Motivating Learners in Educational Computer Games

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Abstract

The purpose of this study was to identify motivational elements for an online multiplayer educational computer game. Design ethnography with naturalistic interpretations has been used as a research method. After the data analysis by using the constant comparison method of grounded theory, thirteen categories emerged for the kids as the motivational elements to play this game: identity presentation, social interaction, playing, learning, ownership and control, fantasy, immersive context, curiosity, creativity, achievement, rewards, uniqueness, and context of support.

Introduction

Even the most elegantly designed educational software will fail if the learners are not motivated to learn. For this reason, designers of any educational software must try hard to establish a context that learners will find motivating. Motivation is related with learning because learning is an active process which requires conscious and deliberate effort (Bruner, 1960; Wlodkowski, 1986). Even the most skilled learners are unlikely to learn if they do not apply some effort. In recent years there has been an extensive effort in building learning environments that provide motivational elements. In particular, some educators are examining the potential of computers and even using principles underlying the design of video games to establish rich learning contexts (Barab, Thomas, Dodge, Carteaux, & Tuzun, in press; Malone, 1980; Lepper & Malone, 1987).

Theoretical Background

The framework for motivation in educational games has been largely provided by Lepper and Malone's (1987) work (Tzeng, 2001). They developed a taxonomy of intrinsic motivations for learning, based on four factors as motivating to the learner: challenge, curiosity, control, and fantasy.

While informative for the design of educational contexts, Lepper and Malone (1987) examined video games for entertainment. There has been relatively little research that examines the use of gaming context as providing an educational context for supporting learning. Additionally, as Weiner (1990) points out, motivation should not be limited with 'the self.' Since learning is a shared activity and since it does not take place in a vacuum, new motivation theories should incorporate new constructs like 'belongingness' and 'cooperative learning.' This study will research the motivations of users interacting with a learning and teaching project, Quest Atlantis (QA) that uses a 3D multi-user environment to immerse children in educational activities.

Study Background

Quest Atlantis Description

Quest Atlantis is an educational computer game that immerses children in a virtual environment for completing educational activities. A detailed description of this game was articulated elsewhere (Barab et al., in press). Below, a brief introduction is provided to familiarize the reader to the study background.

The purpose of Quest Atlantis game is to save mythical Atlantis from an incoming disaster. According to the back story of the game, as the Questers complete the educational activities called 'Quests', they help with saving the Atlantis from this disaster. Quest Atlantis has foundations on three bases: education, entertainment, and social commitments.

However, instead of conceptualizing Quest Atlantis just as simply a computer software, it might better be described as a virtual environment designed to support an online community as well as multiple face-to-face communities. The Quest Atlantis storyline, its virtual worlds, and policies make up the Quest Atlantis meta-game, a term used in the commercial gaming sector. The Quest Atlantis meta-game contains the following key components:

- A mythological legend that provides a back story for Quest Atlantis activities
- A number of 3D worlds and villages through which Questers, mentors, and the Quest Atlantis council members can interact with each other
- A Personal Digital Assistant (PDA, a kind of homepage) for each Quester, serving as a portfolio of their learning and participation
- An advancement system centered on pedagogically valid activities that encourage academic learning, entertainment, and social commitments
- Extrinsic rewards structure

Quest Atlantis combines play, role playing, adventure, and learning, allowing learners to immerse into virtual 3D worlds where they select or they are assigned developmentally-appropriate Quests, talk with other Questers and mentors, and build virtual persona (Turkle, 1995; Bers, 2001). Quest Atlantis is implemented in different contexts, including schools as part of the curriculum through QA unit plans, and after-school programs as a volunteer activity (i.e., Boys and Girls Clubs of America).

Quest Atlantis has many components that can be categorized under different major groups: for example, communication, collaboration, and ownership. Within the game the modes of communication are chatting in the 3D space, the internal e-mail system, telegramming, and other discourse within the physical space through various means (i.e., talking within the computer lab, or Questers' talking through phone). The modes of collaboration are co-questing, being part of a guild, requesting help from others, and helping others related with different QA tasks. The modes of ownership are having a personal PDA with various elements on it (emoticons, awards, etc.), X-points that Questers accrue after successfully completing Quests, having a unique avatar through customization, renting virtual land and building on it, artifacts created as the result of the Quests, and merchandise (QA trading cards, QA rulers, QA pencils, etc.) that can be purchased from Quest Atlantis trading post in exchange of the X-points.

Methodology

This study employs qualitative research paradigm. In this sense, the framework of this study can be characterized with multiple labels. It can be characterized as an ethnographic research since its purpose is to describe a group (Fetterman, 1998). For example, I spent considerable amount of time among the people at the selected research site. In addition to one year of frequent visits prior to this study, I spent two months at the site for data collection. Since "good ethnography requires both emic and etic perspectives" (Fetterman, 1998, p. 22) I tried to capture both the insider's and outsider's perspectives of reality. The study included common elements of ethnographic studies such as field work, participant observation, and interviews.

This study can also be characterized as a naturalistic research study (Lincoln & Guba, 1985), because the data collection took place in a natural setting. Also, there were no variables manipulated to confirm or disconfirm a priori hypothesis.

However, being one of the designers of this educational game complicates my role as a researcher in addition to those challenges traditionally associated with ethnography or naturalistic research (Clifford & Marcus, 1986; Fielding & Fielding, 1986; Silverman, 1993), because I have been more than a participant observer. The philosophy of the Quest Atlantis implementation calls for collaboratively developing a vision for each of the centers, while this vision is researched at the same time it is created. Barab, Thomas, Dodge, Newell, and Squire (2002) refer to this process as 'design ethnography,' which is a design work that involves sustained participation and interaction with a context and a designed product. It is design ethnography that drives the methodology of this study.

Design ethnography draws upon the work of a collection of methods, including ethnographic research and action research. Action research, also called as participatory research (Adelman, 1993), has emerged when positivist paradigms failed in studying human organizations (Susman & Evered, 1978). Susman and Evered (1978) argue that the cyclic process of action research eliminates the limitations of the positivism and deals with practical concerns of the people. Actions are planned in mutual agreement by the researcher and the researched. Action researcher acts as a catalyst, who helps to the researched by handling problems and offering interventions to those problems (Hart & Bond, 1995).

In this sense, the goal of design ethnography can be described as changing or empowering the culture under study (Barab et al., 2002). During the process individuals and local contexts transact in a co-evolving fashion. The researcher wears the hat of a change agent (Rogers, 1995) and his goal is to support a transformational process. While doing so his role is a mixture of "peripheral membership" (Adler & Adler, 1987, p. 36) and "active membership" (Adler & Adler, 1987, p. 50) (i.e., he is both outside the culture and within the culture).

Research Question

The purpose of this study is to identify motivational elements for an online multiplayer educational computer game. The above methodological efforts were guided by the following research question:

> What are the motivational elements of Quest Atlantis, whether intrinsic or extrinsic, in terms of student-defined motivation?

Since motivation is a hypothetical construct (Martin & Briggs, 1986; Good & Brophy, 1997) and differs among academicians we need to define the motivation from the perspective of this study. In this study, motivation is defined as individuals' showing their willingness to initiate and sustain participation in Quest Atlantis activities. Examples of QA activities are completing Quests (engaging curricular tasks), participating in synchronous and asynchronous discussions, joining guilds, and signing up for QA jobs.

Context Selection

I conducted a purposeful sampling for the selection of the context. The following were the two major criteria for identifying the context: (a) Quest Atlantis centers that enrolled in Quest Atlantis program in the same region that I lived in, and (b) Quest Atlantis centers that enrolled in the Quest Atlantis program for at least six months. As a result this study took place in an after-school program located in a Midwestern town. The details of how the Quest Atlantis design and research team collaborated with this center has been articulated elsewhere (Barab et al., 2002).

Participant Selection

The participants of this study were members of a Boys and Girls Club meeting the following criteria: (a) Quest Atlantis players, who have played the game at least five different sessions, and (b) Quest Atlantis players, who have spent at least three hours within the game. With these criteria I wanted to make sure that the Questers have accumulated the prerequisite skills necessary to play the game at a basic level. I conveniently interviewed a total of twenty participants. As it is typical in Midwestern communities, almost all participants were Caucasian Americans. Just one of the participants was African-American. Additionally there were five female and fifteen male participants.

Data Collection Methodology

I used primarily ethnographic methods including interviews, observations in the different areas of the Club with an emphasis in the computer lab, and document analysis. Later, a demographics questionnaire emerged to support the interviews. Table 1 summaries these data collection methodologies.

Table 1. Data Collection Procedure Summary

Methodology	**Sources**	**Procedure**
Interview	Participants	Recorded semi-structured interviews on a digital voice recorder, then transcribed
Demographics Questionnaire	Participants	Interviewees filled in after the interview is completed
Observation	Observed computer lab Observed other areas of the Club	Took notes on scratch paper, recorded with a digital voice recorder and digital camcorder at times
Document Analysis	Materials available at the Club such as annual meeting reports and member information Materials available electronically on the Quest Atlantis servers	Read all materials and document any descriptive statistics related to interviewees

Data Analysis Procedures

Qualitative data analysis is inductive rather than deductive. The researcher starts with the data, and then develops concepts and categories, instead of beginning with theory, predicting a pattern of results, and examining the data to test the deduction. Therefore, instead of starting with a hypothesis, the researcher generates the hypotheses from the data. (Fielding & Fielding, 1986).

I used constant comparison method of grounded theory for data analysis. Grounded theory is a systematic set of methods to collect, code, and analyze data. (Glaser, 1992). Specifically the grounded theory is

> … A general methodology of analysis linked with data collection that uses a systematically applied set of methods to generate an inductive theory about a substantive area (Glaser, 1992, p. 16).

In constant comparison method, the researcher asks the following question while he continually codes, compares, analyzes, and writes memos about the data while analyzing them: "What category or property of a category does this incident indicate?" (Glaser, 1992, p. 19). The categories inductively emerge out of the data rather than being decided prior to the data analysis (Patton, 1987). Possible data sources might include interviews, field observation records, documents, and video tapes (Strauss & Corbin, 1994).

Glaser and Strauss, the inventors of the constant comparison method, originally described four stages to analyze the data through constant comparison method. These stages were (Glaser & Strauss, 1967, p. 105): (1) comparing incidents applicable to each category, (2) integrating categories and their properties, (3) delimiting the theory, and (4) writing the theory. However, in their later work they reorganized these into three stages. These stages are (Glaser, 1992; Strauss & Corbin, 1998): (1) open coding, (2) axial coding, and (3) selective coding. In their later work Glaser and Strauss chose to develop their own versions of the grounded theory and constant comparison method.

The approach I followed using the constant comparison method for my data analysis is neither Glaser's nor Strauss and Corbin's in their pure format. It can be said that I followed an adapted version of the constant comparison method by adopting tactics from both versions. Since Weiner (1990) pointed out to the 'many uncharted areas to incorporate' into motivational theories, I perceived the inductive approach in data analysis as a suitable tool that will enable me to unearth these 'uncharted areas.' Aligned with this idea I hesitated to force data as much as possible, and let the data emerge. For this reason, it can be said that my adaptation of using grounded theory and constant comparative method is closer to that of Glaser's (1978, 1992) in philosophy. Below I describe open coding, axial coding, and selective coding stages of my data analysis.

Open Coding. At this stage, data are broken down into its parts. While doing so, incidents are examined closely, and they are compared for differences and similarities. In this sense data are conceptualized. The purpose of conceptualization is to reduce mountains of data into manageable chunks by abstracting that data. While doing so, the labels might be assigned by the researcher, or the labels might be taken from the words of the participants. This latter case is referred as "in vivo" codes (Glaser, 1978, p. 70).

The open coding of the interview documents were done by three researchers and continued intensively for a whole week period. After the open coding of the interview documents there were 202 codes. Two-weeks of open coding of the observation records added 32 new codes. At the end we obtained a total of 234 codes.

Axial Coding. This is the stage where categories are systematically developed and related to each other along their properties and dimensions. Open and axial coding are not sequential stages. The researcher keeps on coding for properties and dimensions while he develops relationships between categories. When it seems like no new properties or dimensions of a category emerge during the coding, that category is considered saturated. (Strauss & Corbin, 1998).

In this stage we tried to systematically develop the categories based on the codes. Open coding and axial coding were not sequential stages. We moved back and forth between the two stages. Three researchers got together to discuss the codes. Since the open coding was done independent of the research question, the codes were characterizing the data well in general but not respect to the research question of the study. Researchers debated the codes grounded in the data by using their own characterization of the motivation based on salient themes and the research question, and by visiting the current literature on motivation theories. So this debate was a dialectic intersection of the codes grounded in the data, our intuitive responses to the research question, and the current theories of motivation.

At the end we obtained thirteen categories: identity presentation, social interaction, playing, learning, ownership and control, fantasy, immersive context, curiosity, creativity, achievement, rewards, uniqueness, and context of support. Eventually, these thirteen categories were used to answer the research question.

Selective Coding. In selective coding the theory is integrated and refined (Strauss & Corbin, 1998). To this end the emerging story is explained around a core category. All other categories are linked to this core category. The core category accounts for most of the variation in the problem.

In this stage the main purpose was to obtain a core category and link other categories to this core category. A secondary purpose was to link the thirteen categories with each other. These two acts together and the categories grounded in the data helped with asserting my arguments. In this section the data were interpreted in a way that has both 'experience-local meaning' (Geertz, 1973) at the same time having 'experience-distance significance' (Geertz, 1973) to others analyzing motivation in other contexts and conditions. This occurred through ensuring that local interpretations were informed by and respond to previous research and theory, with presentations of the assertions being contextualized in terms of the broader literature. Limited space prohibits providing the outcomes of selective coding in this manuscript.

Trustworthiness

Triangulation has been a common method to provide trustworthiness in qualitative research (Patton, 1980). The term comes from the application of trigonometry to navigation. Locating the precise point of a geographic location requires using two points. The intersection of these two points gives the precise geographic location for the navigators (Bogdan & Biklen, 1998). Denzin (1970) originally advocated the use of multiple methods and multiple sources of data to provide triangulation in a qualitative research study. He later suggested using multiple researchers and multiple theories to improve the triangulation (Denzin, 1978; Merriam, 1998). I followed the first three approaches of triangulation to increase the trustworthiness of this study. I applied multiple methods to collect data: semi-structured interviews, observations, questionnaires, and document analysis. I used multiple sources of data: children using QA, personal observations, membership information in club records, and QA participation information in QA electronic databases and logs. And finally three researchers participated in the constant comparative analysis of data. Since I wanted to discover the 'uncharted areas' in motivation, finding any of them would contradict with the other theories of motivation. For that reason, I did not use other theories for the triangulation of my findings.

Findings

After the data analysis thirteen categories emerged for the kids as the motivational elements to play QA. These categories are identity presentation, social interaction, playing, learning, ownership and control, fantasy, immersive context, curiosity, creativity, achievement, rewards, uniqueness, and context of support. Each of these categories also has sub-categories. Below these categories are explained briefly and quotations are provided to illuminate the categories.

Identity presentation. Kids present their identity through their avatar choices, homepages, and by their usernames. These three elements let them express themselves and show themselves to others. In this way they feel that they are empowered within the game.

Researcher: If you compare [QA] to Cartoon Network, how is it different?
Interviewee: Well, it's more digital than Cartoon Network. You can interact with others across the world on both of 'em BUT it's more like you can see other people. You can see what…the avatar is part of it because it shows you what they like, what they are like.

Researcher: What do you think about your homepage?
Interviewee: Um, it's cool, I guess 'cause people can learn about you.
Researcher: What are the things that you like on your homepage?
Interviewee: Um…how you can say what you like and what you can do.

Social interaction. Social interactions happening in the game was one of the biggest motivators for the players. These interactions happened both within the online space and within the physical space where they connected to the game. While interacting with others they interacted with various people through multiple communication modes. At times there was competition among the Questers but sharing conquered over competition. Although there were Questers who wanted to play the game individually, playing it as a group was more frequent. And security features within the game bettered the social interactions.

> *Researcher: So Quest Atlantis created an opportunity for you to meet [new people]?*
> *Interviewee: I think Quest Atlantis is trying to make you friends. I think that's why the people made Quest Atlantis, so if you were just lonely at the club, you could get friends on Quest Atlantis. That could help you have more fun at the club.*

Playing. To most Questers QA is a game that they can play. They name QA experience as 'playing the QA.' Multiple factors contributed to the gameness of QA. Controlling an avatar was one of them. Another factor was the different worlds and villages that made up the game. They explained that looking for Quests in them was an exciting activity to do. Exploring these worlds and villages and finding out secret places in them were fun things to do for them. They used their points in the trading post to buy store items. The synergy of all these factors made QA a fun game. Most of the interviewees fell in love with QA space, its characters, and its story:

> *Researcher: I know you like Cartoon Network pretty much right? How is [QA] different from Cartoon Network?*
> *Interviewee: Quest Atlantis is a thing that is only one thing, and you are actually a real person and you can talk to people and you don't have to just play a game, or anything. It's a learning thing where you can learn and have fun too at the same time.*

> *Researcher: Why did you join Quest Atlantis?*
> *Interviewee: I just thought it would be fun to play a game that you have to do quest and get points and you can build houses and stuff like that.*

Learning. For Questers, QA is not just a game that they can roam around. This game also has an educational value and they enjoy learning through QA. Most of them emphasized learning in QA was a fun activity. They indicated QA was a place where 'you can learn and have fun too at the same time.'

> *Researcher: How is Quest Atlantis different from other things you do on the computer?*
> *Interviewee: You have fun while you're learning.*

This combination of fun and learning were such tangled that at times they were not aware that they were learning. In this sense they experienced flow (Csikszentmihalyi, 1990) in the learning process:

> *Researcher: How is Quest Atlantis different than other things you do on the computer? For example, I see a lot of kids, including you, play Cartoon Network. How is it different from Cartoon Network or from other educational games?*
> *Interviewee: Well, Quest Atlantis doesn't have that many games than Cartoon Network or any of that. It's different than Cartoon Network and stuff like that because it's got education, and you learn, and sometimes you don't even know that you are learning.*

Ownership and control. The design and development of QA is based on a design model called 'Participatory Design.' In this sense the opinions of the users of the game are constantly evaluated by QA design team and reflected into the game. As the result of this approach, half of the Questers felt as if they were the rulers of the game most of the time. In this sense they treated the game as 'their own game.' The kids were definitely aware that QA was created by some outside people:

Researcher: Can you tell me about your favorite worlds or villages?
Interviewee: I like…Ocean World.
Researcher: What is the reason for that?
Interviewee: Uh…I just really like the ocean and it's cool that Quest Atlantis has got it where you can go down in the ocean and talk to people. 'Cause no other games would like, consider the ocean. And you guys, like, make us swim down there and stuff.

However, this creation by the outside people was in the form of implementing it. Actually most of these implementation ideas came from the Questers themselves. For example, when one of the Questers got a pack of trading cards I asked if he liked them. He pointed specific clutters on one of the cards and told me 'I designed these.' He was referring to the previous site visits by the game designers, who collected ideas from the kids related with card design. Therefore, he was implying to me that he liked the cards since he had a saying on their design.

Fantasy. The fantasy elements the Questers like about QA include the QA myth and the QA council. At least half of the interviewees mentioned these two elements specifically.

Researcher: Can you explain more about why you complete quests?
Interviewee: Two things: I want to help the Atlantians, plus points.

Researcher: So, you like questing, you like the council…and what else can you tell me?
Interviewee: Yeah. Um also, when I make a mistake, I always like that because I like to read the letters that the council sends me if I made a mistake on my quest. I like to read those a lot.

Immersive context. Although most of the action takes place on a computer screen, the QA experience utilizes other support structures, which elevates the game play and makes this experience an immersive one. These support structures at the club included QA posters, QA activity chart, QA trading cards, and QA comic books. 3D part provided most of the immersivenes on the screen.

Researcher: How is it different from other things in the computer lab?
Interviewee: It's different 'cause it's more interactive. It's more digital. You can, like, walk around in a digital space.

Researcher: Why do you think [QA] is fun to play?
Interviewee: Because, like, you get to do stuff, something like that, you don't get to do other things in there. It is like you are inside the computer. Because like that.
Researcher: How is Quest Atlantis different than other games in the lab?
Interviewee: It is different, because you get like, it feels like you are inside of it…

Curiosity. There were several aspects within the game that made the Questers curious. These aspects increased their interest towards the game, and they wanted to come back to the game more often. These aspects were the end of the game, Quest response statuses, and secret places.

Researcher: Can you tell me those reasons [that make you come back to QA]?
Interviewee: I like the building stuff and also…I like doing quests and I just…last week I didn't even get to come to the club the whole week, so I was dreaming about going back to the club and seeing if the council has, um, accepted my quests yet, and they did. I was so happy about that.

Researcher: What makes Healthy World special?
Interviewee: Healthy World…it's got a lot of secret places. That's what I like about a world.

Creativity. Questers said that they like 'creating stuff.' They like to be creative and they like to convert their ideas into reality. They all indicated again and again that the way to do this in QA was through building activities. In the virtual space they can build virtual structures, furnish them with different objects like pictures, and therefore impact the QA space. For one of the Questers, building became such an obsession that he kept working non-stop for three days to build his first virtual building. One Quester, who was observed to be obsessed with building, explained that QA let her to be creative:

Researcher: Why do you like building so much?
Interviewee: Because it's fun to like, make houses, be creative and make up a whole bunch of ideas and look at other people's houses too.

Eight out of twenty Questers chose building as one of their three most favorite activities in QA. In addition one fourth of the interviewees indicated that building was one of their reasons to come back to play QA.

Achievement. While the Questers participate in different QA activities including doing Quests, building activities, finding secret places, and similar activities most of them perceive these activities as a challenge. They try to overcome these challenges. When they succeed their accomplishment is recognized by the game by different modes. Eventually they get satisfaction out of this overall process.

Researcher: You said you complete the quests for points, right? Is there another reason for completing quests?
Interviewee: To, uh, get land and just to have fun.
Researcher: What kind of fun are you having, because you already told me that some of the quests are hard to do and take a lot of time to type… So, what kind of fun are you having?
Interviewee: It's fun, like, the challenge to get it done just so I can get the points…it's just a challenge to get 'em. That's really my reason.

Researcher: What is the most exciting thing you have done in Quest Atlantis?
Interviewee: Like, whenever I go the idea that I could make a party room, and everyone started coming to my house and looking at it. And it really made me feel good.

Rewards. There were two kinds of rewards that they recognized: awards on their homepages and material items. Material items included trading cards and other items that they could buy with their points. All kids indicated that they liked having the ownership of these rewards.

Researcher: What do Quest Atlantis points mean to you?
Interviewee: The points mean that, uh, if you get enough points you can either get some cards, or if you even get enough and go to this one special place in the trading post, you can get Internet time, a pencil, just basically anything that gets listed there.

Uniqueness. Most Questers play QA because it is 'a game that sticks out from all the others.' It is unique because it creates a unique opportunity to do different things. In this way, it is different from other educational games, other computer software, and other activities in Questers' daily lives.

Researcher: Why did you join Quest Atlantis?
Interviewee: I thought it'd be pretty cool, because most of the Internet games are not learning environments, you know shoot'em all, kill'em kind of games. So yeah, I thought it would be really cool to join something this totally different from that.

Researcher: Is [QA] different from worksheets [at the school], for example?
Interviewee: Worksheets you have to read, and on quests you also have to read. And on the worksheet, you have to write something down. On the computer, you just type it and it's like words. You send it by puttin' it in the inbox. I mean, at school you put it in the inbox. Here you just send it to the council. They'll read it, reply and, uh, give you your points. Like, one out of ten is for a worksheet.
Researcher: If you had a choice at your school. Your teacher came over, let's suppose, and said, 'Okay guys here is Quest Atlantis. Within Quest Atlantis you will complete this quest. And here is a worksheet.' Which one would you choose?
Interviewee: I'd say Quest Atlantis.
Researcher: Quest Atlantis? If there is no difference between them, why Quest Atlantis?
Interviewee: Because you get to change into someone and get to go to other worlds, but you can't go here; you can, uh, see the sites that have been provided for you; you can lift things, as in

Healthy World you can lift a bike; you can see a big basketball; you can see other people's houses, what they've built; you can see pictures; you can build a house.
Researcher: With the worksheets you couldn't have those?
Interviewee: It's not really that much fun with a worksheet. Unless you have to like, change the worksheet into an airplane, then a paper ball, and then throw it into the trashcan!

Context of support. Since QA was implemented in multiple contexts, including after-school environments and schools, it is noteworthy to point to the contextual implementation differences. Three of the interviewees also played the game in their schools and they all pointed to the differences in these implementations, which made the game play experience different. For example, at some schools they were not able to choose their usernames, but a username was assigned by a teacher. Another contextual difference was the variation of the trading post items for different schools.

Discussion

This study has found thirteen categories as a reason for the kids to play an educational computer game: identity presentation, social interaction, playing, learning, ownership and control, fantasy, immersive context, curiosity, creativity, achievement, rewards, uniqueness, and context of support.

When these categories are linked to make a sound interpretation towards a theory of motivation, three important constructs emerge: who participates, what activity is done, and what outcome is obtained.

Identity presentation and social interaction categories belong to 'who participates' construct. In this sense an individual likes to be part of a culture or social structure, however the individual still would like to keep his identity through various means. Therefore, an individual can participate in activities alone or he can participate with others.

Playing and learning categories belong to 'what activity is done' construct. For any activity, there were varying opinions on the type of that activity. For example, some kids characterized completing Quests as learning while some other kids characterized the same activity as playing. After the analysis, it was clear that most of the kids did not mind learning through this educational game although it was a volunteer activity at the after-school context. The intermingling of playing and learning contributed to this positive attitude. Based on this, it can be suggested that play is an important element for individuals and it should be mixed with learning or working to motivate them towards sustaining and completing these activities.

Achievement and rewards categories belong to 'what outcome is obtained' construct. Most of the kids liked having the rewards after they overcame the challenges. However there was still a minority enjoying the satisfaction out of challenges and refusing any extrinsic rewards.

Integrating these categories into a framework of motivation was in progress as of writing this manuscript.

Conclusion

This manuscript is part of a dissertation study. At the time of writing this manuscript, the writing of the dissertation was in progress. Limited space prohibits providing all the details of the study. Interested reader can find more information on this manuscript by looking into the same title under Dissertation Abstracts International (DAI), or by searching author's name under databases that index major publications in Social Sciences (when they become available). The author can be contacted through htuzun@indiana.edu or hakantzn@yahoo.com.

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