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Evaluating Social Change Games:
Employing the RETAIN Model

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ABSTRACT

The RETAIN Model is a game design and evaluation model for serious games. In this study, educators evaluated social change web-based and mobile app games using the RETAIN model rubric. In general, web-based games scored higher on the RETAIN rubric than their mobile app counterparts. In addition, the educators analyzed the social change games for their "hidden curriculum." In some cases, the rubric and "hidden curriculum" contributed to educators altering the way they used the games they had appraised by supplementing context, incorporating discussion, or not using the games at all. The RETAIN model rubric offered educators a tool to evaluate digital games.

KEYWORDS

Apps Evaluation, Apps Integration, Knowledge Transfer, RETAIN Model, Teachers

INTRODUCTION

As educators pursue active learning options to engage and incentivize students to learn course content, incorporating games in learning has been found to be an active learning option that moves students from being passive recipients to active learners (Koster, 2013). The interactive nature of games, students' motivation to play, increased engagement, and advancing technologies have teachers vested in planning instruction that includes gamification (Dominguez, et al. 2013) and serious games (Gouveia, Lopes, & de Carvalho, 2011; Iten, & Petko, 2016). Research regarding the pedagogy of serious games in teaching and learning is scant. Further, educators are often unaware as to which games are the most effective for transfer of learning (Kenny & McDaniel, 2011) and how to incorporate serious games (Azadegan, 2012). Teacher's dispositions and beliefs towards the academic benefits of games and personal efficacy for implementing games in instruction lags in comparison to the research (Kenny and Gunter, 2011).

As access to mobile devices burgeons in education, through the availability of tablets, smartphones, and laptop programs, the use of mobile and Web-based digital game apps has grown (Seilhamer, Chen, Bauer, Salter, & Bennett, 2015). Increased accessibility, devices ease of use, and students' natural adeptness towards mobile apps and digital learning afford new and multiple active learning opportunities. Additionally, since many apps and Web-based games are free or low cost, instruction of academic content may be supplemented through web and mobile apps with their affordances of personalized and active learning. By fostering, "learning by doing" deeper learning can be promoted (Altamirano and Jaurez, 2013) and learner-centered pedagogies supported (Crompton, 2013).

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Mobile and web-based game apps are not only incorporated into learning to compliment core academic content areas, but digital game apps have been assigned to inform and persuade players regarding social and community concerns. Social changes games are characterized by their purpose to develop: (a) a social issue awareness (Schreiner, 2008), (b) personal empathy (Mariani, & Gandolfi, 2016), and (c) positive actions towards community change (Gerber, & Gaitan, 2017). Apps for social change leverage technology to inspire community action (Fogg, 2003). Examining this genre of mobile and Web-based apps has not been examined beyond a pilot case study (Campbell & Gunter, 2017).

Screening the validity of educational mobile apps intended to support classroom instruction offers teachers a rationale for including mobile apps in instruction. For these reasons, the current study was developed to assess the effectiveness of Web-based games and mobile game apps for social change learning. A rubric built on the RETAIN model provided a means for educators to quickly assess social change games for transfer of knowledge. The RETAIN model, which was developed by an instructional designer, an educator, and a game designer (Gunter et al. 2007; Kenny & Gunter, 2011), was chosen because it had previously been utilized to assess console-based and computer-based games (Gunter, 2011; Zhang, Fan, & Xing, 2010). Further, the RETAIN model has been used as a framework for the design of a multi-player tablet application developed to teach students about the water cycle WaterOn! (Dos Santos., Strada, Martina, & Bottino, 2016). Because of these reasons, the following study, utilized the RETAIN model rubric to assess apps for social change for knowledge transfer.

DIGITAL GAMES

Digital games are pervasive in our culture. In the United States, approximately 97% of children and adolescents play games daily for at least one hour (Granic, Lobel, and Engels, 2014). Lee and Hammer (2011), attributed students' motivation to play games to the social, emotional, and cognitive connections that take place when players are engaged in game playing. While motivation can contribute to game play and engagement, motivation does not ensure learning. However, some studies attribute game play to improved cognitive skills such as increased working memory (Barlett et al., 2009) and problem-solving, although multiple studies yielded differing results (Connolly, 2012).

Digital game mechanics such as music, narrative, video, and images contribute to learners' interest and user experience. The storyline, music, and visuals are immersive elements that promote interactivity and are found in most video, console, and game apps, although these elements may have technological limitations (console versus mobile apps). However, when there are technological limitations as realized in mobile application, digital resources like games can be incorporated to gamify the learning experience. Mobile game apps and Web-based games share elements of gamification including but not limited to both are: (a) interactive; (b) problem-based; (c) manual-free; (d) includes visuals; (e) fosters a fail-safe environment; (f) personalized environment; (g) feedback-driven (Kenny, Gunter, & Campbell, 2017).

WEB-BASED SOCIAL CHANGE GAMES

Technology contributes to social change in a myriad of ways (Fogg, 2003). One such way is Web-based games for social change. These scenario-based games immersed the learner in a story that informed the player about social issues from varying perspectives to increase awareness and promote advocacy (Campbell & Gunter, 2017). Further, while playing these games, players are engaged in making choices and experience the consequences of their decisions in a fail-safe environment.

Within the genre of social change games, content varies and may include games to promote sustainability, proper health care, human rights, civics, conservation, and other social problems. Games for social change have been incorporated into teaching and learning in lieu of lectures, as an adjunct to a lecture, or as an introduction to a local social issue prior to community advocacy. These types of games have been identified as influencing explicit and implicit actions and attitudes

(Alhabash & Wise, 2012; Edwards, 2015; Shreiner, 2008). Social change games are often designed with a hidden curriculum, teaching in a way that the learner may be unaware of (Portelli, 1993). A hidden curriculum by definition includes implicit values, norms, behaviors, and attitudes (Skelton, 1997). While it is known that students who play social change games tend to be more empathetic and active in social change (Peng, Lee, & Heeter, 2010), it is unknown if games for social change have the capacity for knowledge transfer as measured by the RETAIN model. Therefore, games for social change on mobile app and Web-based platforms were investigated in this study. Because of the moral and ethical aspects of these types of games, additional questions were added to the RETAIN rubric for reviewers to consider the constructs of bias, morals, ethics, and values. The evaluation of these constructs was to inform reviewers of the point of view with the application being reviewed.

THE RETAIN MODEL

Previous research suggested that serious, often called educational, games have the potential to effect learning by increasing interactivity and providing active learning opportunities that engaged students (Kebritchi & Hirumi, 2008). The importance of games and learning were the impetus behind the relevance embedding transfer adaptation immersion and naturalization (RETAIN) Model. RETAIN originated from the systematic evaluation of game design theory in comparison to traditional learning models and strategies. (Gunter, Kenny, & Vick, 2007). Their scrutiny and attention considered representations of the theories, methods, terminologies, and contexts, identified in game design, play, and instructional design.

The RETAIN model theory includes theories, systems, and research of Gagné, Keller, Piaget's, and Blooms'. Gagné's 'Nine Events of Instruction' have been foundational guiding principles for game software development and design (1985). RETAIN valued Keller's (1982) conceptual framework of motivation and Bloom's (1956) hierarchical model of cognitive domains for knowledge acquisition. RETAIN considered the importance of scaffolded instruction, in that academic content acquisition opportunities were built into the design of games; learners/players could advance to the next level (i.e., 'level up' or 'leveling up").

Game developers' primary focus when creating games includes gameplay mechanics through the techniques employed with in a game, challenges and disruptions. Conversely, classroom educators are concerned with academic content found within the game. Story/narrative has been shown to be an effective mechanism for contextualizing content in the learning process (Kenny & Gunter, 2011; Havens, 2007). Gunter, Kenny, and Vick (2007) found that in general, game design ideologies appeared to be missing schema and dis-equilibration as supported by Piaget (1969), as a result, these concepts became a major emphasis in the RETAIN Model. The RETAIN model incorporated game mechanics and content in its scoring schema (See Figure 1.). The E in the RETAIN model (embedding) urged game designers and game reviewers to analyze the story of serious games for convincing fantasy or storyline to contextualize game content (Kenny & Gunter, 2011).

COMPARATIVE GAME ASSESSMENT MODELS

There have been various attempts to create assessments of serious/educational games. Most, however, tend to focus on the technical aspects and processes, rather than instructional/educational theories and best practices. One such attempt to create a value rubric was provided in El Borji and Khaldi' (2015). They presented cases and citations of game designer scholars whose perspectives emanated from the process side of game design as a means to validate their matrix. For example, the design aspects considered included accuracy of content, degree of difficulty, and consistency. All of these are valid perspectives in the process of design; however, while these researchers did approach pedagogy as a process, they never attempted to evaluate the learnability of the content or the implications behind motivation (Keller, 1989). The researchers did consider other important technical aspects such as

Figure 1. RETAIN model rubric for mobile game apps

Retain Model Rubric
(Gunter, Kenny, Vick, 2008)

Directions: After playing the game being evaluated, complete the Discussion, Level, and calculate the Score similarly to the way it was on the website and/or in the article.

Name of Game: _____
Game Developer: _____ Platform – Android/IOS: _____
Student Evaluator Name: _____

Element	Description	Discussion/ Level	Weight	Score
Relevance	i) Presenting materials in a way relevant to learners, their needs, and their learning styles, and ii) Ensuring the instructional units are relevant to one another so that the elements link together and build upon previous work.	**Level =**	**1**	
Embedding	Assessing how closely the academic content is coupled with the fantasy/story content where fantasy refers to the narrative structure, storylines, player experience, dramatic structure, fictive elements, etc.	**Level =**	**3**	
Transfer	How the player can use previous knowledge and apply it in other areas.	**Level =**	**5**	
Adaption	A change in behavior as a consequence of transfer.	**Level =**	**4**	
Immersion	The player intellectually investing in the context of the game.	**Level =**	**2**	
Naturalization	The development of habitual and spontaneous use of information derived within the game.	**Level =**	**6**	
		Total		**??/63**

Other Notes:

granularity of the graphics, browsing design, installation, and system requirement. All of these elements are necessary and effect play and the ability of the game to deliver instruction, but these game mechanics are insufficient criteria to assess whether learning takes place.

Other researchers have developed similar frameworks that do touch on some of the components in RETAIN and seem to fail to address or eliminate the elements that would integrate game design

theory and instructional design theory with standard learning theories. Yusoff, Crowder, Gilbert, and Wills (2009) proposed a conceptual framework for scenario-based game design for serious games. The theoretical framework focused on the games' design system architecture and related tools in the game development. Various elements are similar in nature to the RETAIN model. There were no clear connections to learning theories or instruction learning theories provided, although the authors do reference the ideas of Gee (2007).

In contrast, the RETAIN Model is simultaneously based on serious game and instructional design best practices. In the original research that led to RETAIN, the researchers determined anomalies and gaps in the design that could potentially prevent satisfaction of the goals and expected outcomes of the game play. In a follow-up gap analysis study, Kenny and Gunter (2011) verified there was a considerable potential for embedding and authenticating the instructional content in game architectures. All, Castellar, and Van Looy (2015) have contributed to the literature on assessment of digital-games by developing a conceptual framework for evaluating learning effectiveness (defined as attainment of effective goals in a real-world context). The elements considered in this framework, although not inclusive game mechanics, did consider learning, motivational, and efficiency outcomes. Through the design and development of the RETAIN Model and rubric the authors addressed the terms and elements used between the educational environments and game industry. The RETAIN Model has been used to evaluate serious computer-based games, console games, and mobile learning apps (Campbell, Gunter, & Braga, 2015; Campbell, Gunter, Kenny, 2015), since it addressed the elements a game must include to teach and support knowledge acquisition (Gunter, Kenny; Vick, 2008; Kenny & Gunter, 2011).

The following investigation utilized the RETAIN model and additional questions to investigate social change Web-based and mobile game apps. The research questions included:

Research Question 1 (RQ1): What were the differences between mobile apps versus Web-based games ratings on the RETAIN model rubric?

Research Question 2 (RQ2): How does using the results of the RETAIN model effect the use of social change games and mobile game apps in the classroom over time?

Research Question 3 (RQ3): When evaluating the "hidden curriculum" of social change games, how did the results effect teachers decisions to incorporate the games for instructional purposes?

METHODS

The overarching purpose of the study was for K-12 teachers to investigate mobile apps and Web-based games for social change for potential knowledge transfer. The study took place over the course of two semesters. The hypothesis for this study: K-12 teachers who analyzed games using the RETAIN Model Rubric would: (a) indicate they would use the rubric again; (b) adopt apps and games that indicate the highest level of knowledge transfer on the RETAIN model rubric; and (c) identify the hidden curriculum.

The study included mobile apps and Web-based scenario games. The study did not include arcade game. Arcade games and apps are most noted for their repetitive actions and relative simplicity. Specific mobile apps and Web-based games were selected based on their stated instructional learning objectives and an analysis of their educational content. Some of the games considered in the study were currently being used in K-12 classrooms. Web-based games were from the genre of games for social change.

Research Design

The study utilized a concurrent triangulation design (see Figure 2). Each semester, all data types (quantitative and qualitative) were collected concurrently (Creswell, 2015). To confirm findings, data were analyzed separately by type (qualitative and quantitative) and by semester. Then the qualitative

and quantitative data were combined for triangulation purposes. The study was designed to explain how the RETAIN rubric was used by K-12 teachers to evaluate mobile apps and Web-based games. Teachers' perspectives regarding the immediate and long-term use of the RETAIN model rubric were examined through interviews and focus groups to provide a phenomenological perspective of implementing the RETAIN rubric for curriculum choices.

Participants and Settings

Study participants included an intact group of K-12 teachers N=25 in a graduate education program at a large university in the southeastern United States. The participants n=12 (semester 1) and n=13 (semester 2) were either earning their master's degree or completing a certificate program in educational technology, instructional design, or e-learning. Demographics were collected each semester (See Table 1). Eighty percent of the participants were female. Fifty-six percent were under the age of 40. Eighty-four percent had less than 10 years teaching experience. The mode of instruction for these participants was a hybrid environment. Every third week of the semester, the participants were in the face-to-face classroom while the other two weeks they received instruction through an online learning management system.

Instrumentation and Timeline

Pre-study Survey

The pre-survey instrument was designed by the researchers to collect baseline data related to: (a) types of devices used in instruction, (b) participants' practices incorporating games in instruction, and (c) prior experiences evaluating games including the RETAIN model. After completing the pre-study survey, students read about the RETAIN model, serious games, and mobile apps and instruction. All quantitative data was collected through Qualtrics and analyzed through SPSS. Online discussions were analyzed through NVivo 11.

RETAIN Model Rubric

The RETAIN model rubric was introduced to the participants after they read the related literature on RETAIN. As a class, participants reviewed a game and completed the RETAIN rubric. The intent of this activity was for the K-12 teaches to practice completing the rubric and to scaffold the K-12

Figure 2. Study design and data collection points

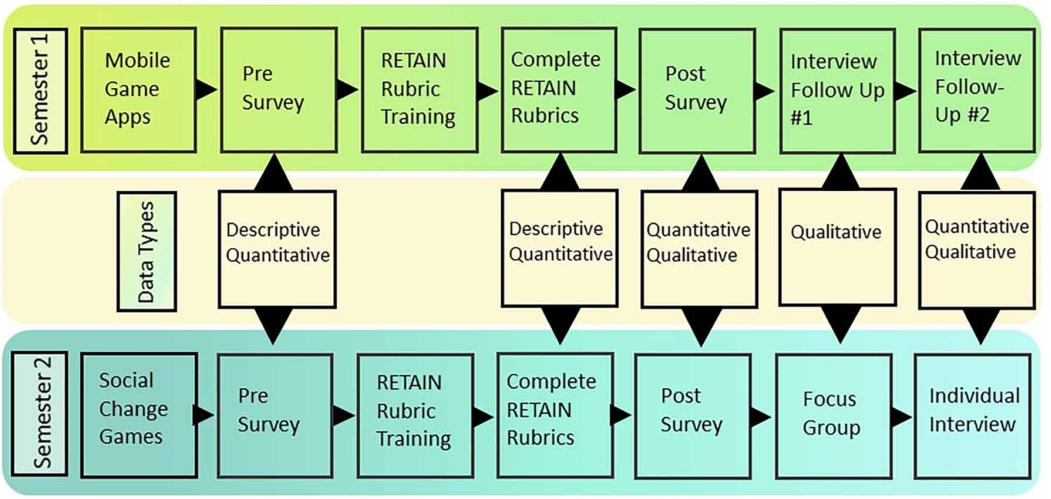


Table 1. Study demographics

N=25	Female	Male	Age 23-39	Age 40-55	Teaching Experience < 5 years	Teaching Experience < 10 years	Teaching Experience < 15 years
Semester 1	9	3	8	4	6	4	2
Semester 2	11	2	6	7	3	8	2
Total	20	5	14	11	9	12	4

teachers' skills of evaluating games with the RETAIN rubric. In semester two, the RETAIN rubric was slightly modified to collect information specific to social change games (see Figure 3). Participants evaluated either five mobile game apps (semester 1) or three games for social change (semester 2) during a four-week period. Participants shared their evaluations with each other through discussion at the end of the four-week period.

The RETAIN scoring rubric has an assigned point value of 0-3 for the various six elements of game design. Further, each element was weighted according to its perceived importance. As with previous administrations, the weighted order is Relevance, Immersion, Embedding, Adaption, Transfer, and Naturalization with Naturalization assigned the greatest weight. The highest rating an app could receive was 63 points. The higher the score, the stronger the capacity of the mobile game application to support or supplement knowledge transfer. Participants recorded and calculated the appropriate points for each category. Participants followed up with a written rationale that included specific evidence or the lack of evidence to support their score (see Figure 1 and 3).

Post-study Survey

Immediately after the final class discussion related to RETAIN, participants completed the post survey. Questions in the post survey were asked to determine how the K-12 teachers completed the rubrics, the lessons they learned, and to ascertain their position and dispositions regarding mobile game apps and Web-based games. Follow up questions for the post survey were considered from the post-survey analysis.

Post Interviews and Focus Groups

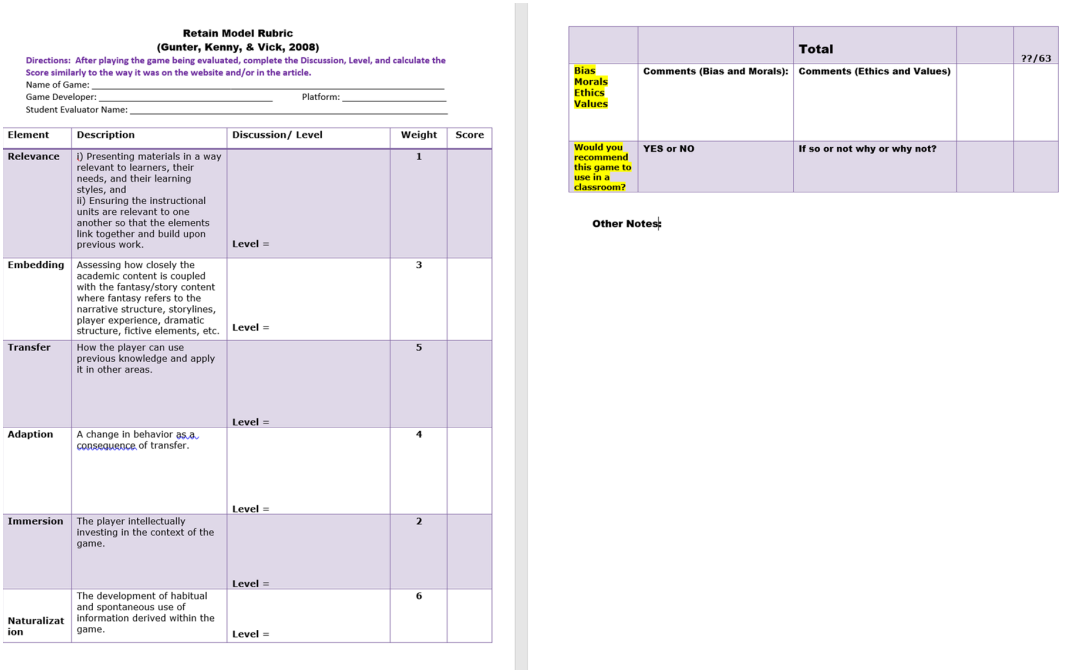
Finally, post interviews were conducted by phone. The focus group in semester 2 was conducted in a face-to-face environment. The interview questions were designed to provide feedback about the long-term effects on both the K-12 teachers (participants) and their students. One person followed up by email.

RESULTS AND DISCUSSION

Research Question 1: What were the differences between mobile apps versus Web-based games ratings on the RETAIN model rubric?

Games are developed for multiple platforms; knowing if platform makes a difference is beneficial when knowledge transfer is a priority. To determine the answer to this question, the overall scores on the RETAIN rubrics were compared. As anticipated, mobile apps scored lower overall as compared to Web-based games. Mobile game apps score ranges for the apps reviewed were from 8 to 52. Web-based games for social change scores ranged from 39 to 63 (which is the maximum amount of points a game can earn on the RETAIN rubric). The technological constraints of the mobile device (smartphone and tablet) may have contributed to the lower overall scores of mobile devices to

Figure 3. RETAIN model modified for web-based social change games



Retain Model Rubric
(Gunter, Kenny, & Vick, 2008)

Directions: After playing the game being evaluated, complete the Discussion, Level, and calculate the Score similarly to the way it was on the website and/or in the article.

Name of Game: _____

Game Developer: _____ Platform: _____

Student Evaluator Name: _____

Element	Description	Discussion/ Level	Weight	Score
Relevance	i) Presenting materials in a way relevant to learners, their needs, and their learning styles, and ii) Ensuring the instructional units are relevant to one another so that the elements link together and build upon previous work.	Level =	1	
Embedding	Assessing how closely the academic content is coupled with the fantasy/story content where fantasy refers to the narrative structure, storylines, player experience, dramatic structure, fictive elements, etc.	Level =	3	
Transfer	How the player can use previous knowledge and apply it in other areas.	Level =	5	
Adaption	A change in behavior as a consequence of transfer.	Level =	4	
Immersion	The player intellectually investing in the context of the game.	Level =	2	
Naturalization	The development of habitual and spontaneous use of information derived within the game.	Level =	6	

		Total		??/63
Bias Morals Ethics Values	Comments (Bias and Morals):	Comments (Ethics and Values)		
Would you recommend this game to use in a classroom?	YES or NO	If so or not why or why not?		

Other Notes:

laptops and Web-based games. Consistently, participants indicated that the mobile game apps lacked Immersion qualities. One participant noted, "The player/learner is not involved cognitively, physically, psychologically, or emotionally in the game play or content." Conversely, participants indicated that some Web-based games had more immersive qualities. "The graphics and game play immerse the learners in the experience, but do not distract from the learning process. The different cases made the learner feel like a true detective." The range of scores support that RETAIN measured Web-based games higher than mobile game apps (See Table 2). While the scores were generally lower in the immersion category, they were also lower in the transfer area.

Since the RETAIN model was designed to evaluate and create console and serious games (Gunter, Kenny, Vick, 2007) it is reasonable to consider that Web-based games would score higher than their mobile game app counterparts.

Research Question 2: How does using the results of the RETAIN model effect the use of social change games and mobile game apps in the classroom over time?

All participants had no prior experience with or knowledge of the RETAIN model. Forty-eight percent of the participants had incorporated digital games as part of their curriculum. The other 52% indicated that they did not use games. Their reasons for game usage included the time it took to incorporate games, which would limit their instructional time and focus, and the lack of games for their content area. Games were a part of instruction at all K-12 grades represented. Digital games were most prominent in K-8 grades. Those who did not incorporate digital games mentioned using games for review like *Jeopardy,* or $*100,000 Pyramid.*

The data to answer this research question were analyzed from the post surveys, interviews, and focus group. Open-ended comments were coded as positive, negative, or neutral. These comments were then coded and grouped. The categories that emerged from the post survey after dual-coding

Table 2. Average score difference for mobile game apps and web-based games by category

		Mobile Game Apps	Web-based Games
R	Relevance	1-3	1-3
E	Embedding	3-6	3-9
T	Transfer	5-15	5-15
A	Adaptation	4-8	8-12
I	Immersion	2-4	4-6
N	Naturalization	6	6-18
	Average Score Range	21-42	27-63

included: (a) future usability; (b) content accuracy; (c) student engagement; (d) curriculum support; and (e) prerequisite skills. The comments were counted and reported (See Table 3). Fifty-two unique Web-based games were analyzed along with 43 Mobile game apps.

The middle school teacher/reviewer/participant quoted above recognized that even though the game had instructional qualities and scored in a reasonably high range, the text length may be counterintuitive to gameplay thereby suppressing potential knowledge transfer.

GAMES OVER TIME

During the follow up interviews and focus group for both semesters, a smaller group of participants n=7 agreed to be interviewed. The participants were asked how the RETAIN model had impacted their current game choice and usage. Seventy-one percent of the K-12 teacher/participants interviewed incorporated games evaluated with the RETAIN model rubric. These participants had either evaluated

Table 3. Initial response of all games after completing the study

	Positive	Negative	Neutral	Sample Comments
Future Usability	14	9	4	"The developers suggested using the game with kids who are having trouble adjusting socially. I think it could be used to help teach all kids some social skills." "I would not use this game with my students. It does not have educational value because it lacked content."
Content Accuracy	3	2		"The academic content of the game is closely related to true experiences and reality." "This application was not at all educational and if students were to play this game, they would not learn much other than how to maneuver the phone appropriately to go over or under various obstacles."
Student Engagement	18	5		"It's very simplistic and doesn't hook the user. NO IMMERSIVE QUALITIES." "I can see my students wanting to play this game for hours. It is intriguing."
Curriculum Support	15	3	3	"good source to reinforce preexisting knowledge or post-instructional acquired knowledge"
Prerequisite Skills	5	7		"I would not recommend the game as a primary source of instruction because of the lengthy text learners must read to get to the point of mastery in gameplay."

previously used curriculum-related digital games or adopted new curriculum-related games that were evaluated based on the RETAIN model. Two participants (teaching Language Arts, and Math) added social change games to support a unit in their curriculum. Of those participants interviewed, all but one participant chose Web-based games instead of apps. Three participants discontinued use of curriculum-related games based on low scores on the RETAIN rubric. One participant indicated that they kept a low scoring Web-based app because the intent of the app was awareness and not knowledge transfer. Finally, of the 23 Web-based games and 14 Mobile game apps reviewed among the participants that participated in follow up interviews and the focus group, only 8 of the Web-based games, and 4 of the Mobile game apps were being utilized within the participants classroom.

Research Question 3: When evaluating the "hidden curriculum" of social change games, how did the results effect teachers decisions to incorporate the games for instructional purposes?

When evaluating social change games, participants were asked to identify explicit and implicit bias, morals, ethics, and values. The data was coded for positive and negative comments. More comments were made about bias than morals, ethics, and values. Areas of perceived bias included gender, ethnicity and race, culture, and social structures. Most comments related to the visuals that the teachers observed.

For instance, the area of ethnicity and race statements that addressed bias included, "Within the game, the clients and lawyers are of various genders and race." Yet another participant noted, "Learners are able to choose the games' guiding avatar's gender and skin color, which is a feature students like and eliminates bias." However, not all comments were positive in this area. When referencing a game about healthy food consumption, the reviewer commented, "While the images for the case files were diverse in nature, there was no Asian or Indian representation. The foods were more Americanized and yet our students are not all American." During the follow-up interview, one teacher explained how they handle this type of bias. She stated, "I tell my students prior to playing the game that not all types of cultures were represented but the principles of the games are important." However, another teacher stated that for some students, playing these games "presents a challenge because of religious or cultural food restriction such as those that do not include dairy or meat." He further stated, "It could indicate to some that those who follow this type of eating are privileged over others who don't."

Social structure bias was observed in several of the games. "For kids living in non-traditional home environments or homes with limited resources, they may not relate to some of the scenarios because the scenarios were not diverse enough." Another participant observed, "Only traditional families were represented." Implicit bias in social structure was observed, but less frequently. Other biases took the form of stereotypes and were related to the avatars' attitudes and values, "Some avatars were written to be self-serving and may come off as insulting and divisive, these avatars were over-simplified to make an exaggerated point."

Comments regarding ethics, morals, and values observed were minimal. In the follow-up interviews the lack of recognition of ethics, morals, and values were addressed. Participants agreed that it was easier to address overt bias than to look at implicit bias, values, ethics, and morals. One teacher/participant had her students critically evaluate an assigned social change game, which led to multiple discussions. The participants in the focus group did concur in every reviewed game that valuing human life was at the forefront. Even if there were destruction of human life, the games would implicitly counterbalance destruction with preserving or uplifting humans. The participants did not eliminate a game because of the hidden curriculum; rather, they altered the implementation of the games.

CONCLUSION

The study confirms previous studies (Campbell & Gunter, 2015a; 2015b; Kenny, Gunter, Campbell, 2017) that teachers' utilizing a tool to review digital games affects the use and implementation in teaching and learning. Benefits of the study for the participants included: (a) thorough evaluation of digital games for evidence of knowledge transfer; (b) gaining new perspectives about the game mechanics; and (c) identifying the hidden curriculum within social change games. Using the RETAIN model rubric during the study translated to authentic learning environments. Participants (K-12 teachers) utilized the RETAIN model rubric after the study to benefit their own K-12 students by choosing a game that met their objective.

The RETAIN model rubric successfully aided in the evaluation of a specific genre of Web-based games supporting the initial intent of the RETAIN model (Gunter, Kenny, & Vick, 2007). It was determined in this study that Web-based games scored higher on the RETAIN model rubric than their mobile game app counterparts. However, this does not suggest that mobile game apps should not be used. There are multiple educational purposes for incorporating games. If knowledge transfer is the aim of incorporating digital games in learning, a higher scoring game or app offers greater potential. The authors recommend in future studies exploration of other genres of games. Further recommendations include formalizing methods for identifying the hidden curriculum of social change games.

The limitations of the present study included all of the participants were in a graduate degree program and were trained to use the rubric. Therefore, the results may not be the same when someone is not trained to use the rubric. In follow-up interviews, the participants expressed increased efficacy in their rubric ratings suggestive that training to use the rubric yielded a more accurate score. The relationship between higher scoring apps and web-based games and improved achievement was not the purpose of the study. Therefore, future studies could include the validation of the RETAIN model related to achievement.

Reviewing games using RETAIN and observing the "hidden curriculum," did influence the way teachers implemented the games they reviewed both in the immediate use and over time. The names of the games reviewed by the teachers in this study were not the focus of this study. Rather, the purpose of the study was to analyze the RETAIN model as a tool to evaluate mobile and Web-based games for classroom use that would best support curriculum. In conclusion, the RETAIN model rubric offers educators a tool to evaluate digital games for transfer of knowledge. While designed for console and stand-alone games, the RETAIN model rubric has been successfully used to evaluate Web-based social change games and mobile apps.

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