Heritage language learning – what we can learn from video game developers

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Developing computer games is a multi-million dollar business. Game developers have employed multiple techniques to entice people to not only play a game, but to continue to play it for an extended period of time. So effective have these strategies been that some gamers have neglected their own personal well being just to continue to play these games (Ivanov, 2005). Such extreme examples illustrate the power that carefully designed computer game programs can have. What is the source of the power embedded in the game design and might this knowledge provide heritage language instructors with insight into ways to increase learner motivation and engagement in positive ways?

Edutainment

Combining education and computer applications, especially gaming, has yielded a field known as edutainment. As the name suggests, edutainment emphasizes learning alongside "fun" or entertainment. Although the term seems new, its history dates back to WW2 (White, 2003; Van Riper, 2011) and includes a variety of forms of educationally oriented media programming such as film (e.g. documentaries by National Geographic, TED talks), television (e.g. Walt Disney family movies), radio (e.g. CBC, BBC and public broadcasting), museums (e.g. science centres), and educational theatre. Today's computer game developers have built on this tradition by integrating into computer games learning about subject content, historical events or concepts as well as learning skills while playing. They have researched what they call the entertainment factor (EF) or *fun* – what makes people want to continue playing a game.

In educational circles the concept most closely related to EF is engagement: "student's willingness, need, desire and compulsion to participate in, and be successful in, the learning process promoting higher level thinking for enduring understanding." (Bomia et al, 1997, p. 297) McLaughlin (2005) further distinguishes learners' cognitive engagement as procedural (following the rules) or substantive (following the rules and being able to apply them within new contexts). For example, a learner who attends to the rules or patterns for grammar is procedurally engaged while one who not only attends to the rules but can also apply them to new vocabulary

is substantively engaged. Thinking has been a primary focus in educational research; however, the emotional or affective dimension of learning has not (e.g. Nunan, 2004).

Entertainment factor (EF)

Malone (1980), LeBlanc (LeBlanc, 2004; Hunicke, LeBlanc, & Zubek, 2008) and Lazarro (2012) are leaders in designing video games and applying EF. As early as 1980 Malone identified three heuristics of games that contributed to EF: challenge, fantasy and curiousity. LeBlanc's Taxonomy of Game Pleasures expands this to "eight kinds of fun" to maximize and sustain user interest (Hunicke, LeBlanc, & Zubek, 2008). They are summarized in Appendix A. The taxonomy helps us understand how the old fashioned game *Charades* is designed to develop Fellowship, Expression, and Challenge while modern digital games like *Quake* are designed to experience Sensation, Challenge (competition) and Fantasy. It also helps us to see that some game players submit to game play as a habitual past time that involves for them minimal thinking or engagement.

For Nicole Lazzaro, founder and CEO of XEO games, a major game development company, there are four types of fun: 1. The **hard fun** of challenge and mastery; 2. the **easy fun** of exploration, role play, and storytelling; 3. The **serious fun** that emerges from feelings such as frustration or relief associated with experiencing real world issues and contexts (e.g. fire fighter simulations or eco games); and 4. **people fun** that renders amusement, laughter, social mechanics, and bonding while playing. Lazzaro (2010) claims that the most successful games on the market include at least three of these four factors (e. g. *World of Warcraft* or the *Simms* or *Myst)*.

A number of lessons can be gleaned from digital game designers that can be applied to HL learning and engagement. In this paper I discuss five ways that game developers exploit the entertainment factor: game architecture, sensory stimulation, building challenge, creating possibilities for social interaction, and narrative fantasy or storytelling and then propose ways to apply them to the HL classroom.

Game architecture

The structure or plan of a game is called its architecture. The basic architecture includes the content and rules of the game. A major feature of game architecture is player *choice*. Choice creates in the player a strong identification with the game. When developing the architecture, designers organize the content, layers or steps of the games into a tree-like diagram that shows pathways to gaining points (success) and consequences of failures. They seek complexity in order to keep players curious about what will happen next and thus wanting to continue playing the game. Additional *game mechanics* can also contribute to enticing the player to want to continue playing the game such as having a time limit, using "bonus" features or ways to earn more points, adding visual or audio confirmations for correct answers or pathways, or offering hints to overcome challenges for reduced points.

Sensory stimulation

Playing a digital game is a multisensory experience. As digital natives, today's youth are used to playing highly refined games with professional grade production value. After opening and logging into the game, the user usually begins by selecting a starting point on an introductory screen. The user *touches* the screen or the controller to begin, thus enacting what LeBlanc calls sensation fun.

In addition to the sense of touch, other senses that can be activated are sight and sound. Learners particularly like to *see* aesthetically appealing characters. On one research project I was involved in, one team member (Victor Wong) developed a series of characters that aimed at being appealing and interesting to a junior high audience. (Bilash et al, 2012) See Appendix B. The multi-lingual and multi-racial team discussed at length what the the characters should look like, including their colour, general shape, hair style, eye shape, facial features, anatomical proportions, gender, apparent age, and relative relationship status to other characters. During the research phase of this project the education team then observed and inquired about character appeal during the user testing phase. Students found the characters "cute", "interesting", "funny", "colourful" and "cool".

The sensation of music and sound is also an important aspect in motivating and capturing a user's interest in playing any game (Schell, 2008). "Audio effects such as sound and music, are as important as visual effects to keep the players motivated and engaged." (Cheng et al., 2012)

Building challenge

One of the attractions of video games is the challenge that learners feel to do better each time they play the game. Seeing points or levels of attainment gives players a personal bar against which to compete next time they play the game. Further, players experience the emotional sensation of 'surprise' and reward of gaining bonus points when they reach higher levels of difficulty in the game. Each challenge in a game requires more skill, such as speed of reaction, and sometimes even a review or application of previously learned skills.

Creating possibilities for social interaction or people fun

Many learners like interactive games, meaning that they like to solve problems together and develop relationships with other players – perhaps by playing with a partner or perhaps by competing against others. In observing learners playing games in our research we discovered how easily students began to communicate and share with one another and how this seemed to heighten the interest in the game (Bilash et al., 2012).

Narrative fantasy or storytelling

A large percentage of digital game players enjoy imaginary and fantasy worlds and imagining that they are a part of the game. They enjoy the unfolding of events in the game and the surprise of the unexpected obstacles that their avatar or player has to overcome. Many games offer intriguing landscapes through which their avatars travel, thus further contributing to being in another world.

Applications

How can HL instructors, like game designers, consciously use the five points of EF described in this paper to increase motivation, engagement and HL student identity? How can we apply the entertainment factor through game architecture, sensory stimulation, challenge,

social interaction, and narrative fantasy storytelling to our lesson plans and practice? In the final part of this paper several types of HL classroom games will be examined according to the five points to see both why they might be enjoyed as they are and how their intrinsic motivational value might be increased.

Game 1 – Bingo

Most HL teachers and students have played at least one BINGO game in their classes. It is an easy game to play and familiar to students. How motivating is BINGO according to the five points of EF?

Game architecture – BINGO's architecture or design is simple which makes teacher preparation time minimal, especially if cards are commercially purchased, and set-up and playing time immediate. Students see the options on their BINGO card, sit passively and await the possibility of their options being called. It can be played in a large group with one member emerging the winner after covering enough spots according to a set pattern – line, cross, picture frame, "X" or full house.

Sensory stimulation - Covering the spot on the BINGO card is a use of sensory stimulation, as is looking at the card and listening to the caller to know which spot to cover.

Challenge - Playing the game with content that is "new" may increase the challenge, but playing with familiar vocabulary, print forms or themes makes the challenge low to non-existent. The emotional driver is trying to beat "chance" and win the game.

Social interaction – Although not interactive, playing BINGO is social in that students compete to win the game.

Narrative fantasy storytelling - A BINGO game does not tell a story or encourage students to engage in any fantasy or imaginary world.

Because of its lack of complexity BINGO can be played with minimal cognitive engagement; students can easily submit to it which is perhaps why it is so popular. Although not high in challenge, BINGO can offer learners a reprieve from demanding parts of a lesson.

Game 2 – Baseball

Baseball is another game style that may be familiar to HL teachers. One version is described in Appendix B.

Game architecture - The architecture or design of Baseball is more complex than BINGO and requires more preparation: questions must be prepared and at different levels. Teachers (or students) have to bring in props to pass around and also the classroom has to be rearranged. Someone has to signal plays in the game by calling "go" and "stop" and someone must keep track of the scoreboard. Points are gained as a result of both ability and chance.

Sensory stimulation – Learners see and hold on to an object that is passed in a circle and pass it on to another player, listen to the teacher calling "go" and "stop", select a card, read it and answer the question on the card or respond to the task described.

Challenge – Challenge can be built into Baseball by having students and the teacher create questions of varying difficulty and making some more difficult questions worth more points or hits. The emotional reward is addressed in the curiousity that learners feel as they wait to hear who will be asked the question they composed.

Social interaction – Asking and answering questions is interactive and competing against other teams in the class is social.

Narrative fantasy storytelling - Baseball does not tell a story or encourage students to engage in any fantasy or imaginary world.

Game 3 – TV Game shows

The primary motivator in TV game shows is winning a highly valued prize. For students in class the imitation of such " high status" games in the classroom can be motivating, as can the increased complexity of most of the more recently created games.

Game architecture – The game architecture of TV game shows typically includes a "Set" of questions. Each "Set" might consist of four (or more) different topics which we shall call "themes" (e.g. school, numbers, home and body parts). Each theme consists of four levels of

questions. See Figure 1. Level one questions are easier than level two questions and so on; in turn, the higher the level of questions, the greater number of points they are worth (a point scale). The game mechanics or rules direct how players proceed from level to level: either by answering all questions in one level before proceeding to the next, or by choosing questions at any level, or perhaps by offering bonus points when a level or theme is completed, or perhaps by concealing a bonus value behind a random question. Time limits, being able to seek help, or not, and defending a win add tension to the game.

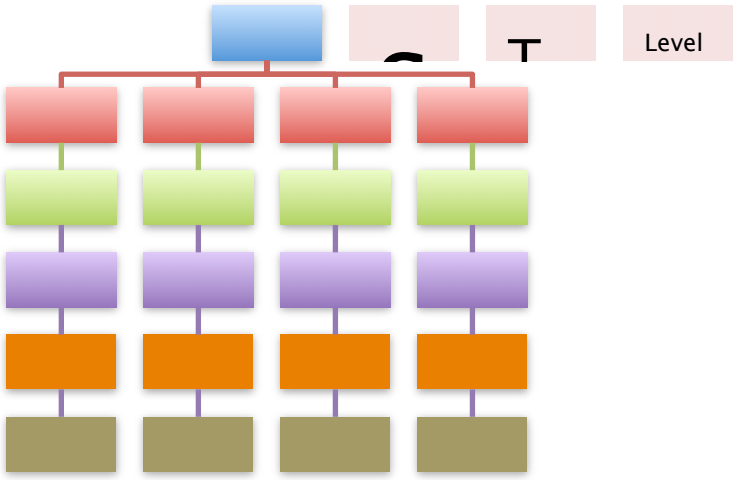
Sensory stimulation – Learners can enjoy sensations with real or improvised wheels, time-sensitive buttons, sound effects, and audio and visual questions.

Challenge – Multiple themes and levels as well as user choice increase the complexity and challenge of the game. Having students and the teacher create the varied questions (which can change from unit to unit) can further increase interest and challenge. The emotional component is addressed in the novelty of playing a game given high status through popular media.

Social interaction – Asking and answering questions is interactive and competing against other teams in the class is social. Making it possible to collaborate with other team members before answering the question can add relationship building potential.

Narrative fantasy storytelling – TV game shows do not tell a story but may encourage students to engage in the fantasy of being on TV.

Figure 1 – Basic Architecture of Game: Set, themes and levels



Game 4 - Story-game

Because the narrative or fantasy component is absent from so many language games or activities commonly played in HL classrooms, I have developed a way to both tell stories in language classes and integrate games like those described above. I call these story-games and use them in many of my demonstration lessons in Japan. They take more time to prepare and fit in well at the end of a unit or term as a review. In a story-game, the teacher narrates a story and students complete tasks to keep the story being told, all in the HL of course. Teachers can adapt the language level of the story to that of the students (e.g. by giving more detail or just the basic facts). The following story-game can be played with the whole class or with groups of students or teams in the class. Here is how to make a story-game.

1. Select a character, context and problem or challenge e.g. Help Alice make it home

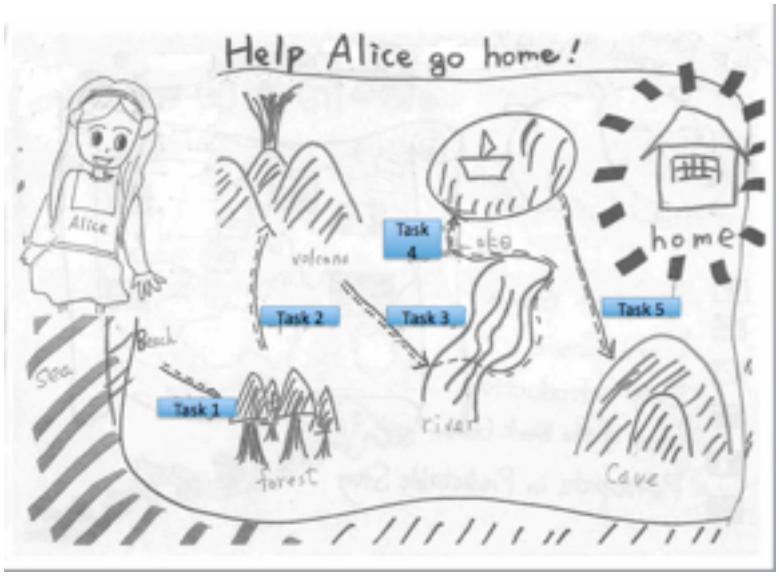
2. Create some obstacles that Alice must overcome to make it home. E.g. crossing a river, avoiding a volcanic region, rowing across a lake, walking through a dark forest… See Figure 2.

Figure 2: Identify obstacles that the avatar must overcome

3. Develop tasks that must be accomplished to overcome an obstacle and help the avatar (Alice) continue to move forward. The tasks should become increasingly more difficult. E.g. Task 1 – find a partner and take a bag of flashcards and pictures. Word cards are printed in one

colour and pictures in another colour. Partner A holds up a word card while Partner B finds the matching picture; Partner B selects and holds up a word card while Partner A finds the matching picture. When completed put the word and picture cards back in the bag and return them to the teacher; Task 2 – find a partner and take a bag of alphabet/characters. Put letters or characters in order (or chart form) and write one word that begins with or contains 7 of the letters/characters. When completed put the word and picture cards back in the bag and return them to the teacher; Task 3 – Select a survey card and ask five peers a question to complete the survey (See Appendix D for an example). When completed give the competed survey to the teacher; Task 4 – from memory and without writing anything down, give a self introduction to a peer by telling seven things about yourself in full sentences. When completed sit down.; Task 5 - read a short story in a group and answer three questions. When completed bring the story and sheet of answers to the teacher. See Figure 3.

Figure 3: Identify tasks that need to be accomplished in order to overcome each obstacle



4. Compose a story that logically explains Alice's journey, what has to be done to overcome an obstacle and why. Divide the story into 6 parts, one that precedes each task and one that brings the story to a close. See Figure 4 and Chart 1.

Figure 4: Create a story in six parts

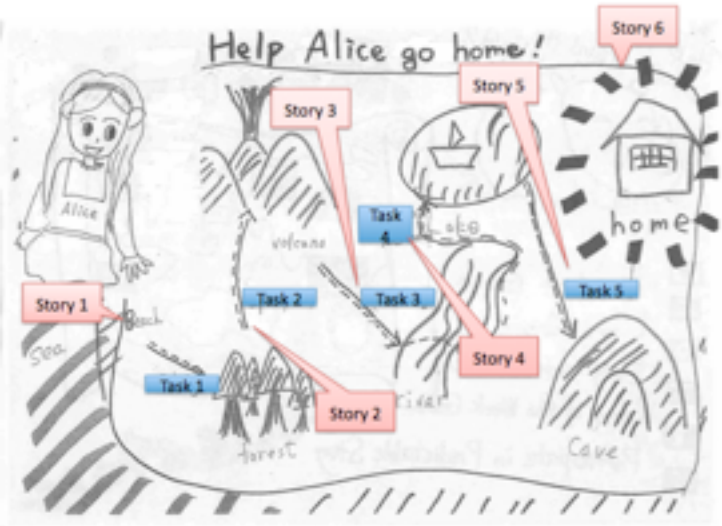


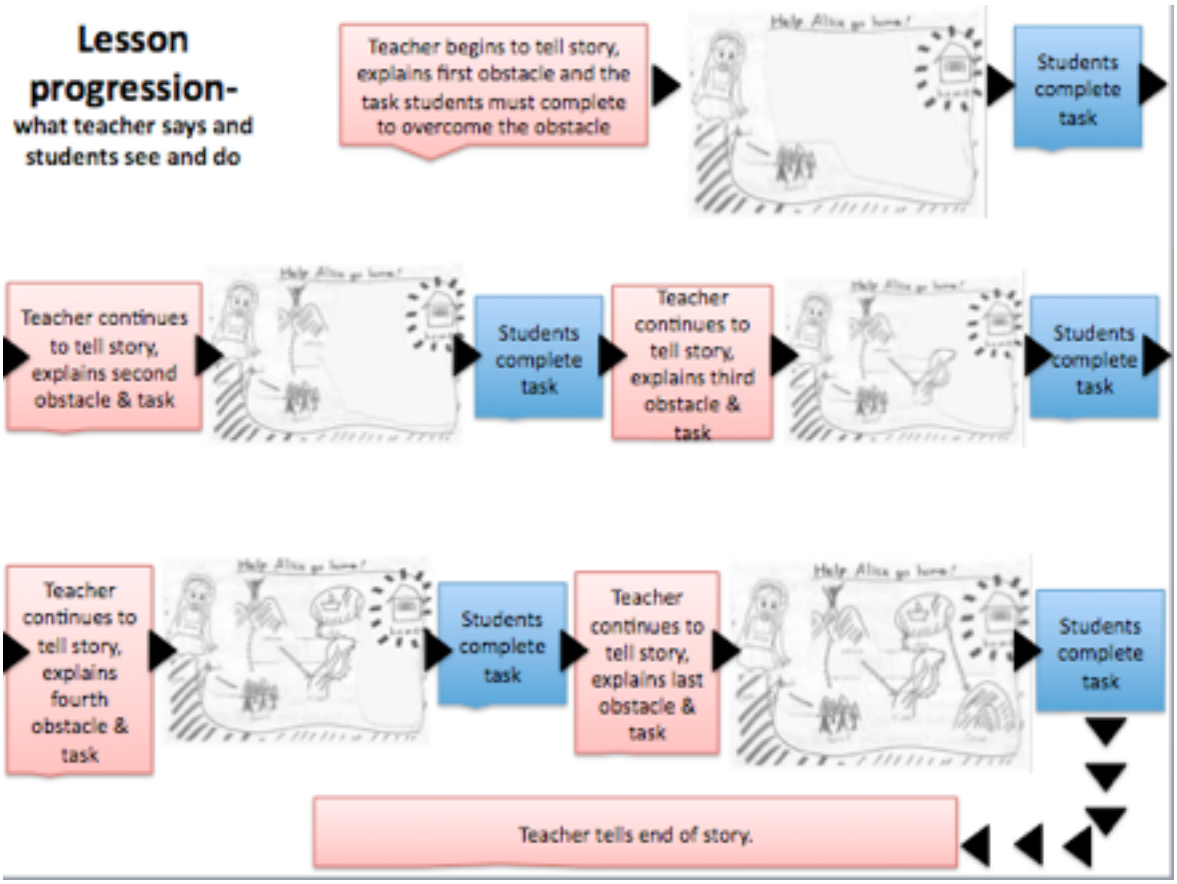
Chart 1: Weaving the story and tasks together

	Task	Alice story line - Weaving the story and tasks together
Task 1	Match flashcards and picture	Alice went for a walk and got lost. Alice wandered for many hours. Then she became tired and fell asleep. When she awoke she found herself on a beach. She played in the water, collected shells and smiled at the warm sun. But after awhile she became lonely and wanted to go home. Although Alice was sometimes afraid she kept her mind occupied by thinking about her family and speaking and learning her HL. Help Alice get through the forest by matching word cards and pictures.
Task 2	Alphabet cards and words	Alice thanks you for helping her through the forest. She liked walking in the sunlight where she could see for miles around. However, ahead of her she could hear loud rumblings and ash spouting out from a mountain. She knew that this was a volcano that was beginning to erupt. She began to run in another direction. Suddenly she saw letters on the ground. The letters were the alphabet and words to help guide Alice. Help Alice avoid the volcano by ordering the alphabet and making words that she can read.
Task 3	Complete a survey	Alice thanks you again for helping her. What words did you create to help Alice? (Listen to students' answers and ideas.) As Alice passed the volcano the temperature around her lowered. She was more comfortable and did not have to run anymore. Soon she came to a river and imagined washing herself off, but the river flowed swiftly and she knew that she could not cross by herself. She looked for a way to cross the river – should she build a raft? Look for a boat? Try to swim across? Or hop onto the rocks that were spread out across the river? What do you think? Please complete a survey and help Alice decide.

Task 4	Self introduction	What answers did you find in your survey? How many of you selected building a raft? (record the number on the board.) How many of you selected looking for a boat? (record the number on the board.) How many of you selected swimming across? (record the number on the board.) How many of you selected hopping onto the rocks? (record the number on the board.) Well, your decision to cross the river by __(majority answer)__ was a good one and it worked. Alice safely crossed the river and again thanks you. On the other side of the river she meets different people and follows them on a familiar path. The path leads to a lake and she must walk around it or cross it. She has no money to buy a ticket on a boat to cross the lake and is becoming very hungry. How can she cross the lake and get some food? Maybe she should make some friends? Then she will have to introduce herself to many people. She is shy and not used to using her HL all the time. Please help Alice remember what she could say about herself by giving a self introduction to a peer. She will listen and learn from you.
Task 5	Read a story and answer questions	Well, Alice listened carefully and was able to introduce herself to many people on the path. They were kind and helpful and offered her food. She even laughed with them and told them about her adventure. They were interested and listened carefully. They then advised her how to get home. She had to walk south until she came to a cave. They told her that at the door of the cave she would find a story to read and have to answer three questions. One word in the each answer would tell her how to get home. Please help Alice by reading the story, answering the questions and choosing the key word in each answer to give her advice.
End of the story		What words did you choose to give Alice advice? (Listen to students' ideas and use them to help Alice get home.) Great job! Alice is home with her family and very happy.

5. Prepare a large sheet of visuals with the game on it, but only reveal the visual pieces as the story unfolds. This will create an element of 'surprise'. Thus the game will proceed as in Figure

Figure 5: Lesson progression in a story-game



With primary and elementary aged students, I have drawn on familiar characters, places and challenges like "helping Alice"; with secondary school students I have integrated more world knowledge and literacy into the narrative of the game. For example, creating a character who has to travel around the world to collect things to help a sick person get well.

Tweaking what you already do to increase the EF

Many HL teachers play a variety of games in their classrooms – BINGO, baseball, variations of well known TV game shows or board games. Such games may be tweaked for increased motivation by drawing upon the EF discussed in this paper. Here are five examples.

1. Integrate songs, video clips, audio clips or sound effects into the game. For example, use inexpensive party favours such as whistles or gazoos to indicate correct answers and

different sounds for incorrect ones. Students may groan about them, but will also never forget them, or you!

2. Follow levels of Bloom's taxonomy (Bloom, 1956) to create simple to more complex questions and tasks for the game and create an even more challenging bonus question.

3. Develop a complex and sophisticated point system. For example, if there are four *difficulty levels* for each theme level one questions might offer 10 points for a correct answer without assistance and 7 points for a correct answer with a request for a prompt. Level two points might be distributed as 20 and 14 respectively; level three as 50 and 30 and level four as 100 and 70. When all questions in one level of one theme have been answered, a bonus question worth 50 points might also be awarded. Further, a minimum number of points might need to be accrued before a question from a new level can be selected. Thus, users might be required to earn 40 points from Level one before choosing a question from any other level.

4. Create a narrative or story to weave the moves of the game together to increase student interest. Thus, move the game of 'baseball' from a sport that earns points to an adventure that requires obstacles to be overcome in order for the game to continue.

5. Integrate personal pictures or memorabilia into the games by telling a personal story about how your family came to Canada or sharing photos about trips to places where the HL is spoken.

Closing

Game designers like LeBlanc and Lazzaro understand engagement and sustained fun. They have employed multiple techniques to entice people to not only play their games, but to continue to play the game for an extended period of time. Their strategies can be beneficial to educators who confront varied levels of student engagement on a regular basis, including those in HL classes. Applying the motivational strategies of edutainment can help us tweak or create new powerful and effective learning tools for more fruitful experiences for students. While teachers may not have the resources to program a computer game, they can apply their creativity

to adapt the narrative of a game when constructing a lesson or unit plan. Although educators avoid terms like *fun*, as Alfred Mercier stated: “what we learn with pleasure we never forget.”

References

Bilash, O., Cheng, I., Wong, V., Basu, A & Bischof, W. (2012). Foreign Language Learning on Mobile Devices: Implications for Alberta’s Teachers. *Notos* 12 (2), 25-40.

Bloom, B. (ed.) (1956) *Taxonomy of Educational Objectives, the classification of educational goals – Handbook I: Cognitive Domain* New York: McKay.

Bomia, L., Beluzo, L., Demeester, D., Elander, K., Johnson, M., & Sheldon, B. (1997). *The impact of teaching strategies on intrinsic motivation.* Champaign, IL: ERIC Clearinghouse on Elementary and Early Childhood Education.

Cheng, I., Bilash, O., Basu, A & Bischof, W. (2012). Next Generation Handheld Graphics Edutainment for Learning in an Adaptive Student Centric Environment, *Eurographics* Education Track, Cagliari, Sardinia, May 2012.

Ivanov, C. (2005 йил 8-November). *Two Fanatic World of Warcraft Gamers Have Died Because of WoW*. Retrieved 2011 йил 20-June from Softpedia: http://news.softpedia.com/news/Two-Fanatic-World-of-Warctaft-Gamers-Have-Died-Becouse-Of-WoW-11821.shtml

Nunan. D. (2004). *Task-based language teaching*. Cambridge: Cambridge University Press.

Schell, J. (2008). *The art of game design: a book of lenses.* Burlington: Morgan Kaufmann Publishers.

Shaules, J. (2007). *Deep Culture: The Hidden Challenges of Global Living*. Multilingual Matters Ltd: Clevedon/Buffalo/Toronto.

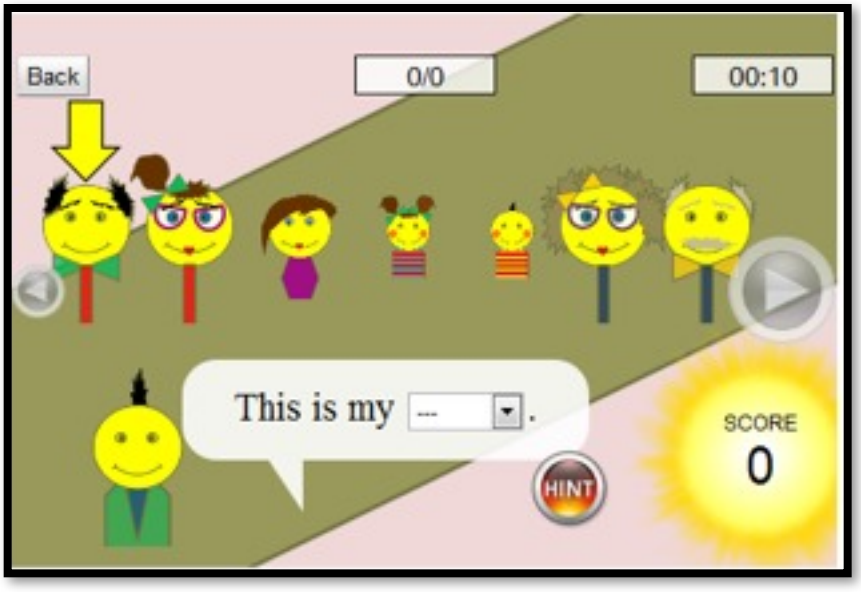
Van Riper, A. B. (2011). *Learning from Mickey, Donald and Walt: Essays on Disney's Edutainment Films.* Jefferson, North Carolina: McFarlane and Company.

White, R. (2003). *That’s edutainment.* Retrieved May 15, 2012 from: http://www.whitehutchinson.com/leisure/articles/edutainment.shtml

Appendix A: LeBlanc's Taxonomy of Game Pleasures

Type of Fun	a.k.a.	purpose
Sensation	Game as sense-pleasure	anything involving the joy of experiencing with the senses.
Fantasy	Game as make-believe	the pleasure of imaginary worlds, and imagining yourself as part of it.
Narrative	Game as unfolding story	the pleasure of experiencing the unfolding of events.
Challenge	Game as obstacle course	the pleasure of solving problems in a game.
Fellowship	Game as social framework	Developing Friendship, cooperation, community
Discovery	Game as uncharted territory	Seeking and finding something new
Expression	Game as soap box	Expressing yourself and creating things (games that let you design characters, etc).
Submission	Game as mindless pastime	Allowing yourself to be swept up in the rules and experiences of the game.

Appendix B: Sample characters developed by Victor Wong



Appendix C – Baseball

1. Students create questions on a given topic and put each question on a separate card.
2. Cards of questions are gathered into two piles.
3. Students sit in two circles – Team A and Team B. In the centre of each circle or team is a table. Half of the cards are on one table; the other half on the other.
4. Each team or circle of students receives a picture of a bat and a picture of a ball.
5. When the teacher says "go" or "play ball", students begin passing the bat and ball in their circle. The bat can be passed in one direction and the ball in the other.
6. When the teacher says "stop", students stop passing the cards. The person holding the ball in each circle goes to the table and selects a question. The student (from the opposite team) who is holding the ball will answer the question.
7. If the question is answered correctly, the team that asks the question gets a **hit. I**f the question is answered incorrectly, the team gets a **strike. Three** strikes makes an **out** and 3 **outs** signals the end of the game.
8. The team with the most hits is the winner!

Variation: Some questions might be more difficult and thus worth "two" or "three" hits!