INTEGRATION OF GAME-BASED LEARNING INTO A SOCIAL STUDIES CURRICULUM MODEL TO IMPROVE STUDENT PERFORMANCE IN THE OHIO SOCIAL STUDIES STANDARDS

John C. Findling

A Thesis
Submitted to the Graduate College of Bowling Green State University in partial fulfillment of the requirements for the degree of

MASTER OF EDUCATION

August 2008

Committee:
Dr. Terry Herman, Advisor
Dr. Donna Trautman
Dr. Gary Benjamin
ABSTRACT

Dr. Terry Herman, Advisor

A deficit exists in Ohio high schools students’ performance on the social studies section of the Ohio Graduation Test (Ohio Department of Education, 2007b). In this thesis, the researcher has studied and proposed a curriculum model integrating gaming into the social studies curriculum, with the purpose of aiding students on the social studies section of the Ohio Graduation Test.

Digital game-based learning has been endorsed by many expert supporters as an effective learning tool. However, little research has been conducted to explore how to implement a pedagogically-sound digital game-based learning model into an existing curriculum (Van Eck, 2006). Digital game-based learning may be the solution to engaging today’s students who are unengaged in the classroom but engaged by nearly every other aspect of their lives (Prensky, 2005).

To assess the validity and potential success of the curriculum, the researcher presented a series of questions to an expert panel comprised of a subject matter expert, curriculum specialist and gaming expert. This study is one step in garnering a body of knowledge and research to support integration of digital-game based learning into K-12 curriculum to reinforce student learning.
I dedicate this to my parents John and Karen, my brothers Matt, Aaron and Ryan, my fiancée Lindsay, my sisters-in-law (future and current) Karen, Regan and Holly, my grandparents John and Virginia, my goddaughter Julia, my nephew Brian and my new, unborn niece or nephew (congratulations Matt and Karen!).
ACKNOWLEDGMENTS

I would first like to thank my wonderful fiancée Lindsay whose dedication has driven me to strive for greatness, whose work ethic has guided me towards my furthered education and whose support has kept me sane through the stressful nights and procrastinated projects.

I would also like to thank Dr. Terry Herman who has been so helpful and caring throughout the whole process of graduate school and writing this thesis. Terry has been a spectacular teacher, friend, mentor, advisor and occasional psychiatrist through everything. In addition, I would like to thank the rest of my committee – Dr. Donna Trautman and Dr. Gary Benjamin – and all of the other teachers, co-workers, advisors and mentors that have made themselves available, considerate resources to students such as me. Next, I would like to thank the members of my expert panel who so graciously offered the professional insight necessary to finish this study.

Furthermore, I would like to thank all of my family and friends that have helped me become the person I am today. I also think my cats Callie and Chloe deserve a ‘shout-out’ for being hilarious, annoying reminders of life and the future family Lindsay and I will create.

Lastly, I would like to thank the many brilliant minds and caring hearts in education who keep forging forward towards an engaging, effective, up-to-date and relevant educational system accommodating enough to educate anyone.

Thank you.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER I. INTRODUCTION</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context of the Problem</td>
<td>1</td>
</tr>
<tr>
<td>Games for Young-Adults</td>
<td>1</td>
</tr>
<tr>
<td>Digital Game-Based Learning</td>
<td>1</td>
</tr>
<tr>
<td>Ohio Graduation Test</td>
<td>2</td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td>2</td>
</tr>
<tr>
<td>Objective</td>
<td>3</td>
</tr>
<tr>
<td>Problem</td>
<td>3</td>
</tr>
<tr>
<td>Description of the model</td>
<td>3</td>
</tr>
<tr>
<td>Audience</td>
<td>5</td>
</tr>
<tr>
<td>Significance of the Study</td>
<td>5</td>
</tr>
<tr>
<td>Assumptions</td>
<td>6</td>
</tr>
<tr>
<td>Delimitation</td>
<td>6</td>
</tr>
<tr>
<td>Definition of Terms</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER II. REVIEW OF LITERATURE</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Today’s Learners and Digital Game-Based Learning</td>
<td>8</td>
</tr>
<tr>
<td>Serious Games</td>
<td>11</td>
</tr>
<tr>
<td>Civilization IV</td>
<td>15</td>
</tr>
<tr>
<td>Age of Empires II: The Age of Kings</td>
<td>17</td>
</tr>
<tr>
<td>Rise of Nations</td>
<td>18</td>
</tr>
<tr>
<td>Ohio Graduation Test</td>
<td>19</td>
</tr>
</tbody>
</table>
Curriculum Development and Instructional Design .................................................. 28
Summary ............................................................................................................. 31

CHAPTER III. METHODOLOGY ............................................................................. 32
Introduction ........................................................................................................ 32
Purpose ............................................................................................................. 32
Research Design ............................................................................................... 32
Information Gathering ......................................................................................... 35
Expert Panel ..................................................................................................... 35
Timeline ........................................................................................................... 37

CHAPTER IV. FINDINGS ....................................................................................... 38
Educational Objectives ....................................................................................... 38
  History .......................................................................................................... 38
  People in Societies ....................................................................................... 43
  Geography .................................................................................................... 45
  Economics .................................................................................................... 48
  Government ................................................................................................. 50
Results ............................................................................................................. 52

CHAPTER V. CONCLUSIONS, SUMMARY, RECOMMENDATIONS .................... 59
Conclusions ...................................................................................................... 59
Summary .......................................................................................................... 59
Recommendations ............................................................................................ 61
REFERENCES ..................................................................................................... 63
APPENDIX A. OHIO GRADUATION TEST GUIDE SELECTED PAGES ............ 66
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>Industrialism Technology</td>
<td>40</td>
</tr>
<tr>
<td>Figure 2</td>
<td>Scenario Selection Screen</td>
<td>42</td>
</tr>
<tr>
<td>Figure 3</td>
<td>Relations Spoil</td>
<td>44</td>
</tr>
<tr>
<td>Figure 4</td>
<td>Andes Mountains</td>
<td>46</td>
</tr>
<tr>
<td>Figure 5</td>
<td>Jungle</td>
<td>47</td>
</tr>
<tr>
<td>Figure 6</td>
<td>Resources</td>
<td>48</td>
</tr>
<tr>
<td>Figure 7</td>
<td>State Property Economic Civic</td>
<td>50</td>
</tr>
<tr>
<td>Figure 8</td>
<td>Representation Government Civic</td>
<td>51</td>
</tr>
<tr>
<td>Figure 9</td>
<td>Police State Government Civic</td>
<td>52</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quinn’s Necessary Attributes of a Successful Serious Game</td>
<td>13</td>
</tr>
<tr>
<td>2</td>
<td>Civilization IV Critical Rating and Awards</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>Age of Empires II: The Age of Kings Critical Rating and Awards</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>Rise of Nations Critical Rating and Awards</td>
<td>19</td>
</tr>
<tr>
<td>5</td>
<td>Gagne’s <em>Nine Events of Instruction</em></td>
<td>28</td>
</tr>
<tr>
<td>6</td>
<td>Timeline for Curriculum Development</td>
<td>37</td>
</tr>
</tbody>
</table>
CHAPTER I. INTRODUCTION

Context of the Problem

Games for Young-Adults

Video games are for kids! Not such an old expression, yet one that belies the rich potential for digital learning games for all ages. At inception, video games were generally targeted towards children. Now, “the average game player is 33 years old,” “24 percent of Americans over the age of 50 play… video games” and “sixty-seven percent of American heads of households play computer and video games.” What’s more, incongruous with popular belief, girls play video games too! Thirty-eight percent of women play video games (Entertainment Software Association, 2008).

Furthermore, video games in 1996 were an approximately three billion dollars per year industry. However, in 2007, video game sales more than tripled from 1996 to grow to a nine and a half billion dollars per year industry (Entertainment Software Association, 2008). With this staggering evidence, it becomes clear that video games are a medium that are fast gaining popularity among other forms of media such as music, movies and books, as a viable source of information and entertainment.

Digital Game-Based Learning

Though video games are available and used by many, digital game-based learning (DGBL) has experienced challenges in becoming an educational mainstay. Shaffer, Squire, Halverson and Gee (2005) found that “most educators are dismissive of video games. But corporations, the government, and the military have already recognized and harnessed their tremendous educative power. Schools have to catch up (p. 105).” Shaffer, Squire, Halverson and Gee (2005) go on to make the case that video games offer a unique learning experience wherein users learn in environments that integrate “thinking, social interaction, and technology, all in
service of doing things we care about.” Furthermore, players can “inhabit roles that are otherwise inaccessible to them” in new worlds (p. 105).

**Ohio Graduation Test**

In Ohio high schools, tenth graders are required to take the Ohio Graduation Test (OGT) as part of a state-wide standardized examination. The Ohio Graduation Test has, over the last few years, replaced the Ohio Ninth Grade Proficiency Test to become the standard exit-exam for Ohio high school students (Wikipedia.org, 2008d). The test consists of five parts, math, science, social studies, reading and writing, with science and social studies having the lowest results in 2005, 2006 and 2007. With as many as twenty-four percent of high school students being considered ‘below proficient’ on the social studies section of the Ohio Graduation Test, it is glaringly evident that the teaching environment in which students are learning, and not learning, needs renovation (Ohio Department of Education, 2007b).

**Statement of the Problem**

A deficit exists in Ohio high schools students’ performance on the social studies section of the Ohio Graduation Test (Ohio Department of Education, 2007b). In this thesis, the researcher has studied and proposed a curriculum model supplementing gaming into the social studies curriculum, with the intent of aiding students on the social studies section of the Ohio Graduation Test.

Digital game-based learning has been endorsed by many expert supporters as an effective learning tool. However, little research has been conducted to explore how to implement a pedagogically-sound digital game-based learning model into an existing curriculum (Van Eck, 2006). Digital game-based learning may be the solution to engaging today’s students who are
unengaged in the classroom but engaged by nearly every other aspect of their lives (Prensky, 2005).

Objective

The objective of this study was to explore digital game-based learning as a means of improving student scores on the social studies section of the Ohio Graduation Test. Furthermore, the objective included learning how to integrate a digital game-based learning model into an existing curriculum while making the model relevant to the curriculum.

Problem

The problem of the study was to develop a model integrating digital game-based learning to be used in the Ohio social studies curriculum to improve learner performance on the Ohio Graduation Test social studies section. The model was designed to be supplemented into current Ohio high school social studies curricula.

Description of the model

The proposed model which was used as a catalyst to strengthen high school social studies curriculums utilized digital game-based learning. The researcher analyzed three social studies-related off-the-shelf video games for use in this model: Civilization IV, Rise of Nations and Age of Empires II: The Age of Kings. Each of these games has been heralded as one of the best games of its genre and has received very high reviewer scores. It is with these recommendations and accolades that the researcher can concur that the use of one of these games in the proposed model would prove to be an engaging experience for students. Furthermore, the chosen game speaks to individuals’ competitive nature in volumes. The model used in high school social studies classes enlisted the students as rulers of unique civilizations alongside and against
classmates and/or computer players (non-human opponents or allies controlled by in-game artificial intelligence) in a digital game-based learning environment.

Civilization IV is a turn-based, strategy game in which the player leads a unique civilization through the ages, ancient through future, against other players or computer players in an attempt to achieve victory. Each age represents an era in world history through technologies, weaponry, governments, etc. Difficulty is represented mostly by the skill levels of the other players and the adjustable difficulty level that controls how smart and aggressive the computer players are. The victory conditions are dependent upon the scenario selected: but victory can generally be achieved through conquest, time, cultural, space race, domination, or diplomatic. Trade, war, discovery, technology, resources, culture, religion and diplomacy are commonplace in each game of Civilization IV and the best players utilize each. Civilization IV has a very accessible back-end in which users and developers can greatly customize scenarios to recreate historic events or create fictional events.

Age of Empires II: The Age of Kings is a real-time, strategy game similar to Civilization IV in many ways. The player takes control of one of the available, unique civilizations through a limited span of ages; Age of Empires II: The Age of Kings spans from the dark ages to the imperial age which is similar to the Renaissance. Furthermore, not as many civilizations are represented in Age of Empires II: The Age of Kings as in Civilization IV. Civilization IV has many civilizations worldwide represented while Age of Empires II: The Age of Kings is mostly represented by European civilizations. Lastly, many other aspects are similar to Civilization IV except that there are just fewer options.

Rise of Nations again is a real-time, strategy game very akin to Age of Empires II: The Age of Kings. The main difference is that the age span and civilization representation is more
similar to Civilization IV. However, trade, war, resources and technologies all play a major roll in achieving victory just as Civilization IV and Age of Empires II: The Age of Kings.

More detailed information is available later in this study for each of the games researched.

The proposed curriculum model consisted of students competing once weekly in an ongoing series of matches of the used game. Depending on the size of the class and the resources available, multiple games may have to be played in an overlapping manner due to the limit of players allowed in a single session at one time. Each week, one or a few student player(s) would be awarded a bonus of resources or units for exemplary performance or participation during class discussions, on homework assignments or on tests and quizzes. These added benefits encourage the students to be more engaged in class and add interest to the nuances of the game while aiding those who may lack the ‘gaming skills’ of his or her classmates. However, the real benefit of the used game would not come from its aid in-class, rather from the intrinsic learning benefits of playing the game.

Audience

The model was designed for Ohio high school students between the ages of 14 and 18 with the purpose of providing an engaging learning experience in social studies classrooms through digital game-based learning.

Significance of the Study

Data from this study has added to the current body of knowledge by taking the knowledge already developed and published related to digital game-based learning and synthesizing that data into a pedagogically-sound digital game-based learning model to help Ohio high school students on the social studies section of the Ohio Graduation Test.
Assumptions

For the purpose of this study, the researcher assumed that digital game-based learning can improve student learning performance and that the social studies curriculum and the Ohio Graduation Test are valid and reliable educational tools.

Delimitation

This study was delimited by the fact that the effect of the in-game rewards system mentioned in the Description of the Model section above was not researched or compared to a standard rewards system, or lack of thereof. The proposed rewards system had no impact on this study.

Definition of Terms

Presented in this section is a series of operationally defined terms. These terms are defined based on the usage within this document.

Civic: A term used in Civilization IV meaning a “system [that] allows you to customize your government with various civics options that are classified into five categories: Government, Legal, Labor, Economy, and Religion… Civics options are unlocked through research” (Civfanatics.com, 2006).

Digital Game-Based Learning: (DGBL) “is precisely about fun and engagement, and the coming together of and serious learning and interactive entertainment into a newly emerging and highly exciting medium — Digital Learning Games” (Prensky, 2001a, p. 5).

Mod: “…Bug fixes or minor design changes in hardware or software…” (Die.net, 1999).

Serious Games: “A serious game is a software application developed with game technology and game design principles for a primary purpose other than pure entertainment” (Wikipedia.org, 2008d).
Technologies: A Civilization IV term used to describe research objectives that can be obtained in-game that allow greater benefits. Technologies in Civilization IV are arranged in a tree-like manner so that later technologies, like gunpowder, cannot be researched until more primitive technologies, such as mining and iron working, are researched. Certain technologies make other buildings or technologies obsolete.
CHAPTER II. REVIEW OF LITERATURE

This chapter includes an exploration of the historical context, relevant theory and current literature pertaining to today’s learners, digital game-based learning, serious games, Civilization IV, Age of Empires II: The Age of Kings, Rise of Nations, the Ohio Graduation Test, curriculum development and instructional design. Each of the sections detailed above is critical to the study. Today’s learners are researched because of the amount of change that has occurred from learners years ago to learners today. Digital game-based learning is researched because the proposed model is a digital game-based curriculum. Serious games are researched because aspects of what a serious game is would have to be present in the chosen game for it to be a successful teaching aid. Each game is researched because the model was based around one of the games. The Ohio Graduation Test is researched because the curriculum is designed with the specific goal of aiding students with the Ohio Graduation Test social studies section. And lastly, curriculum development and instructional design are researched because the researcher must understand such to develop a pedagogically-sound model.

Today’s Learners and Digital Game-Based Learning

Today’s learners are enraged! Mark Prensky (2005) argues that students expect to be engaged in their everyday endeavors, including school, because of the amount of engagement in most other aspects’ of their lives. Today’s students “have something in their lives that’s really engaging—something that they do and that they are good at, something that has an engaging, creative component to it” (Prensky, 2005, p. 62). Today’s learners are engaged in every aspect of their lives by video games, digital messaging, the Internet, music, movies and sports… except in school! Furthermore, the learners are not being given the choices, customizable video games, ‘two hundred channels,’ ‘the entire world at your fingertips’ and customizable playlists on MP3 players, in school like they are in other aspects of their daily lives; the learners just have to
accept what is given to them (Prensky, 2005, p. 62). Prensky uses the expression “Yesterday’s education for tomorrow’s kids” (Prensky, 2005, p. 62). How fitting. Yet Prensky (2005) offers a consolation that these students can be engaged, they are already mastering very complex video games far more difficult than the subjects in school, they just need to be engaged like they are by their video games. Prensky declares that a digital game-based curriculum with good “gameplay” can truly engage students and still get across the concepts important to the already-in-place curriculums (Prensky, 2005).

Prensky (2001b) also extensively discusses how a human’s brain is ‘rewired’ to adapt to various settings in his article The Games Generations: How Learners Have Changed. Reading, language, radical change and sensory perception are all inputs that actually ‘rewire’ the brain based on input frequency and repetition. Prensky (2001b) goes on to mention that when a stimulus is repeated for “several hours a day, five days a week, and sharply focus[es] attention” (Prensky, 2001b, p. 02-8), it will more successfully ‘rewire’ the brain. One such example of this repetition in many children’s and young-adults’ lives is the repetition of video game play. Children’s minds are reworked to understand complex situations unique to an electronically-interactive environment. Furthermore, unlike books and standard learning practices, video games and the internet have users to leap around from subject to subject (Prensky, 2001b). This greatly alters the way in which today’s students learn.

James Paul Gee, Randy Hinrichs, J.C. Herz, Marc Prensky and Bewn Sawyer all discuss today’s learners at length in the article Game-Based Learning by Joel Foreman (2004). Gee states that “kids today are seeing more power-performance learning in their popular culture than they’re seeing in their schools” (Foreman, 2004). Hinrichs goes on to say that our education system is based on a very dated teaching system created to solve economical problems of
gathering information (Foreman, 2004). But the information accessibility climate is very
different than when our education system was developed. To adapt to the 21st century, education
systems must, according to Herz, organize its culture in a better manner (Foreman, 2004).
Hinrichs waxes on the difference between a child “sitting in a classroom early in the morning
because he had to be there at 8:30, trying to soak in the information, and a kid sitting in front of a
computer, responsible for the next action that’s going to happen, operating at twitch speed”
(Foreman, 2004, p. 54). Herz finally surmises that “what games allow you to do that lectures
don’t is to explore the solution space and ask, “What if I did this?” or “What happens in that
event?” You can do that in an online or a computer-based environment (Foreman, 2004, p. 54).
Herz states that lecturing to multiple students at once does not allow the instructor to push each
learner to the limit of his or her knowledge, while an online setting allows for the system to
individually challenge each learner to use the knowledge she or he possesses and apply it to the
task-at-hand.

In the following section of Game-Based Learning (Prensky, 2004), Gee, Prensky, Sawyer
and Herz suggest that digital game-based learning allows learners to actually experience a given
subject rather than just reading about the subject. The learner gets to actually live the subject and
ask questions about the rules within the simulation; the learner actually develops a vested interest
in the subject.

Marc Prensky suggests that digital game-based learning has changed from what it used to
be in that video games are not just used as tools for review, but “primary learning” tools for
“really hard subjects” (Prensky, 2001a, p. 9). Prensky surmises that digital game-based learning
will broaden many aspects of teaching difficult subjects and making the learners excited and
engaged about the subject material (Prensky, 2001a).
Aside from the subject matter, video games also develop other important skills such as abilities to read “visual images as representations of three-dimensional space,” “other thinking skills,” “rule discovery’ through observation, trial and error, and hypothesis testing,” “comprehension of scientific simulations” and “skills at ‘divided attention’ tasks” (Prensky, 2001b, p. 02-9). Mark Prensky (2005) argues that digital game-based learning is the solution to the current separation of what students expect and what they are receiving in school.

In his article Digital Game-Based Learning: It’s Not Just the Digital Natives Who Are Restless Richard Van Eck (2006) discusses digital game-based learning at length. Van Eck finds that proponents of digital game-based learning have gained an earnest educational audience about the effectiveness and necessity of a new form of delivery, but now a situation exists in need of an answer to the question of “How?” Related to the findings of Prensky and others, Van Eck finds that learning games are “effective not because of what they are, but because of what they embody and what learners are doing as they play a game” (Van Eck, 2006, p. 18). Van Eck also finds that learning through games is so effective because it is “applied and practiced within… context” (Van Eck, 2006, p. 18). Van Eck uses the simile that “lions do not learn to hunt through direct instruction but through modeling and play” (Van Eck, 2006, p. 18).

Lastly, as mentioned in chapter 1, Shaffer, Squire, Halverson and Gee (2005) find that the government and the military have already implemented the use of digital game-based learning while schools have not. Schools have not yet harnessed the power of digital game-based learning and the students are missing out.

Serious Games

According to Wikipedia.org (2008e) a serious game is “a software application developed with game technology and game design principles for a primary purpose other than pure
entertainment.” And in the context of this thesis, a serious game is one primarily targeted to teach or train.

In the article *U.S. Spies Use Custom Videogames to Learn How to Think*, Michael Peck (2008) discusses what the title implies. It is just one instance of the many uses of serious games as learning tools rather than a lecture or typical training session. The serious game allows the user to actually be put in a situation wherein the trainee has to think and apply knowledge related to the field of study.

Additionally, it seems that today’s students are aware of the potential in serious games and educational gaming. In the article *Students Want More Use of Gaming Technology*, Meris Stansbury (2008) cites that many of today’s students desire to be taught through relevant and up-to-date technology rather than the bland format used today.

In the opening section of Chen and Michael’s (2005) article *Proof of Learning: Assessment in Serious Games*, Chen and Michael offer many of the great examples of serious games in use:

In Houston, Texas, a new hire steps onto a simulated offshore drilling platform and rehearses safety protocols. In Washington, D.C., a firefighter surveys a digital raging forest fire and chooses locations for trenches and firebreaks. A soldier in Iraq prepares for an upcoming mission using a detailed simulation of the urban battlefield. And a high school student in Portland, Oregon, manages the political campaign of Abe Lincoln as he tries to beat out Rudy Giuliani in the presidential elections of 2008 (p. 1).

An interesting addition to the discussion on serious games, and digital game-based learning, Chen and Michael (2005) find that assessment of students using serious games as a
learning method might often be difficult to track and a teacher evaluation, rather than a test, may be necessary to gauge such learning. Furthermore, Chen and Michael (2005) state that for serious games to be accepted widely by educators, an effective assessment model must be created and used.

In Clark N. Quinn’s (2005) article *Soapbox: Making Learning Fun*, Quinn discusses, at length, his experience in serious gaming. Quinn (2005) developed a game for Australian kids who had to grow up without parents. Ultimately Quinn offers the reader a list of qualities a serious game should possess for it to teach successfully. See table 1 below for this list (Quinn, 2005).

<table>
<thead>
<tr>
<th>Table 1. Quinn’s Necessary Attributes of a Successful Serious Game</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contextualized</strong></td>
</tr>
<tr>
<td><strong>Clear goal</strong></td>
</tr>
<tr>
<td><strong>Appropriate challenge</strong></td>
</tr>
</tbody>
</table>
in the space just beyond the learner's capability where, with some effort and support, they can accomplish the task. Learners learn fastest when the challenge is significant but not impossible.

**Anchored**

The actions that the learner takes have to have a meaningful effect on the outcome. There can't be meaningless actions by the learner after which the story proceeds, but instead there have to be real consequences in the story line of the actions they take. Learners learn best when they're operating in ways they recognize are meaningful.

**Relevant**

In addition to the actions taken being meaningful to the story, the story and actions have to be meaningful to the learner. We need stories that appeal to their interests and motivations. Learners learn best when the setting is one they viscerally care about.

**Exploratory**

The environment has to have a wide variety of possible choices (or at least a perception of same), and the ability to try different things and explore the internal relationships. Learners learn best when they have to make choices and face the consequences of those choices.
Active manipulation

A related facet is having the learners active in exploring those relationships, and operating on the world in ways that are similar to the way you operate in the real world and that reflect the story setting. Learners learn best when there is minimal overhead between their intentions and the actions taken to achieve them.

Appropriate Challenge

The feedback from the world has to come in a way that makes sense in the world. They need to know they've acted, even if they don't immediately get to know the final outcomes of their action. Learners learn best when they get feedback about how they're doing.

Attention-getting

The action can't be totally deterministic, there needs to be some randomness and probability. Total determinism isn't desirable. Learners learn best when their attention and curiosity is maintained.

Civilization IV

Released in 2005, Civilization IV quickly became an entertainment mainstay. Civilization IV has sold over 3 million copies and has even had two follow-up expansions released since 2005. The game has been adapted for over thirteen languages and has received top-notch critical
acclaim. Civilization IV is rated E10+ by the Entertainment Software Rating Board (ESRB) which indicates that the game is suitable for everyone ages ten and older (Entertainment Software Rating Board, 2008). Listed in Table 2 below are several of the ratings and awards Civilization IV has received since its 2005 release according to Wikipedia.org (2008a):

Table 2. Civilization IV Critical Rating and Awards

<table>
<thead>
<tr>
<th>Game</th>
<th>Rating</th>
<th>Awards</th>
</tr>
</thead>
<tbody>
<tr>
<td>IGN</td>
<td>9.4/10</td>
<td>9.4/10 Editors’ Choice Award</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PC Game of the Year 2005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Best Strategy Game 2005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Best Online Game 2005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2nd-Best PC Game of All Time</td>
</tr>
<tr>
<td>GameSpot</td>
<td>9.4/10</td>
<td>9.4/10 Editors’ Choice Award</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nominee for 2005 Game of the Year</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Best Strategy Game of 2005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Best PC Game 2005</td>
</tr>
<tr>
<td>GameSpy</td>
<td>5/5</td>
<td>PC Game of the Year 2005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Best Turn-Based Strategy Game 2005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Game of the Year 2005</td>
</tr>
<tr>
<td>Eurogamer</td>
<td>9/10</td>
<td></td>
</tr>
<tr>
<td>Metacritic</td>
<td>94/100</td>
<td></td>
</tr>
<tr>
<td>The Times</td>
<td>5/5</td>
<td>5/5 stars</td>
</tr>
<tr>
<td>Game Informer</td>
<td>9.5/10</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td></td>
<td>Top Pick (E3, 2005)</td>
</tr>
</tbody>
</table>
The prior installment of the Civilization franchise, Civilization III, which carries many of the same game play mechanics, features, objectives, units, technologies, etc. as its follow-up title, was examined as a learning tool by Kurt D. Squire and Shree Durge (in press). In the article *Productive Gaming: The Case for Historiographic Play*, Squire and Durge argue that Civilization II can be used to aid in learning history. Squire and Durge suggest that through playing Civilization III, students could learn world history through “patterns and trends” for understanding world history. Besides teaching the facts, Civilization III also sets up a simulation wherein students can better understand relationships. These relationships can be more helpful than a terminology-based approach, especially when students struggle with names, dates, etc. (Squire K. D. & Durge S., in press).

Civilization III also showed Squire and Durge (in press) that students found themselves more interested in certain aspects of world history because the student could actually play a scenario representing a time and place in history. The example given in *Productive Gaming: The Case for Historiographic Play*, states that students could “[play] as Egypt, and [see] if they could fend off the Greeks, Persians, and Romans” (Squire K. D. & Durge S., in press, p. 5). Being part of these immersive scenarios, “social studies became a meaningful subject for students, as the game invited their participation into manipulating history as a system” (Squire K. D. & Durge S., in press, p. 5).

**Age of Empires II: The Age of Kings**

Similar to Civilization IV, Age of Empires II: The Age of Kings has had high critical acclaim and is viewed as one of the best real-time strategy (RTS) games. Again, like Civilization IV, Age of Empires II: The Age of Kings also had a successful expansion released. Age of
Empires II: The Age of Kings was originally released in 1999 and has a rating of T by the Entertainment Software Rating Board (2008) which indicates that the game may be suitable for ages 13 and older. Listed below are some of the critical ratings and awards from popular software reviewer resources.

Table 3. Age of Empires II: The Age of Kings Critical Rating and Awards

<table>
<thead>
<tr>
<th>Platform</th>
<th>Rating</th>
<th>Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>IGN</td>
<td>8.8/10</td>
<td>Editors’ Choice Award</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ranked 53rd in Top 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10th-Best PC Game</td>
</tr>
<tr>
<td>GameSpot</td>
<td>9.1/10</td>
<td>Editors’ Choice Award</td>
</tr>
<tr>
<td>Eurogamer</td>
<td>9/10</td>
<td></td>
</tr>
<tr>
<td>Metacritic</td>
<td>92/100</td>
<td></td>
</tr>
</tbody>
</table>

Age of Empires II: The Age of Kings offers many of the same benefits to learners as Civilization IV, and Civilization III, such as the immersive environments in which players take control of civilizations in real-world simulations. However, Age of Empires II: The Age of Kings lacks the depth of non-militaristic components and the open back-end qualities of Civilization IV.

Rise of Nations

Rise of Nations is, like Age of Empires II: The Age of Kings, a real-time strategy game that has received a high amount of critical acclaim. Rise of Nations was developed by Big Huge Games and released in 2003. Furthermore, Rise of Nations is rated T by the Entertainment Software Rating Board (2008) which indicates that the game may be suitable for ages 13 and older, just as Age of Empires: The Age of Kings. Below is a list of some of the critic ratings and awards Rise of Nations has earned.
Table 4. Rise of Nations Critical Rating and Awards

<table>
<thead>
<tr>
<th></th>
<th>Rating</th>
<th>Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>IGN</td>
<td>8.2/10</td>
<td></td>
</tr>
<tr>
<td>GameSpot</td>
<td>9.3/10</td>
<td>Editors’ Choice Award</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Best Strategy Game of 2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Best PC Game of 2003</td>
</tr>
<tr>
<td>Eurogamer</td>
<td>9/10</td>
<td>Top Ten RTS Games</td>
</tr>
<tr>
<td>GameSpy</td>
<td></td>
<td>2003 PC RTS Game of the Year</td>
</tr>
<tr>
<td>PC Gamer</td>
<td>95%</td>
<td>(Editor’s Choice)</td>
</tr>
<tr>
<td>Maximum PC</td>
<td>10/10</td>
<td></td>
</tr>
</tbody>
</table>

After researching Rise of Nations and Age of Empires II: The Age of Kings, the researcher has found many likenesses between the two games. Both are well-made real-time strategy games centered mostly around combat and military development. Resource management is an issue in both games, but mainly to the end of developing the largest army. The advantage found in Rise of Nations over Age of Empires II: The Age of Kings is the longer timeline and broader selection of civilizations.

Ohio Graduation Test

The first Ohio Graduation Test was administered in 2004 when it replaced the Ohio Ninth Grade Proficiency Test as the Ohio high school exit exam. The Ohio Graduation Test consists of social studies, math, science, reading and writing sections (Wikipedia.org, 2008d). Detailed below are several released questions, the respective correct and incorrect responses and information related to each response from the social studies section of the 2007 Ohio Graduation
Test. The information in this list is taken directly from the Ohio Department of Education (2007a).

- Citizenship Rights and Responsibilities
  
  o Multiple Choice Question: One way absolute monarchies are similar to dictatorships is that citizens under both systems of government typically
    
    ▪ Correct Answer (D): must engage in revolution in order to achieve governmental change.
      
      • Because citizens in absolute monarchies or dictatorships have no legal methods of bringing about governmental change, they must revolt in order to bring about change.
    
    ▪ Incorrect Answer (A): can elect new leadership by voting in elections.
      
      • If a student chooses A, he or she may not understand that citizens may not participate in elections in absolute monarchies or dictatorships.
    
    ▪ Incorrect Answer (B): have greater freedoms than citizens in democracies.
      
      • If a student chooses B, he or she may not understand that citizens in absolute monarchies or dictatorships enjoy few freedoms.
    
    ▪ Incorrect Answer (C): can amend their constitutions by gathering signatures on petitions.
      
      • If a student chooses C, he or she may not understand that citizens in absolute monarchies or dictatorships may not amend constitutions.
  
- Economics
Multiple Choice Question: Which statement correctly describes the role of the government in a country with a mixed economy?

- **Correct Answer (C):** The government makes some production and distribution decisions, but other economic decisions are made by individuals.
  - Governments have limited influence over economies in mixed economies. In a mixed economy, the government makes some production and distribution decisions, but other economic decisions are made by individuals.

- **Incorrect Answer (A):** The government allows economic decisions to be made by the society’s traditions and customs.
  - If a student chooses A, he or she does not understand that the government allows economic decisions to be made by the society’s traditions and customs in traditional economies.

- **Incorrect Answer (B):** The government makes all decisions regarding the production and distribution of goods.
  - If a student chooses B, he or she does not understand that the government makes all decisions regarding the production and distribution of goods in command economies.

- **Incorrect Answer (D):** The government exercises no decision making in economic matters; production and distribution are determined solely by individuals.
• If a student chooses D, he or she does not understand that the government exercises no decision making in economic matters in market economies.

• Geography

  o Multiple Choice Question: The North American Free Trade Agreement (NAFTA) is a treaty designed to remove tariffs and other trade barriers between Canada, Mexico and the United States. This helped establish an economic region among those nations because

    ▪ Correct Answer (D): trade among participants increased, making their economies more interdependent.

    ▪ By removing tariffs and other trade barriers among members of NAFTA, trade among participants increased, making their economies more interdependent. As a result, an economic region was created.

    ▪ Incorrect Answer (A): participants enlarged their dependence on domestic markets.

    ▪ If a student chooses A, he or she may not understand that NAFTA allowed its members to reduce their dependence on domestic markets.

    ▪ Incorrect Answer (B): participants terminated trade relationships with other regions.
• If a student chooses B, he or she may not understand that NAFTA did not require its members to terminate trade relationships with other regions.

  ▪ Incorrect Answer (C): participants imposed tariffs on goods imported from other countries.

  • If a student chooses C, he or she may not understand that NAFTA did not impose tariffs on goods imported from other countries.

• Government

  ▪ Multiple Choice Question: The primary feature of a dictatorship is that

    ▪ Correct Answer (D): leaders make decisions without the consent of the people.

      • In a dictatorship, the dictator has absolute power and is not held accountable by the citizenry.

    ▪ Incorrect Answer (A): people are permitted to vote for more than one candidate.

      • If a student chooses A, he or she may not understand that people are not permitted to vote in a dictatorship.

    ▪ Incorrect Answer (B): the executive branch has equal power with the legislative branch.

      • If a student chooses B, he or she may not understand that there is no division of power in a dictatorship.

    ▪ Incorrect Answer (C): judicial courts are replaced by military courts.
• If a student chooses C, he or she may not understand that the presence of military courts does not define a dictatorship.

• History
  
  o Multiple Choice Question: In 1943, 15 percent of the shipyard workers in San Francisco were Chinese-Americans. Before this, they had been largely confined to working in restaurants and laundries. The switch in occupations was due, in large part, to the
    
    ▪ Correct Answer (D): massive need for workers to build ships during World War II.
    
    ▪ United States involvement in World War II required the construction of new ships. Because of the massive need for workers to build ships, Chinese-Americans left traditional work roles to meet that need.
    
    ▪ Incorrect Answer (A): shipbuilding skills of Chinese-Americans.
      
      ▪ If a student chooses A, he or she may not understand that Chinese-Americans were known for their labor in railroad construction in the 19th century, not shipbuilding in the 20th century.
      
      ▪ Incorrect Answer (B): increased availability of higher education for immigrants.
        
        ▪ If a student chooses B, he or she may not understand that shipyard labor did not require higher education.
        
        ▪ Incorrect Answer (C): increased labor union restrictions against Chinese-American workers.
• If a student chooses C, he or she may not understand that labor union restrictions against Chinese-American workers would have reduced the number of Chinese-American labor in shipyards.

○ Essay Question: There was a connection between industrial expansion and European imperialism in the late 19th and early 20th centuries. Did imperialism increase or decrease as a result of industrialization? Explain why this change occurred.

  ▪ Explanation of the Correct Answer: In order for industrial nations (countries with factories and manufacturing) to produce goods cheaply, they needed cheap supplies of labor and raw materials. Having constant access to both, as well as markets in which to sell goods produced, made the practice of imperialism (more developed countries taking over less developed countries) highly profitable, and encouraged many nations to enter into “land grabs” in Asia and Africa.

   Additionally, the Ohio Department of Education (2007a) offers two sections entitled “What knowledge do students need to understand this concept?” and “How does this question measure Ohio’s academic content standards?” for each available released question. Below are directly-quoted examples of these two entries (Ohio Department of Education, 2007a).

• Citizenship Rights and Responsibilities Question 21

  ○ What knowledge do students need to understand this concept?

    ▪ Students need to know about opportunities for citizens’ participation under different systems of government including absolute monarchies, constitutional monarchies, parliamentary democracies, presidential
democracies, dictatorships, and theocracies. Ask students how citizens can participate in the government in the United States (through electing a president every four years). Have students research on the Internet how citizens can or cannot participate in each type of government. Then, discuss the ways citizens participate under each type of government.

- How does this question measure Ohio’s academic content standards?
  - Benchmark A: Analyze ways people achieve governmental change, including political action, social protest and revolution.

- Economics Question 26

  - What knowledge do students need to understand this concept?
    - Students need to know how to compare different economic systems such as traditional, market, command, and mixed economies.

  - How does this question measure Ohio’s academic content standards?
    - Benchmark A: Compare how different economic systems answer the fundamental economic questions of what goods and services to produce, how to produce them, and who will consume them.

- Geography Question 37

  - What knowledge do students need to understand this concept?
    - Students need to know how political and economic conditions, resources, geographic locations, and cultures have contributed to cooperation and conflict. Discuss and review how NAFTA has contributed to cooperation among member nations with students. Have them research on the Internet
other economic arrangements, such as the European Union, to explain why these agreements lead to greater cooperation among nations.

- How does this question measure Ohio’s academic content standards?
  - Benchmark A: Analyze the cultural, physical, economic and political characteristics that define regions and describe reasons that regions change over time.

- Government Question 33
  - What knowledge do students need to understand this concept?
    - Students need to know how to analyze the purposes, structures and functions of various systems of government, including absolute monarchies, constitutional monarchies, parliamentary democracies, presidential democracies, dictatorships, and theocracies.
  - How does this question measure Ohio’s academic content standards?
    - Benchmark B: Analyze the differences among various forms of government to determine how power is acquired and used.

- History Question 31
  - What knowledge do students need to understand this concept?
    - Students need to know the impact of U.S. participation in World War II with an emphasis on the home front. Have students make a list of ways in which the home front supported the war effort. Help them research the contributions of different racial and ethnic groups to the U.S. war effort in World War II. Have students ask a relative or friend who was alive during
World War II to tell them about the ways they contributed to the war effort.

- How does this question measure Ohio’s academic content standards?
  - Benchmark F: Identify major historical patterns in the domestic affairs of the United States during the 20th century and explain their significance.

Curriculum Development and Instructional Design

According to Wikipedia.org instructional design “is the practice of arranging media (communication technology) and content to help learners and teachers transfer knowledge most effectively. The process consists broadly of determining the current state of learner understanding, defining the end goal of instruction, and creating some media-based "intervention" to assist in the transition” (2008c).

Robert Gagne is revered as one of the greatest contributors to instructional design theory and practice. In his book Conditions of learning, 1965, Gagne describes his Nine Events of Instruction. These Nine Events of Instruction are highly regarded and referred to by professionals in the field of instructional design. Detailed in table 5 is Gagne’s Nine Events of Instruction (Kruse, 2006).

Table 5. Gagne’s Nine Events of Instruction

1. Gain Attention  
   Stimuli activates receptors
2. Inform learners of objectives  
   Creates level of expectation for learning
3. Stimulate recall of prior learning  
   Retrieval and activation of short-term memory
4. Present the content  
   Selective perception of content
5. Provide "learning guidance"  
   Semantic encoding for storage long-
term memory

6. Elicit performance (practice)  Responds to questions to enhance encoding and verification

7. Provide feedback  Reinforcement and assessment of correct performance

8. Assess performance  Retrieval and reinforcement of content as final evaluation

9. Enhance retention and transfer to the job  Retrieval and generalization of learned skill to new situation

Additionally, Kevin Kruse (2006) provides the reader with a description for each step in Gagne’s *Nine Events of Instruction*.

1. “Gain Attention: In order for any learning to take place, you must first capture the attention of the student. A multimedia program that begins with an animated title screen sequence accompanied by sound effects or music startles the senses with auditory or visual stimuli. An even better way to capture students' attention is to start each lesson with a thought-provoking question or interesting fact. Curiosity motivates students to learn.”

2. “Inform learners of objectives: Early in each lesson students should encounter a list of learning objectives. This initiates the internal process of expectancy and helps motivate the learner to complete the lesson. These objectives should form the basis for assessment and possible certification as well. Typically, learning objectives are presented in the form of "Upon completing this lesson you will be able to. . . ."
3. “Stimulate recall of prior learning: Associating new information with prior knowledge can facilitate the learning process. It is easier for learners to encode and store information in long-term memory when there are links to personal experience and knowledge. A simple way to stimulate recall is to ask questions about previous experiences, an understanding of previous concepts, or a body of content.”

4. “Present the content: This event of instruction is where the new content is actually presented to the learner. Content should be chunked and organized meaningfully, and typically is explained and then demonstrated. To appeal to different learning modalities, a variety of media should be used if possible, including text, graphics, audio narration, and video.”

5. “Provide ‘learning guidance’: To help learners encode information for long-term storage, additional guidance should be provided along with the presentation of new content. Guidance strategies include the use of examples, non-examples, case studies, graphical representations, mnemonics, and analogies.”

6. “Elicit performance (practice): In this event of instruction, the learner is required to practice the new skill or behavior. Eliciting performance provides an opportunity for learners to confirm their correct understanding, and the repetition further increases the likelihood of retention.”

7. “Provide feedback: As learners practice new behavior it is important to provide specific and immediate feedback of their performance. Unlike questions in a post-test, exercises within tutorials should be used for comprehension and encoding purposes, not for formal scoring. Additional guidance and answers provided at this stage are called formative feedback.”
8. “Assess performance: Upon completing instructional models, students should be given the opportunity to take (or be required to take) a post-test or final assessment. This assessment should be completed without the ability to receive additional coaching, feedback, or hints. Mastery of material, or certification, is typically granted after achieving a certain score or percent correct. A commonly accepted level of mastery is 80% to 90% correct.”

9. “Enhance retention and transfer to the job: Determining whether or not the skills learned from a training program are ever applied back on the job often remains a mystery to training managers - and a source of consternation for senior executives. Effective training programs have a "performance" focus, incorporating design and media that facilitate retention and transfer to the job. The repetition of learned concepts is a tried and true means of aiding retention, although often disliked by students. (There was a reason for writing spelling words ten times as grade school student.) Creating electronic or online job-aids, references, templates, and wizards are other ways of aiding performance.”

Summary

Through the research done for the section it becomes apparent that there is a need for a shift in teaching delivery strategies of teachers. More specifically, Ohio Graduation Test-takers need assistance to improve their proficiency. Digital game-based learning has proven its potential as a good means of delivery and Civilization IV is a quality game with the correct correlations to social studies content standards in Ohio high schools. The researcher has used Quinn’s (2005) and Gagne’s (Kruse, 2006) thoughts of standards of delivery to ensure that the proposed curriculum is both pedagogically-sound and a sound digital game-based learning tool.
CHAPTER III. METHODOLOGY

Introduction

The social studies section of the Ohio Graduation Test has had mixed results from Ohio high school students. In fact, as many as twenty-four percent of high school students were considered ‘below proficient’ on the social studies section of the Ohio Graduation Test between the years of 2005 and 2007 (Ohio Department of Education, 2007b). Moreover, students are not being engaged as much inside of the classroom as they are outside (Prensky, 2005). This, in combination with an out-of-date delivery method of education (Foreman, 2004), leads to a stalemate wherein high school students will not improve overall proficiency on the Ohio Graduation Test.

Purpose

The purpose of this study was to match the intended learning outcomes of the Ohio Graduation Test social studies content standards to features of off-the-shelf gaming to develop a pedagogically-sound curriculum model integrating gaming based on previous research in the field of digital game-based learning. The proposed model was designed with the intent of being supplemented into an existing Ohio high school social studies curriculum.

Research Design

For this study, the researcher has utilized a research design method of educational research. Wikipedia.org defines educational research as “research conducted to investigate behavioral patterns in pupils, students, teachers and other participants in schools and other educational institutions. Such research is often conducted by examining work products such as documents and standardized test results” (2008b). Through information available from the Ohio Department of Education website (2007b), the researcher has been able to discern social studies as one of the areas of the Ohio Graduation Test with the lowest proficiency by Ohio high school
students. Additionally, the researcher was able to analyze the patterns in content standards expectancies and intended learning outcomes set in place by the Ohio Department of Education (2002 and 2005) with the purpose of evaluating associations with aspects of the three games, Civilization IV, Age of Empires II: The Age of Kings and Rise of Nations.

Additionally, the International Society for Technology in Education (2007) has developed the Educational Technology Standards for Students which worked as a framework to gauge the success of using an off-the-shelf game as a learning aid in a social studies classroom. Listed below are the components of the Educational Technology Standards for Students.

1. **Creativity and Innovation**: Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. Students:
   a. apply existing knowledge to generate new ideas, products, or processes.
   b. create original works as a means of personal or group expression.
   c. use models and simulations to explore complex systems and issues.
   d. identify trends and forecast possibilities.

2. **Communication and Collaboration**: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. Students:
   a. interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media.
   b. communicate information and ideas effectively to multiple audiences using a variety of media and formats.
   c. develop cultural understanding and global awareness by engaging with learners of other cultures.
d. contribute to project teams to produce original works or solve problems.

3. **Research and Information Fluency**: Students apply digital tools to gather, evaluate, and use information. Students:
   
   a. plan strategies to guide inquiry.
   b. locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
   c. evaluate and select information sources and digital tools based on the appropriateness to specific tasks.
   
   d. process data and report results.

4. **Critical Thinking, Problem Solving, and Decision Making**: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. Students:
   
   a. identify and define authentic problems and significant questions for investigation.
   b. plan and manage activities to develop a solution or complete a project.
   c. collect and analyze data to identify solutions and/or make informed decisions.
   
   d. use multiple processes and diverse perspectives to explore alternative solutions.

5. **Digital Citizenship**: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. Students:
   
   a. advocate and practice safe, legal, and responsible use of information and technology.
   b. exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.
   
   c. demonstrate personal responsibility for lifelong learning.
d. exhibit leadership for digital citizenship.

6. **Technology Operations and Concepts**: Students demonstrate a sound understanding of technology concepts, systems, and operations. Students:
   
a. understand and use technology systems.
   
b. select and use applications effectively and productively.
   
c. troubleshoot systems and applications.
   
d. transfer current knowledge to learning of new technologies.

**Information Gathering**

Information gathering consisted of a two-step process to further understand the areas of knowledge needed to complete this thesis. First, the researcher analyzed the standards already in place for the Ohio Graduation Test. With this information the researcher was able to compare that data with step two of information gathering; software exploration. Further exploring the software allowed the researcher to successfully identify sections of the academic content standards (Ohio Department of Education, 2002 and 2005) that were correlated to aspects of the separate games and which game best fulfills the role of a learning aid in social studies classrooms.

**Expert Panel**

An expert panel was formed with the purpose of analyzing the researcher’s proposed digital game-based learning curriculum implementing off-the-shelf software with the goal of improvement in proficiency on the social studies section of the Ohio Graduation Test. The expert panel consisted of a subject matter expert, curriculum specialist and gaming expert. The subject matter expert is a licensed technology education teacher in Ohio and has taught at the middle school, high school and higher education settings. Additionally, the subject matter expert has
worked with middle school students on Ohio Achievement Testing preparation. The subject matter expert’s experience in teaching a high school class and in preparing students for standardized tests greatly increased the level of insight provided. This individual ensured that the designed curriculum satisfies the curriculum requirements of a high school teacher.

Furthermore, the curriculum expert has extensive curriculum-related experience in the roles of secondary teacher, curriculum coordinator, elementary principal and assistant superintendent (curriculum educational services). The curriculum expert currently serves as a consultant for High Schools That Work (HSTW) and Making Middle Grades Work (MMGW), school improvement frameworks, of which over 200 Ohio schools participate. This individual is also a PRAXIS III assessor for teacher licensure. The curriculum expert conducts statewide data workshops and is currently serving as Interim Executive Director of the Ohio Association for Supervision and Curriculum Development (Ohio ASCD). This individual is also a past Leadership Council Member of ASCD, International and Adjunct Instructor for the Department of Educational Leadership at Wright State University. Furthermore, the curriculum expert has a Bachelor of Science in Education from Ohio University and a Master of Education from Wright State University. The curriculum expert ensured that the curriculum designed is pedagogically-sound with expert experience related to curriculum design in Ohio.

Lastly, the gaming expert was able to advise the researcher on any improvements related to the gaming aspect of the designed curriculum and offer insight to the researcher related to using games as learning aids. The gaming expert has extensive experience in gaming from a Master of Education in Career and Technology Education with a primary focus on creating an instructional design model for digital learning games. This individual has worked with companies such as Electronic Arts and Blizzard Entertainment as a private beta tester and has
had experience creating and modifying user interface controls and layout mods for several
games. The gaming expert also currently teaches at the collegiate level.

Timeline

Table 6 below details the timeline of events followed for this study.

Table 6. Timeline for Curriculum Development

<table>
<thead>
<tr>
<th>May-June</th>
<th>Complete Social Studies Curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 1</td>
<td>Confirm Members of Expert Panel</td>
</tr>
<tr>
<td>June</td>
<td>Develop Material for Expert Panel</td>
</tr>
<tr>
<td>June 30</td>
<td>Deliver Material to Expert Panel for Review</td>
</tr>
<tr>
<td>July</td>
<td>Further Develop Social Studies Curriculum</td>
</tr>
<tr>
<td>August</td>
<td>Finish Chapters 4 and 5</td>
</tr>
</tbody>
</table>
CHAPTER IV. FINDINGS

Educational Objectives

To be successful as a learning tool for Ohio high school students and to aid these learners in their educational pursuits, the used game must meet requirements already set in place and accepted as viable learning objectives for Ohio high school students. It is with this consideration that the researcher compiled content standards from *A Guide to the New Ohio Graduation Tests for Students and Families* (Ohio Department of Education, 2005) and from the *Social Studies Academic Content Standards* (Ohio Department of Education, 2002) used by the Ohio Department of Education to design a content standard objectives checklist for the use of an off-the-shelf game as an Ohio Graduation Test learning tool for Ohio high school students.

The *Social Studies Academic Content Standards* offers a list of benchmarks and indicators that students should be able to grasp arranged in order from grades K-12. The researcher focused on the benchmarks and indicators for grades 10-12, since Ohio students have from 9th grade to 12th grade to pass the Ohio Graduation Test. However, some attention was given to grades K-9 since these benchmarks and indicators are relevant hierarchal steps to the ones indicated for grades 10-12.

*History*

- Content Standard: Explain cause and effect relationships among historical developments, including industrialization and imperialism (Ohio Department of Education, 2005).
  - Civilization IV: Many technologies and civics are available in Civilization IV that accurately represent various important concepts in history. Industrialism is one such available technology in Civilization IV. Not only do the in-game mechanics of this technology emulate the historical
developments of industrialization, the game also provides a brief
description of industrialization in an historical context.

- Rise of Nations: Rise of Nations does not boast the amount of advances
  (technologies) as Civilization IV, nor does Rise of Nations have an
  Industrialization or Imperialism technology. However, Rise of Nations
does have a large amount of advancements that represent actual effects of
real-world advances such as trade, literacy and scientific method.

- Age of Empires II: The Age of Kings: Age of Empires II: The Age of
  Kings does not provide advancements to the user as Civilization IV and
  Rise of Nations do, other than combat and warring upgrades. Furthermore,
because of the short time span that Age of Empires II: The Age of Kings
represents, it is hard for the game to contain a large variation in human
advancements.

- Researcher Assessment: It was with this research that the researcher was
  able to assess that Civilization IV meets this content standard the best
  because of its amount and variation of technologies that represent real-
  world advances in human history. Furthermore, Civilization IV was the
  game that stood out as giving a more evenly split focus to other aspects of
  human history rather than just combat. Following is the in-game text about
  industrialization and a screenshot pertaining to the industrialism
technology both provided in Civilization IV:

  Industrialization involves the use of machines to dramatically increase
  productivity. Production of goods became concentrated in factories, where the
combination of specialization of labor and automation reduced labor costs and, ultimately, the cost of the final manufactured product to the consumers.

Industrialization revolutionized living standards, both positively and negatively. The rapid growth of production industries and the reduced cost of production have led to the prosperity of some of the richest families in history. Industrialization has also led to the creation of a blue-collar working class. In newly industrialized nations, these workers, skilled only in their chosen trade, are often underpaid and forced to endure abominable working conditions.

Figure 1. Industrialism Technology
Content Standard: Show connections among historical developments occurring in different decades and centuries, such as World War I, World War II and the Cold War (Ohio Department of Education, 2005).

- Civilization IV: Scenarios are available in Civilization (such as a campaign in World War II and a scenario representing the American Revolution) that allow the player to play as one of the nations represented in the battle, war or time in history. Furthermore, the WorldBuilder feature is available in Civilization IV. The WorldBuilder feature allows a user to create and define a unique scenario. Civilization IV is greatly customizable due to the WorldBuilder feature and its open back-end. Additionally, Civilization IV allows the user to advance through ages that do represent historical developments occurring in different decades and centuries.

- Rise of Nations: Similar to Civilization IV, Rise of Nations provides the user with various scenarios that represent historical situations and an open back-end in which users and developers can create customized games. However, Rise of Nations lacks the amount of in-game effects Civilization IV that represent historical events, advancements and technologies.

- Age of Empires II: The Age of Kings: Age of Empires: The Age of Kings does not allow the user to experience simulated historical events in as broad of a range of time as Rise of Nations and Civilization IV.

- Researcher Assessment: Due to its available time span and amount of in-game effects that represent historical events, it was assessed that
Civilization IV best matches the content standard. Following is the description provided in-game about the American Revolution scenario and a screenshot of the scenario selection screen in Civilization IV:

In 1775 the 13 British Colonies in North America broke out in open revolution against the empire and sought to forge their own path alone as an independent nation. Citing exploitive practices by the British Empire, the Colonists were angered over what they saw as unjust taxation, lack of representation in the British government, and in the case of some, loss of potential fortunes which could be made trading with other parts of the world.

Figure 2. Scenario Selection Screen
People in Societies

- Content Standard: Describe interrelationships that exist between cultural groups from exchanges of cultural practices to instances of discrimination and conflict (Ohio Department of Education, 2005).

  - Civilization IV: Civilization IV has various aspects that relate to culture. Culture is a key concept in Civilization IV that represents a civilization’s successes in the arts and literature. Varying cultures are accurately represented in Civilization IV by the various religions, arts and world wonders that can be generated. Furthermore, eighteen playable empires, such as American, Aztec, Egyptian, French, Greek, Indian, Malinese, Persian and Russian, are available in Civilization IV, each representing a unique culture in the world. Interactions among the various civilizations represents actual relations among world cultures in that some are peaceful and some are violent, some proffer trade while others stifle trade and yet other relations accept each others’ religions and cultures while others do not. In Civilization IV, relations can be spoiled or strengthened by various civilizations’ aspects such as government, religion, aggression and alliances. Below the Age of Empires II: The Age of Kings and Rise of Nations review is one such example of spoiled relations between two civilizations in the American Revolution scenario. The text box in the bottom left corner of the screenshot shows that because a war was declared, tensions have greatly increased between the Colonials and the British.

  - Rise of Nations: Rise of Nations does allow the user some depth in culture-related aspects like Civilization IV, however with less depth. Rise of Nations actually
boasts many of the same aspects as Civilization IV, but does not represent as many as Civilization IV does.

- Age of Empires II: The Age of Kings: Age of Empires II: The Age of Kings, as mentioned above, does not give the user the amount control over aspects other than battle and war to satisfy this content standard.
- Researcher Assessment: Civilization IV has an extensive amount of control over cultural-related aspects of history in-game and was the best game to match this content standard.

Figure 3. Relations Spoil
**Geography**

- Content Standard: Use maps and geographic data to analyze changes brought about by human activity (Ohio Department of Education, 2005).
  - Civilization IV: Pollution, deforestation, irrigation and many other actions in Civilization IV greatly alter the terrain on which players and computer players interact. Furthermore, map reading is a skill that a player must utilize on a constant basis to be successful in Civilization IV.
  - Rise of Nations: Again, Rise of Nations hosts some of the same or similar features as Civilization IV, but not nearly as many.
  - Age of Empires II: The Age of Kings: Furthermore, Age of Empires II: The Age of Kings does not allow the user as much interaction with maps and geography as Civilization IV and Rise of Nations.
  - Researcher Assessment: Civilization IV again proved to be the game best suited to meet the content standard due to its depth and amount of in-game features. Below is a screenshot from Civilization IV that shows a playable map of South America; the Andes Mountains are visible on the left-hand side of the screenshot.
Figure 4. Andes Mountains

- Content Standard: Analyze the characteristics used to define geographic regions (Ohio Department of Education, 2005).
  - Civilization IV: Various playable map presets are available ranging from archipelagos to continents and from islands to lakes. Each map preset offers the player various benefits and challenges to overcome during a game. Additionally, temperate, arid, cold, rocky and tropical climates affect the game differently by offering different geographic characteristics (such as grassland, plains, desert, tundra, ice, coast, ocean, mountain, hill and jungle) that alter game play by
providing various resources and challenges (rough passes, combat bonuses, production bonuses and food bonuses).

- Rise of Nations and Age of Empires II: The Age of Kings: Both of these games feature almost identical geographic features, but do not contain the amount of depth that Civilization IV’s geographic features possess.

- Researcher Assessment: Civilization IV hosts the greatest depth of the three games related to geographic features. Below are screenshots of jungle bonuses and of the various resources that are available in Civilization IV.

Figure 5. Jungle
Figure 6. Resources

Economics

- Content Standard: Compare how different economic systems determine what goods and services to produce, how to produce them and who will consume them (Ohio Department of Education, 2005).
  - Civilization IV: Various economic civics which the player can employ provide differing benefits and ramifications. Key economic concepts are represented in Civilization IV that have realistic implications in-game. For instance, the state property economic civic represents a type of government in which there are no private properties, only state-owned properties. Because everything in a
c civilization that employs this civic is state-owned and more efficient, upkeep costs are reduced and certain building become more efficient in output.

- Rise of Nations: More so than Age of Empires II: The Age of Kings, but less than Civilization IV, Rise of Nations contains several economic and production aspects.

- Age of Empires II: The Age of Kings: As stated above, Age of Empires II: The Age of Kings does has very few features related to this content standard.

- Researcher Assessment: Civilization IV best relates to this content standard.

Below is a screenshot of the information screen related to state property from Civilization IV.
Figure 7. State Property Economic Civic

**Government**

- Analyze how various systems of government, ranging from democracies to theocracies, acquire and use political power (Ohio Department of Education, 2005).
  - Civilization IV: Various government civics are available for the player to use in Civilization IV: Each of which has its own positives and negatives related to game play that accurately represent actual government systems. The representation government civic in Civilization IV makes more citizens happy because they have a chance to vote and have their voices represented by elected
officials while the police state government civic makes for paranoid civilians but increases military unit output.

- Rise of Nations and Age of Empires II: The Age of Kings: Both of these games have very little in the way of governmental control when compared to Civilization IV.
- Researcher Assessment: Once again, Civilization IV seemed to possess the most features to meet this content standard. Below are screenshots for the representation and police state information pages from Civilization IV.

---

**Figure 8. Representation Government Civic**
Results

The researcher proposed a series of questions to the expert panel after each member of the expert panel had a chance to review a selection of parts of this study. Below are the questions proposed to, and responses from, each panel member.

- Does the proposed curriculum satisfy the objective? Why? And if so, how?
  - Gaming Expert: “Yes. The objective of the study is to improve student learning in a social studies curriculum by implementing the use of digital game-based learning, in this case using Civilization IV. Using student scores as statistics prior to the engagement and deployment of Civilization IV can be directly compared to..."
the end result student score once the students have completed their trials and competitions with the game. The researcher will be able to compare the scores to discover a direct relationship between the overall results both before and after deployment of the proposed curriculum.”

- Curriculum Expert: “Yes. The curriculum of digital game-based learning (DGBL) addresses the problems of student engagement and low performance on the social studies portion on the Ohio Graduation Test. Low levels of student engagement are frequently cited in current studies of U.S. high schools. It's difficult to raise the rigor of the curriculum without a commensurate increase in student engagement. In a media-influenced world of tease, flash, sound bites and truncation, students turn a deaf ear to more traditional means of teaching and learning.”

- Subject Matter Expert: “Yes, the objective is to use game-based learning to improve students’ learning. The game is being added in addition to normal classroom activities which will further the students learning and aid in retention of the materials.”

- Are there any foreseeable problems that might arise from the proposed curriculum?

- Gaming Expert: “Problematic instances may arise from implementing the proposed curriculum. First is the students’ initial interest in video games. While video games are very popular among teenagers, not every teenager has played a game before due to lack of interest, or a lack of financial resources. It would be difficult to assume the rewards of excelling in the course and receiving in-game resources would be equally motivating for every student. Every gamer has their
own personal interests in video games when it comes to the genre they desire. Civilization IV is a turn-based strategy game. There may be hardcore gamers who specifically do not like this genre of game, therefore dismissing some of the engagement and retention that is sought after. Also students who play games may only play on home consoles such as the Nintendo Wii, Microsoft’s XBOX 360 or the Sony Playstation 3 and do not typically game on PCs or Macs. Also, some students may have prior experience with this type of genre, gaming in general, or specifically this title. Would that play an unfair advantage to some students? Psychologically, the experience could affect some students. Civilization IV is a competitive game. Students may not want to participate solely because they do not want to experience losing to another classmate in front of his or her peers. Would losing create bad attitudes from some players or affect their relationships with other students? Another instance comes from the technical aspect of incorporating the game into the curriculum. A school would have to have sufficient resources to have computers that meet at least the minimum system requirements to run the game. The school would also have to have a network or internet connection capable of handling multiple students when they are facing each other in the game. If schools need to upgrade, this can become costly. Faculty members who may be unfamiliar of the gaming industry would also have to be responsible for installing patches, updates, and troubleshooting any instances that may arise when students are gaming on a computer. Being treated to the experience of playing games could affect educational impact and absorption. It would be interesting to see how these selected students perform in
their other courses after being exposed to the digital learning game. Without being offered the reward of playing Civilization IV, will some students lose interest in their studies in other courses?”

- Curriculum Expert: “Using game-based learning to engage students and to address weak areas of the curriculum is a sound approach. What are the specific areas of weakness and how do the games specifically address those weak areas? How will students' skills and needed background knowledge be strengthened and reinforced as a result of their participation? What is the “trade-off” between traditional instructional approaches (lecture, discussion, etc.) which are often considered “time efficient” but usually less engaging and the more time-consuming DGBL? How will this model provide the “flexibility” to use multiple strategies to help students to become more successful?”

- Subject Matter Expert: “While this could be integrated very easily into some schools problems that could arise in others. There could be classroom management issues and issues with availability of resources. If there are not enough computers for each student to play, the students not using the computers would have to be completing other assignments related to the class to avoid downtime and disruptions. Availability of resources could especially be an issue in schools that only have one computer lab or only a few computers in each classroom.”

• How might you change the curriculum to better suit the classroom needs?

- Gaming Expert: “You would most likely have to offer an alternative reward for those students who do not show interest in gaming. The alternative would have to
look and feel rewarding so that the students who are not participating feel as if they are getting the same treatment for the effort they put into the course. Some examples could be a study hall session to hang out with friends or work on other coursework, being able to watch television in class while the other students are gaming or a form of recognition highlighting their achievements. I mentioned the possible fear of competition earlier. An alternative to this (that may also evoke team-building skills), would to have two or more players play cooperatively against the computer’s Artificial Intelligence in an effort to be successful at the game. This could prompt new in-class relationships and critical thinking. It could also lead to students talking strategy and/or tactics about the different civilizations in the game outside of the classroom, leading the learning process to be ongoing.

- Curriculum Expert: “Identify specific areas of weakness (social studies skills and content knowledge) contributing to low performance on the OGT? Link identified areas of weakness to requisite skills and background knowledge that are needed for “winning” and/or that can be developed through DGML. Determine the optimal amount of time that can be devoted to DGML along with other instructional means for maximum student success. Utilize the back-end utility of the software for customizing to specific needs and to increase the likelihood of success.”

- Subject Matter Expert: “I would structure the curriculum so that it would be easily adaptable for any teacher to use at any school. This would mean also planning activities that are not lecture based that students could be working on when they are not able to have access to the computers if not enough are available for
everyone to do at the same time. These activities should not be homework, but something that they could do in groups possibly to further their understanding of the materials. The curriculum has to be made attractive for a teacher in any situation. A teacher who has 30 computers in there room would jump at being able to do this, while a teacher who has 15 computers in a single computer lab used by the entire school would be very hesitant to adopt the curriculum.”

• Comments and ideas for further development.
  o Gaming Expert: “Overall I really like the proposed curriculum but do feel that it may be too dependent on the assumption of every student liking video games. An alternative, dependent on the school’s situation and class size, would be to offer a section of the course enrolling only those students who show an interest for the model. It would be interesting to see a class’ test results from those who participate in the digital-learning game approach compared to a class of students who take the existing standard educational approach. It may be helpful to mention that the game supports English, German, French, Spanish, Italian, Japanese, Chinese, Russian, Finnish, Czech, Portuguese, Polish and Hungarian languages, accommodating students from multiple ethnic backgrounds.”
  o Curriculum Expert: “How will you determine the effectiveness of DGBL? What measures of student performance may be used to determine effectiveness? What is the optimal amount of instructional time that can be devoted to DGBL without compromising other proven means of instruction? The answer to this question will address the current “dismissive” attitude of many teachers concerning video games and will facilitate replication of this curriculum model. How does DGBL
require students to apply their knowledge and skills, resulting in a deeper understanding of concepts, retention, and mastery? How might DGBL be utilized for performance-based assessment of students? How might such performance measures be used as predictors of OGT success? What customized scenarios added through the back-end utility of the software may be developed to specifically address weak OGT areas? How might students be involved in developing these scenarios in order to add interest and increase student engagement?”

- Subject Matter Expert: “I think that this is a great idea, and that it would be very beneficial in helping students retain what they are learning in the classroom. There are many benefits to digital game based learning and one of the major things holding schools back from using curriculum such as this is the lack of computers and technology in non affluent school districts, which are also often the schools which perform lower on the OGT. It would be interesting to research what the correlation is between technology in schools and scores on the OGT.”

In summary, the proposed curriculum met the objectives of the study. However, potential problems have been identified by members of the expert panel. Furthermore, ideas for further research and development have been elicited by the expert panel.
CHAPTER V. CONCLUSIONS, SUMMARY, RECOMMENDATIONS

The researcher consulted with a panel of experts in the areas of teaching, gaming and curriculum design. With the information provided by the expert panel, the researcher was able to develop several conclusions and recommendations.

Conclusions

Listed in this section are conclusions based on the researcher’s findings and the outcomes of the expert panel’s feedback.

• The proposed curriculum satisfies the learning objective of aiding Ohio high school students on the social studies section of the Ohio Graduation Test.

• The curriculum could face financial limitations due to the need for computers, software, information technology support, internet access, etc.

• Ohio Graduation Test results may be lower in school districts which have greater financial limitations and therefore could not afford the potentially expensive digital game-based curriculum.

• Students who are in classes utilizing digital game-based learning may become less engaged in other classes due to the gap in engaging learning material.

• Not all students bear the same interest in technology and video games. Civilization IV, and other video games, may only appeal to a segment of the student population.

• Some students may find anxiety or unwillingness to compete against classmates.

• The time involved in developing and implementing a digital game-based curriculum may be much greater than a traditional curriculum.

Summary

Deficiencies exist in student success rate on the social studies section of the Ohio Graduation Test (Ohio Department of Education, 2007b). Furthermore, students are increasingly
being engaged by every aspect of their lives except for school (Prensky, 2005). With these two factors as motivators, the researcher has explored and developed a curriculum model integrating digital game-based learning based on its accolades as being a very engaging and effective learning tool in other forms of education such as military training (Shaffer, Squire, Halverson and Gee, 2005).

With the feedback provided by the expert panel, the researcher was able to assess the validity and potential of the proposed digital game-based learning curriculum. The curriculum model meets the standards in place by the Ohio Department of Education (2002 and 2005) and would effectively educate students in an engaging manner. Furthermore, it has been found that digital game-based learning is an effective learning tool for high school students through the expert panel feedback and the literature review (Prensky, 2001a, 2001b and 2005). However, the proposed curriculum would only work in Ohio high schools with several modifications and adjustments. The curriculum would require enough financial support so that all schools could afford the hardware, software, training and support staff necessary to implement a new, and technology-heavy, curriculum. Furthermore, to adapt to the many styles of learning, the curriculum model would ideally focus on teamwork rather than competition and the course would be an elective for students interested in learning through digital game-based learning.

After the research had been conducted for this study, the researcher came across a video lecture from Michael Wesch (2008). In this video, Michael Wesch, assistant professor of cultural anthropology at Kansas State University, discussed the current and potential educational situation. Michael Wesch found that students want to learn but hate the current “institution” of learning. Furthermore, Michael Wesch found that some faculty members actually have the mentality that “some students are just not cut out for school.” Michael Wesch goes on to deduce
that if “school is for learning” then that statement can be reread as “some students are just not cut out for learning.” Something is wrong. Today’s education system focuses on the educator as the sole source of information and inhibits collaboration (Wesch, 2008). Today’s education system is lacking the engaging qualities of so many other aspects of children’s’ lives and is presenting knowledge in an out-dated manner.

Recommendations

Listed in this section are recommendations for further research and development based on the findings of the researcher and the outcomes of the expert panel’s feedback.

• Compare the aspects of Civilization IV intended to aid in learning with the specific areas of deficiency within the social studies section of the Ohio Graduation Test. The researcher may find that these correlate or that the positive aspects of Civilization IV only relate to sections in which students already are succeeding.

• Research further into the back-end accessibility of Civilization IV and develop a scenario in which students will gain the exact knowledge intended to increase performance on the social studies section of the Ohio Graduation Test.

• After the Ohio Graduation Test is completed, compare the success rate of the digital game-based class to the traditional class. Furthermore, compare the statistics from the digital game-based class to the whole previous year success rate.

• Investigate the capability of world-wide collaboration due to the fact that Civilization IV is offered in many languages.

• Rather than force students to compete head-to-head in games of Civilization IV, have the students work as teams against the artificial intelligence in Civilization IV. This may
reduce the unwillingness to play, develop team-building skills, increase cooperation and create further interest in the subject as students talk strategy.

• Develop curricula for other school subjects and sections of the Ohio Graduation Test to assess success rates in other areas and diminish the possibility of students becoming less engaged in traditional classrooms.

• Develop a curriculum that utilizes other teaching methods, traditional or otherwise, to better round the teaching methods.

• Consider the effects of building teams of students to participate in learning games based around gaming skill levels, gaming experience and content knowledge. Furthermore, consider the fact that statistically females play less video games than males; thirty-eight percent of women play video games (Entertainment Software Association, 2008). Teams should be built to ensure that individuals with less gaming experience are matched with gaming-literate individuals. This style of team-building may also strengthen peer mentoring between students.

• Develop pre-game activities with the intent of teaching students the rules and intricacies of Civilization IV or other game used.

It is the researcher’s goal that further studies will be conducted based on this and other similar studies with the purpose of improving the current educational system to adapt to any style of learner and utilize the countless engaging tools available to educators.
REFERENCES


A GUIDE to the NEW OHIO GRADUATION TESTS for Students and Families

Reading, Writing, Mathematics, Science, Social Studies
Table of Contents

Overview .............................................. 1

Reading .............................................. 2

Writing .............................................. 6

Mathematics ......................................... 8

Science ............................................... 10

Social Studies ....................................... 12

Test-Taking Tips and Strategies ................. 14

Frequently Asked Questions ...................... 16

Graduation Checklist .............................. 18

Helpful Web Sites .................................. 19
Testing and graduation requirements in Ohio are changing for high school students. The Ohio Ninth-Grade Proficiency Tests are being phased out and replaced with the new Ohio Graduation Tests (OGT) to ensure that students are armed with the knowledge they need in this global economy to be successful in the work force and higher education.

The new tests are aligned to Ohio’s new academic content standards, which were adopted by the State Board of Education in English language arts, mathematics, science and social studies.

Sophomores in March 2005 (graduating class of 2007) are the first class responsible for taking the OGT and passing all five tests as a graduation requirement. Students will have multiple opportunities to take the tests during their high school careers.

The purpose of this guide is to provide students and their families with the following information:

- An overview of what may appear on the OGT in reading, writing, mathematics, science and social studies;
- Sample OGT questions;
- Test-taking tips and activities that will help students prepare for the OGT;
- Frequently asked questions about the OGT;
- A graduation checklist;
- Helpful OGT Web sites.

While this OGT Guide does not provide an exhaustive list of everything students should know to pass the OGT, the Ohio Department of Education has prepared this tool as one of many resources that students can use to review a sampling of the knowledge and skills they will need to master in order to pass the OGT.

The Ohio Department of Education (ODE) encourages students and families to talk with their high school teachers and/or guidance counselors to find out more detailed information about the OGT. Additional information and resources also can be found on the ODE Web site at www.OhioAcademicStandards.com and www.ode.state.oh.us/proficiency/OGT.
The OGT in social studies contains 32 multiple-choice, four short-answer and two extended-response test items that measure student achievement related to the seven academic content standards.

Social Studies Academic Content Standards

- History
- People in Societies
- Geography
- Economics
- Government
- Citizenship Rights and Responsibilities
- Social Studies Skills and Methods

The content covered by the OGT encompasses world studies from 1750 to the present, and United States studies from 1877 to the present. Many test items will present data and information as text, tables, charts, graphs, maps and illustrations. Students should be able to apply this data and information when answering questions posed in the test items.

The overview below describes examples of concepts and skills assessed by the OGT in social studies for each of the seven academic content standards.

Visit www.ode.state.oh.us/academic_content_standards/acssocialstudies.asp for a complete list of the social studies academic content standards.

HISTORY
- Explain cause and effect relationships among historical developments, including industrialization and imperialism.
- Show connections among historical developments occurring in different decades and centuries, such as World War I, World War II and the Cold War.

PEOPLE IN SOCIETIES
- Describe interrelationships that exist between cultural groups from exchanges of cultural practices to instances of discrimination and conflict.
- Analyze the influence of cultural perspectives on the actions of groups.

GEOGRAPHY
- Use maps and geographic data to analyze changes brought about by human activity.
- Analyze the characteristics used to define geographic regions.

ECONOMICS
- Compare how different economic systems determine what goods and services to produce, how to produce them and who will consume them.
- Explain various roles the U.S. government plays in the economy, such as providing public services and regulating economic activities.

GOVERNMENT
- Explain how applications of the U.S. Constitution have changed due to amendments ratified since Reconstruction.
- Analyze how various systems of government, ranging from democracies to theocracies, acquire and use political power.

CITIZENSHIP RIGHTS AND RESPONSIBILITIES
- Analyze the methods people use to bring about changes in governmental policy and in systems of government.
- Describe how the exercise of individual rights is balanced against the rights of others and the welfare of the larger community.

SOCIAL STUDIES SKILLS AND METHODS
- Examine sources of information to determine if they are reliable and credible.
- Show how to use evidence to support or refute a position on an issue.
Sample OGT Social Studies Test Items

Sample OGT Social Studies Short-Answer Question

Aligned to Economics Standard

Below is a sample OGT short-answer question and a sample multiple-choice question. Following the short-answer test item is a response written by an Ohio student, as well as a notation explaining why the student received full credit for the answer.

Reserve Requirements for Banks
One way the Federal Reserve System can affect the money supply in the U.S. is by setting the reserve requirements for banks. The reserve requirement is the percentage of deposits that a bank must keep on reserve. If, for example, a bank has $1,000,000 in deposits and the reserve requirement is 12%, it must keep $120,000 in reserve. This means that the bank can lend up to $880,000.

Based on the passage and your knowledge of the Federal Reserve System, if the Federal Reserve decided to increase the reserve requirement from 12% to 15% for its member banks, what would the banks do, what would be the effect on the money supply, and what would be the general impact on the economy?

The test item is worth up to two points. The following Ohio student's response achieved all two points.

If the federal Reserve decided to increase the reserve requirement from 12% to 15% for its member banks, then the banks would have to keep more money in reserve. The amount of money the banks would have to lend would decrease. Our economy would not be as productive because there wouldn't be as much money for people to borrow and improve the economy with.

The response shows complete understanding of the task because the student provides a clear and accurate response to each of the three parts of the question; the student explains what the banks would do (keep more money in reserve); what the effect on the money supply would be (amount of money the banks would have to lend would decrease); and the general impact the increase in the reserve requirement would have on the economy (economy would not be as productive because...).

Sample OGT Social Studies Multiple-Choice Question

Aligned to History Standard

During World War II, many Japanese-Americans living along the West Coast of the U.S. were relocated from their homes to government-run internment camps.
Which of the statements below best summarizes the reason this occurred?
A. the desire to avoid entering the war
B. the need for workers in factories at the internment camps
C. the desire of most Japanese-Americans to escape to Japan
D. the fear that Japanese-Americans might betray the United States
(Correct Answer "D")

Note: These sample test items have not been subject to the same rigorous review and field testing as have the actual Ohio Graduation Test items.