distracter data can be added to increase the replay value or to create a subject specific game.

It should be noted that the *Magnetic Keyword* game is limited because most of the distracter words were randomly chosen and bear no relation to the correct keywords. This made it easier than necessary for players to make the correct choices. One way to make the game more challenging while reiterating the keyword concept would be to include more word variations instead of random unrelated words as distracters. For example, in the search where the phrase is "Do students who participate in sports get higher grades?" the distracters could include words like grading, graduate, graded, study, etc. Carefully chosen distracters could demonstrate the value of

truncating keywords. An additional limitation of the research design is the fact that students likely improved their familiarity and skill with the Academic Search Premier database during the course of the test. A more thorough test could use several different databases with different interfaces for comparison.

The experience of creating and studying two different kinds of games demonstrates that games can prove effective for learning certain kinds of skills. Reflection on the processes involved reveals that the most interesting learning occurs when the game in use is an analogy for a skill, as opposed to simply using the game to deliver new content. Future investigation into the use and study of games as analogies for specific skills, such as that conducted by Steinkuehler and Duncan (530-543), would reveal the pedagogical value of commercial games, obviating the need for the intense design-assessment cycle in which educational game designers must currently engage. Because commercial games are a for-profit business, the resources and talent they attract is unmatched in academia. The future study of games in higher education should concentrate on exploring how commercial games teach and how best to integrate them into our curricula, rather than on designing new games.

## Conclusions

This research found that it is possible to design games that are both fun and effective in imparting educational skills. A game-like approach is one that integrates graduated levels of expertise, new powers, and rewards with subject-specific content. The games described here integrated game-like approaches with identification of bibliographic citations and isolation of keywords from search phrases. Games that attempt to teach new skills are easier to design and measure than games that attempt to cultivate new behaviors. Reflection on the time spent developing and analyzing the games compared to studies of the novel uses of existing games leads the authors to conclude

that the latter approach is more efficient and richer with research possibilities.

In considering how to integrate games into education, it is wise to heed the adage that "everything looks like a nail when all you have is a hammer." Some situations lend themselves well to a game approach, while others may not. Sara deFrietas states that "...games and simulations can effectively support learners with skills-based needs (such as literacy and numeracy)" ( 249-264) an assertion that is confirmed in both the creation and the study of the *Tic Tac Toe* game.

Citation identification is a discrete skill, one which can be learned effectively by using the game.

As noted earlier, constructing effective search strategies is more an art than a science. To be a good searcher one must be familiar with a variety of databases and their unique thesauri, the lexicon of the search topic, the conventions of research of the field, and even the places where the relevant scholarship is being conducted. Scholarly literature published in languages other than English presents unique challenges to English-only speakers. Moreover, there is a certain element of creativity involved in searching, as a dose of curiosity and bravery are required to experiment with word combinations. All of these are characteristics that develop with time, experience, failure, and maturity. To assume that the ability to be an artful searcher can be deconstructed in the same way as the identification of citations can is naïve and potentially offensive to the scholars who produce the work being searched.

In her introduction to the *World of Warcraft* study, Constance Steinkuehler astutely referred to Henri Poincare's quote, "Science is built up of facts, as a house is built of stones; but an accumulation of facts is no more science than a heap of stones is a house." (Steinkuehler and Duncan 530-543). The main challenge librarians face as they attempt to impart the skills that students need to be competent researchers lies in guiding them to make meaning of the information they find.

In approaching the myriad of challenges of teaching research in an ever more complex environment, wise librarians will differentiate between what students must know absolutely and what skills must be developed incrementally, and choose approaches accordingly. Successful games can be designed that include the intrinsic motivator of fun, but care should be taken to avoid the implication that all learning *must* be fun.

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WPI Media Relations. "WPI Students Create Online Game to Simulate Massachusetts

Appendix

Citation Tic Tac Toe Pre/Post-test

**Citation Test**

Identify the type of publication for each citation below. Mark the correct answers on a form provided. Do not write your name on this sheet or the card, please use your peoplesoft number only on the form provided.

1. Fraser, K. (Ed.). (2005). *Education development and leadership in higher education : Developing an effective institutional strategy*. London ; New York: RoutledgeFalmer.  
**A--Book**  
B-- Journal article  
C-- Magazine article  
D--Chapter or article in a book
  
2. King, Jacqueline. "Academic success and financial decisions: Helping students make crucial choices." *Engaging the First-Year Student*. Ed. Robert Feldman, Mahwah, NJ: Lawrence Erlbaum, 2005. pp. 3-25.  
A--Newspaper article  
B--Book  
C--Government publication  
**D--Chapter or article in a book**
  
3. Flea Beetles. (2006, April). *Horticulture*, 103, 16.  
A--Government publication  
B--Book  
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