How Alice Game Templates Support Student Learning

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ABSTRACT
The use of review is a recommended method for reinforcing student understanding of new knowledge. Regular review and reinforcement help solidify these skills, so students can quickly draw on them during tests. And yet, is there any classroom activity quite as tedious and boring, for teacher and student alike, as review and reinforcement? Fortunately, review and reinforcement need not be as tedious as they sound. This paper will share one how Alice game templates maybe used by classroom teachers from all content areas to add some excitement to those dreaded classroom reviews.

Categories and Subject Descriptors
K.3.1 [Computers and Education]: Computer Uses in Education – computer-assisted instruction (CAI).

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Human Factors, Experimentation, Performance

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1. INTRODUCTION
It is said that “Practice makes perfect”—there is more than a hint of truth to this old adage. A proven method for helping students retain important skills is, for lack of a better label, “Review and Reinforcement.” Regular review and reinforcement help solidify these skills, so students can quickly draw on them for test time. [5] And yet, is there any classroom activity quite as tedious and boring, for teacher and student alike, as review and reinforcement? [4] Adding a little fun to review time can produce positive results.

2. GAMES AND STUDENT LEARNING
The use of games to promote learning is supported in the literature on student learning. Marzano, Pickering, and Pollock identify a number of instructional strategies that promote student learning. For each strategy, they also suggest ways to integrate technology to augment the learning process. For example, they advocate the use of review games, such as a PowerPoint version of Jeopardy, to support students’ homework and practice activities. [6] Self-assessment activities, such as subject-based review games, allow students to take greater ownership of their own learning. [1]

Since computer games are the most interactive and fun of all digital media [8], they are the perfect venue for adding some zing to review and reinforcement lessons. “Computer games...[are] designed to be read, to be watched, to be listened to, but also to be manipulated in ways the designer/author had anticipated and also had never anticipated.” [8] Is it any wonder then that games can spice up review and reinforcement lessons by reviving interest, interjecting the element of fun, and involving the user at such a level that retention of content is nearly ensured?

Marc Prensky makes it clear that gaming is now a way of life. [7] “Today’s schoolchildren, elementary through college, travel with their own personal Game Boys, ..., cell phones, portable CD and MP3 players, pagers, laptops, and Internet connections.” [2] It was only a matter of time until digital games came to school. Quite simply, games motivate because they are fun. Additionally, games are versatile and can be effectively used to teach, review, and/or reinforce almost any subject or skill.

3. ALICE & GAME-BASED LEARNING
Upon experimenting with Alice, it became obvious to the first author that it could be used for more than teaching or doing “programming.” Alice is a perfect tool to use to create educational games. Alice is ideal, not only because the resulting virtual worlds can be fascinating and engaging to the learner, but also because the worlds are relatively easy to create for novices.

After creating and using several Alice games for a review session whose content was computer programming, a new idea developed. The challenge became “How to provide all content-area teachers with games that are easy to edit?” The answer would unite specific educational content with computer games. The solution was easy—create gaming templates.

The web is full of gaming templates that are PowerPoint based. Three come to mind: Hollywood Squares, Who Wants to be a Millionaire, and Jeopardy. However, these templates are two-dimensional displays, use advanced features within PowerPoint, and require advanced programming skills to incorporate greater functionality. Using Alice, on the other hand, would allow the creation of three-dimensional games that could take advantage of programming benefits without a need for advanced programming skills. More importantly, the games could be used to illustrate programming concepts in the course.
The first author has designed and developed numerous Alice gaming templates over the past several months, since completing a professional development program at Purdue University in July 2008 named SPIRIT 2008 (Surprising Possibilities Imagined and Realized through Information Technology). [3] A group of twenty-four teachers completed the two-week summer SPIRIT program in July 2008. The program provided them with hands-on instruction on Alice which could be applied to any subject-area classroom. Each teacher was expected to develop three, Alice-based classroom lessons which would then be used during the subsequent school year. SPIRIT also included four in-service meetings where teachers returned to the Purdue campus to report on progress of their Alice-based classroom lessons and impact of those lessons on student learning.

3.1 The Game Templates

3.1.1 Background
At the first SPIRIT in-service meeting, the first author shared an Alice game template she developed for her class. When the other teachers were asked to provide input for the agenda for the second in-service meeting, several teachers requested instruction on how they could use the Alice-based game templates. At the next two in-service meetings, the first author offered instructional sessions on different game templates that the teachers could easily modify to support instruction in their respective subject areas. The response to these game templates by the teachers participating in these in-services has been overwhelmingly positive. The remainder of this section provides a brief summary of the game templates created thus far.

3.1.2 Vocabulary Jeopardy
All subject areas include a list of special terms that students need to memorize. Vocabulary Jeopardy is a game template that teachers in any subject area can use to add vocabulary words and correct, corresponding definitions. The game is played similarly to Jeopardy on TV; however, there are only two teams/players, not three as on TV. The game begins by the current player selecting a category and a dollar amount. Next, a definition appears. The player must name the correct vocabulary word. If a correct response is given, then the dollar amount is added to player's total.

3.1.3 Hollywood Squares
Teachers in most subject areas who use multiple choice or true/false quizzes can think about offering some variety using the Hollywood Squares game template. Teachers add questions from their content area and possible answers into the template. To play the game, the student selects a square. The question and a possible answer appear. The student then agree or disagrees with the possible answer. As played in the television-version of the game, if the student responds correctly, s/he gets the X or O. If s/he responds incorrectly, the opponent gets the square. To win the game, the student must get 3 Xs or Os in a row.

3.1.4 Bull Fight
The Bull Fight game template was developed with foreign language teachers in mind, but it could also be used by English teachers. To set up the game, teachers add foreign language verbs (infinitive form) and possible subjects. To play the game, the student must conjugate the verb using the subject. If a wrong answer is given, the student (represented as a character in the world) is chased by a bull. If the answer given is correct, then music plays instead.

3.1.5 Basketball
The basketball game template is another tool to help students gauge their understanding of select vocabulary. It has been used by foreign language teachers. To set up the game, the teachers add pictures representing vocabulary words and the correct vocabulary words. When the game is played, a picture appears. Then a word (in the foreign language) appears. The student clicks a green basketball if the word correctly describes the picture or a red basketball if word does not describe the picture. The student is awarded points for correct answers.

3.1.6 Seven Rules
Seven Rules is another basketball-themed game that uses a very simple Alice world to teach seven or more rules about a select subject area. The rules are added by the teacher. Then the student is tested about the rules when s/he plays basketball. An example word or phrase is displayed. If the word or phrase correctly applies the rules, the student clicks the green basketball. If the word or phrase does not correctly apply the rule, the student clicks the red basketball. The student is awarded points for correct answers.

3.1.7 Whack-A-Mole
The Whack A Mole game template is a world that is still in progress, but it will be complete very soon. To set up the game, the teacher enters questions each with four multiple choice answers and the letters of the correct answers. To play the game, the student will see a question and four multiple choice answers. If s/he answers the question correctly, s/he will get a chance to play a game similar to the carnival game of Whack-A-Mole. Moles pop out of holes and the student has to “whack” them before they go back in. The game ends after all moles have been “whacked.”

3.1.8 Space Frogger
The reader may have grown up with a two-dimensional, black and white version of Frogger on the old TRS-80. Space Frogger, however, is a new take on that old game. This version takes the original concept of a frog and lily pads and adds the intrigue of outer space. This game starts with one frog sitting on the launch pad. The player must guide the frog over the chasm of deep space by jumping from a moving flying saucer to the next flying saucer. If the player successfully maneuvers the frog to the finish line (the Mother Ship), a randomly-selected question and four possible answers appear. The option to continue the game and to earn more points is contingent upon answering the question correctly. Although this action-packed version of Space Frogger has great three-dimensional graphics, appropriate sounds and music, and adjustable flying saucer speeds, the multiple choice review questions take center stage.

Space Frogger is a fun activity that can be used in a variety of settings to review any subject matter at any skill level. Additionally, this Alice game template is easily manipulated by the teacher. No programming experience is needed to add content-specific questions and answers. Space Frogger is the most popular of the gaming templates presented at Purdue in-service meetings. It is also the undeniable favorite of the first author’s high school students.

A copy of the Space Frogger template and the User Manual will be available at the end of the conference presentation of June 17, 2009. (Note: The User Manual provides step-by-step detailed
instructions for editing the questions and answers of the Space Frogger game template.)

1. CONCLUSIONS
Using Alice-based game templates is only one of many instructional strategies that today’s teachers may use to combat student indifference during review and reinforcement lessons. This teaching strategy is supported by research that shows that games have “considerable success when designed to address a given problem.” [2] Perhaps once teachers witness the interesting blend of learning and fun that games can offer, they will seek out additional carefully-designed games or develop new games themselves.

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3. REFERENCES