

Content on the Plotline: Designing Educational Games for Social Studies

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Abstract: This paper discusses two short educational games designed and developed at the Ateneo de Manila University for Grade 6 and 7 Social Studies. The games will be evaluated in relation to three major characteristics of effective educational game design: integration of the content on the game's plotline, support of game play through feedback and hints, and extension of learning through off-line activities.

Keywords: Educational games, role-playing, social studies, Philippines, middle-school, Ateneo de Manila

Introduction

Computer-based instructional materials have been shown to increase student motivation, decrease time-on-task, and increase transfer of learning [3]. Computer-based educational games in particular can be enjoyable ways to learn. However, it is challenge for educational technologists to design applications that deliver an instructional message in an effective and engaging manner.

This paper discusses two short educational games designed and developed at the Ateneo de Manila University for Grade 6 and 7 Social Studies. The games will be evaluated in relation to three major characteristics of effective educational game design discussed by Fisch [4]: integration of the content on the game's plotline, support of game play through feedback and hints, and extension of learning through off-line activities.

1. Characteristics of Good Educational Games

Games are defined as intrinsically motivating, voluntary activities that involve some elements of fantasy or make-believe [1]. They are beneficial because enhance learning through visualization, experimentation, and creativity of play. They foster critical thinking in that the player must analyze and evaluate information in order to make game choices. But how do we make educational games "educational?" Fisch [3] asserts that, to succeed at this goal, educational content must be well integrated into the game.

1.1 Content on the plotline

To Fisch [4], integration first involves placing educational content on the game's plotline. Students have to exhibit the targeted behaviors or exercise the targeted knowledge in the process of playing the game.

This is not equivalent to putting educational content on the computer screen. Many games are in fact attractive drill-and-practice exercises with a premium placed on seductive details—interesting but irrelevant material added to the educational application in order to

make the application more compelling and memorable [4, 7]. Although these applications are entertaining, they are no more beneficial than their paper-based equivalents [4]. Indeed, emphasis on seductive details can backfire, as students tend to remember these details rather than the educational content. Students may even come to regard the educational content as an obstacle they must overcome to reap amusing but non-educational rewards.

Integration means allowing students to manipulate or experiment with different aspects of the game in order to observe the consequences. Narratives have to weave in the knowledge or skills that the students are expected to master. Any challenges posed to the students—puzzles, obstacles, and so on—should not remove the students from the narrative or suspend the narrative, but rather help the narrative progress to the next level [4].

1.2 Feedback or help structures

Integration also requires providing feedback or help structures to guide students in the game. Feedback should go beyond telling students that answers were right or wrong. They should help the students understand the subject matter better and help guide students to the correct answers [3, 4].

Similarly, help systems should not automatically provide students with the correct answers. They should point students to the right direction or the next step. Ideally, the help system should have levels, with each level providing more help than the previous level. It should detect multiple requests for hints, implying that a student may be struggling with the subject matter [4].

1.3 Extension of learning through offline activities

Finally, integration requires the extension of learning outside the game, through ancillary materials. While games can introduce students to new concepts and ideas, ancillary materials can help crystallize the connection between these concepts and the real world [4].

These materials can include web sites, references, discussion questions, and other resources or activities that can spur discussion and engagement. They can be initiated by the students themselves as a spontaneous response to the subject matter. They can also be planned activities conceived by the game designers themselves [4].

2. Social Studies Education at the Ateneo de Manila University.

Founded in 1859, the Ateneo de Manila University a privately-owned, Jesuit university in Loyola Heights, Quezon City, Metro Manila Philippines. It has an all-boys grade school and high school and a co-educational university.

At the grade school level, Social Studies is required yet often disliked subject. The President's Report [2] summarizes the problem as follows:

The study of *Araling Panlipunan* (AP, or social studies) has always posed a difficult challenge to teachers who have to deal with the impression that it consists of tedious memorization of facts, events, and dates presented in an uninteresting manner.

This situation is unfortunate because AP is one of two subjects (the other being Filipino, the national language) in the curriculum that teaches about the Philippines. The teachers and administrators of the Ateneo were of the opinion the negative regard that students had for the AP subject spilled over to their regard for the country as a whole. A variety of instructional strategies and interventions have been used to address this situation.

Among these strategies was the use of information technology, particularly the use of computer-aided instructional modules.

By infusing AP with technology, educators hoped students would enjoy some benefits associated with technology in education. If AP were more interesting, motivating, and engaging, perhaps students will learn to love the subject and, by proxy, learn to love the Philippines. Hence, the broader goal of the development of these modules was not to teach facts and figures but to cultivate love of country.

In 2003, a grant from the University's president enabled the Ateneo Grade School and the Department of Information Systems and Computer Science of the college to organize a design and development team to craft 16 computer-based educational learning modules for Social Studies [2, 7]. All modules developed were curriculum-based. They followed the learning goals prescribed by the Ateneo Grade School. The modules were multimedia, using text, graphics, animation, audio, and video as needed. The modules were brief. Each was only designed for 20 minutes of contact time with the students. The modules were supplementary in nature. They were not intended to replace textbooks or other traditional learning materials. Rather, they were meant for enrichment and variety. Finally, the modules were interactive. Students used them on a one-on-one basis. Students paced themselves through the material and responded to questions posed by the material independently.

The development of the software followed the instructional development lifecycle discussed by Fenrich [3]. Briefly described, this process began with the identification of learning goals and an analysis of learner characteristics. An instructional strategy was designed. Resource materials were collected and the modules were authored using an appropriate tool. As the modules were developed, they were periodically reviewed by the project proponents and the faculty. Once the modules were approved, they were fielded into the classrooms.

The modules were designed as integral parts of learning activities that spanned two to three class periods. The students first had to listen to a teacher-led lecture on the topic. After the lecture, possibly during the next class period, the students were escorted to the computer laboratory. Each student was assigned to a computer in which the software was installed. The teacher gave the students brief instructions on how to navigate through the software and then asked the students to use the software for about 20 minutes. After the computer-based activity, the class was engaged in an integrative discussion about the subject matter.

While most of these modules used tutorial or electronic storybook approaches, several ventured into the educational game genre. This paper discusses two of the modules that took an educational game approach: *A Day in the Life of the Delfin Family: A Story of Globalization in Everyday Life* and *Investigation on War as a Barrier to Peace: An Editorial*. The two games were designed following a constructivist philosophy. Technology was not used to deliver an instructional message to a passive learner, as with slide shows or page-turning applications. Rather, technology was used to engage learners actively in the processing of information while addressing authentic issues, in order to construct personal and shared meaning [5]. These two games are the subject of this paper.

3. A Day in the Life of the Delfin Family: A Story of Globalization in Everyday Life

The educational goal of *A Day in the Life of the Delfin Family: A Story of Everyday Life* is to teach students about globalization and its effects. Globalization is defined as the phenomenon of interconnectedness in which events in one part of the world affect circumstances in another. Grade 6 students learn that we encounter globalization every day.

Even the mundane and ordinary choices we make are reflect globalization.

The plot begins with a family of four, Mr. Delfin, Mrs. Delfin, son Roy, and daughter Irene, on a trip to the mall to make use of two thousand pesos worth of gift certificates (See Figure 1). In the narrative, the student learns that each family member wants to buy something: Mrs. Delfin wants to buy a plant. Mr. Delfin wants to buy shoes. Roy wants a computer game and Irene wants a book. They also have the option of having a meal, seeing a movie, or making a donation to a charitable organization. A shopping list appears on the right-hand side of the screen representing each item the family wants or can do (See Figure 2). The student chooses which items to buy and in what order. When the student makes a choice, the peso amount corresponding to that choice is deducted from the family's remaining funds. The game ends as soon as the family runs out of money.



Figure 1: Start screen of the game.



Figure 2. Mall directory and items that the family wants to buy

3.1 Content on the plotline

When a family member is confronted with choices, the student must decide which of the choices the family member will select. As the student examines choices, the family engages in a non-judgmental dialogue regarding the options. The family never directly mentions the word “globalization” but their comments imply globalization’s effects.

For example, in Figure 3, Mrs. Delfin must choose which plant she wants to buy. She chooses from an orchid, a lily, and a bromeliad. The family comments that the orchids from Bangkok are cheaper than the orchids from those that are locally grown. Roy asks his father why that is so. He always thought that local products were less expensive than imported products. Mr. Delfin explains that this is not always the case. Because some countries are more efficient producers than others, they can afford to sell their products at lower prices.

In another scene, Roy buys his computer game (See Figure 4). Irene chides him, “Why don’t you just download it from the Internet?” Roy explains that the game has to be registered online in order to work. If the registration code is illegal or invalid, the game will not run.

Finally, when the family decides to donate some money to charity, they notice that many of these organizations have international linkages (See Figure 5). One foundation collects money for earthquake victims in other countries. Irene recalls that she heard the news about the earthquake on CNN. One foundation brings in scientists from abroad. Still another is funded by an organization in the United States. By presenting globalization in this manner, the Ateneo Grade School hopes to develop the students’ sensitivity to the existence of globalization even in day-to-day choices.



Figure 3. Plant choices.



Figure 4. Roy buying his computer game.



Figure 5. Donations to charity organizations.

3.2 Feedback or help structures

The module's feedback and help are very simple. The student dictates the order in which the family's activities take place. None of the choices are right or wrong. The family's conversations draw the student's attention to globalization in each scenario.

Once a student has already purchased an item, the item disappears from the shopping list. If the student attempts to revisit a section of the store, the family advises the student to make another selection.

3.3 Extension of learning through offline activities

The topic of globalization lends itself to many off-line reflections and discussions. The Ateneo Grade School engages the students in several activities to extend learning about globalization. They ask students to bring their favorite possessions to school and identify where they were made. They are asked to name their favorite television shows and favorite foods. They are also asked to identify a particular event in the world, its immediate and remote causes, and its effects on the national situation as well as on individual lifestyles (H. Amante, personal communication).

4. Investigation on War as a Barrier to Peace: An Editorial

The second module was a role-playing game entitled *Investigation on War as a Barrier to Peace: An Editorial*. As an institution, the Ateneo Grade School is committed to peace. Its definition of peace is not limited to the absence of open conflict, but rather to a state in which people have quality of life. The Ateneo is firmly committed to non-violence and believe that peaceful means must be exhausted before resorting to violent conflict. A large

portion of the Grade 7 Social Studies curriculum is devoted to peace education. This module’s educational objective is to familiarize students with some of war’s negative effects.

4.1 Content on the plotline

The student plays the role of a rookie reporter who has to write editorials on three fictitious breaking news stories (See Figure 6). For example, the student is informed that the United States just declared war on Palestine. The student must then consult with four sources of information: the government, the military, foreign intelligence sources, and popular opinion (See Figure 7). As the student consults the resources, he learns about the negative effects of war. For example, many Filipinos are against the war because they have relatives working in the Middle East and they fear for these relatives’ safety (See Figure 8).

The student then publishes an opinion on the matter by selecting from three varying, pre-made opinions on the matter. One condemns the war. One focuses on bringing Filipinos working in the Middle East back home. One enjoins the government to send troops to fight in the war (See Figure 9).



Figure 6. The module’s opening screen.



Figure 7. Information sources



Figure 8. An example of popular opinion.



Figure 9. Close-up of an opinion.

Although the scenarios are fictitious, the effects of war are factual and the concerns raised by different parties are based on actual policies or responses to similar, real events. For example, in one other scenario, there are concerns raised about nuclear weapons being stored on local military bases. The information sources reveal that the Philippines is, as a

policy, against the stockpiling and use of nuclear and other weapons of mass destruction. The information sources also discuss some of the effects of nuclear detonations, including massive loss of life and irradiation of the environment.

4.2 Feedback or help structures

As with the globalization module, this module has no right or wrong answers. Once the student selects an opinion for publication, the student receives the result of an opinion poll (See Figure 10). The national government, foreign governments, and the public express their approval or disapproval of the opinion published. It is not possible to satisfy all parties. Indeed, there will always be at least one party that will be unhappy with the opinion. However, it is not the objective of this module to please everyone. The module's objective is to encourage an orientation towards peace, no matter who is pleased or displeased.



Figure 10. Feedback from different sectors

The module provides only a limited amount of help. A guide in the person of Julie, the office manager, provides verbal instructions at every stage of the game. If the student clicks on Julie, she simply repeats the audio. If the student attempts to publish an opinion without first consulting all the information sources, Julie reminds the student to consult the sources first.

At the end of the module, Julie congratulates the student on publishing three opinions, regardless of how popular or unpopular they were. She reminds the student to always check the facts first before venturing an opinion, that it will never be possible to please everyone, and to always look for a peaceful solution to any conflict.

4.3 Extension of learning through offline activities

To enrich the learning experience, the students are asked to analyze the opinions that they published and to explain why various sectors reacted as they did. They are asked whether they believe that the reactions of these sectors are rational or not. Students are asked to reflect on the fictitious events depicted in the module. They are asked what characteristics and consequences make war undesirable. The answers to these questions may be written in their notebooks or discussed in class.

5. Evaluation

The project proponents have been able to gather feedback regarding the globalization

module through classroom observations. The classroom observations revealed a high level of engagement among the students. They listened to the software, responded to the questions, and explored the content. In the subsequent discussion, students were able to accurately answer the teacher's questions about the software's content, e.g. what is globalization? They were able to give examples of the Delfin family's encounters with globalization. They were also able to give examples of globalization in their own lives.

As of the time of this writing, the project proponents have not yet observed the use of the war module. Surveys and interviews of both teachers and students have been conducted to gather feedback regarding the modules in general. However, this feedback will not be discussed in this report because it was not specific to the modules discussed here.

6. Conclusion

These modules were simple in plot and flow yet they implemented Fisch's characteristics of educational games, most notably content on the plotline and extension of learning through off-line activities. The feedback and help systems need further improvement.

The modules were also able to implement several constructivist principles. They engaged students in active learning by giving students some level of control over the environment and the outcomes of the games. Students participated in knowledge construction. The follow up activities gave students a venue to articulate what they learned and reflect on the implications of this knowledge on the larger community. Finally, students were immersed in an authentic environment with complex, ill-structured problems with no clear solutions or correct answers.

The author believes that the modules should undergo systematic evaluation to gather feedback from both students and faculty. The current feedback, although positive, is too limited.

If these modules were to be revised or if similar modules were to be developed, this paper recommends greater authenticity in the scenarios. It would be also be beneficial to include a more robust and dynamic feedback and help system.

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