

# **Quest Atlantis: A Computer Game That Transcends the Computer**

Hakan Tuzun  
Indiana University, Bloomington

## **Introduction**

The place of technology in education and schools has been a hot topic of debate for a long time (Mayer, Schustack, & Blanton, 1999). During the 60s and 70s the focus was on programmed-instruction, which included methods like drill and practice. During the 80s the focus shifted to computer programming by using programming languages like Basic and Logo. In the 90s the focus changed to learning to use various computer software including office applications and computer games.

Games and simulations have been played for enjoyment for thousand of years. However, their use in education and training is a recent development. Games involving the use of maps were first used in military training as early as 1798 (Langton, Addinall, Ellington, & Percival, 1980). After following their commercial success in the 80s and 90s, computer games were recognized as a learning tool by educators to improve learning.

According to Garris, Ahlers, and Driskell (2002) there are several reasons for using computer games for education and training purposes. These are:

- The learning approach is shifting from traditional didactic model of instruction to a learner-centered approach, which emphasizes a more active learner role
- There are some studies in the literature showing that games can be effective tools for supplementing teaching and teaching complex subject matter
- The intensity of engagement that computer games can invoke in learners

Related to this last notion, implicit in the research literature is the notion that when certain game features are paired with instructional content, the power of games can be exploited to engage and motivate learners towards learning (Garris, Ahlers, & Driskell, 2002).

## **3-Dimensional Virtual Worlds**

Just like the 60s, the 70s, the 80s, and the 90s were the eras for trying out different technologies for learning, it looks like the beginning of the new millennium will be an era where 3-D virtual worlds are used in the context of learning. The research on the potential of 3-D virtual worlds for communication and social interaction has been conducted since this technology emerged. A key finding from the beginning has been the need for interdisciplinary collaboration between the technologists building these worlds and the experts specializing in different disciplines like education (Damer, Kekenes, & Hoffman, 1996).

3-D Virtual worlds can combine text and voice communication capabilities with the ability to explore realistic virtual worlds. 3-D virtual worlds' history goes back to the text-based multi-user games such as Space War that was a popular application within the UNIX operating system. The development of Usenet newsgroups, listservs, Multi-User Dungeons (MUDs), Object-Oriented Muds (MOOs), and Internet Relay Chat (IRC) helped with the development of 3-D virtual worlds.

3-D virtual worlds usually have the following characteristics:

- They provide high quality 3-D graphics and high quality audio
- They are represented on a 2-Dimensional computer screen
- The time in the 3-D virtual worlds is real
- They are Multi-User Virtual Environments (MUVES)
- People are represented by avatars
- The users in the 3-D virtual worlds can move freely in all directions
- The users can interact with other users, bots (automated computer software), and objects
- They have object-based construction that requires no programming

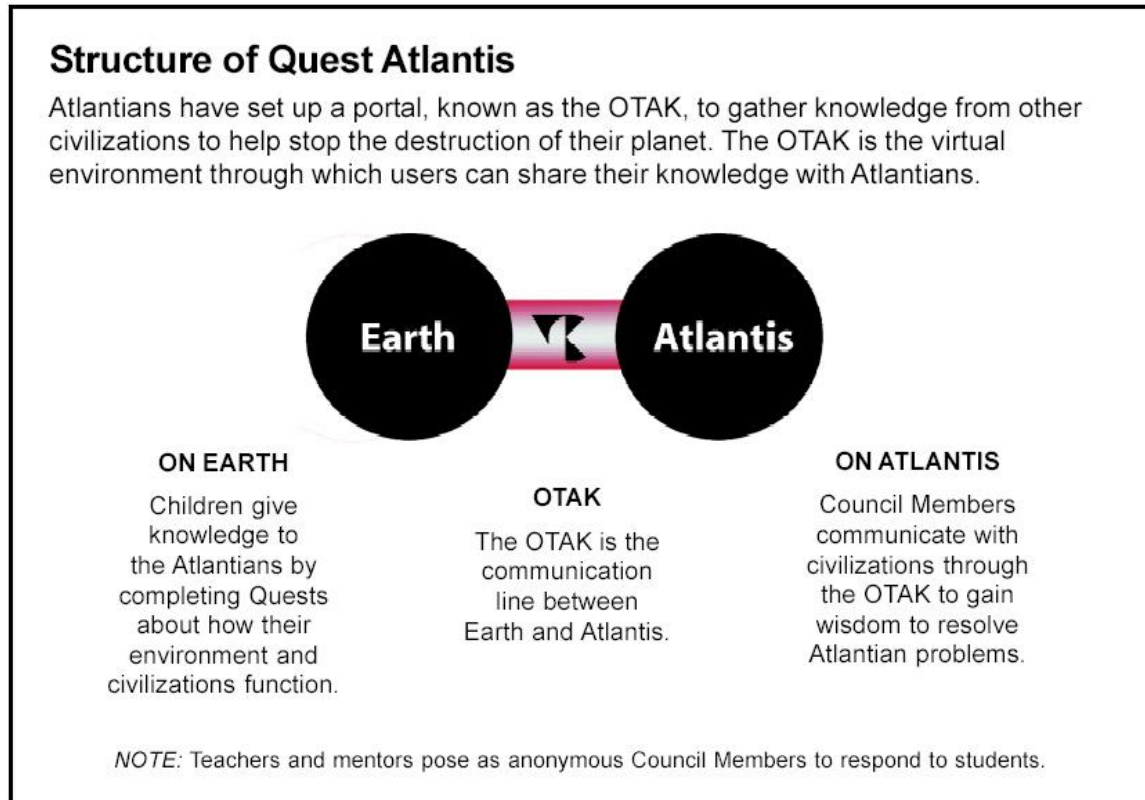
3-D virtual worlds can be used to meet and interact with other users, and build virtual buildings. Some of the current 3-D virtual worlds on the Internet include Active Worlds (<http://www.activeworlds.com>), Blaxxun's online community ([www.blaxxun.com](http://www.blaxxun.com)), Worlds Chat (<http://www.worlds.net>), and Outer Worlds (<http://www.outerworlds.com>).

With the sudden increase of the 3-D virtual worlds, people have used them for different purposes, such as creating art, making tours, shopping, visualizing scientific data, collaborating, dating, commercial purposes, and etc. People from the educational areas also experimented with 3-D virtual worlds to use them for educational purposes. For example, in response to the growing demand from educators, Active Worlds Corporation launched the Active Worlds Educational Universe (AWEDU), which is a unique 3-D virtual world that makes this kind of technology available to educational institutions, teachers, and students. Via this community, educators are able to explore new concepts, learning theories, and creative curriculum design, and discover new paradigms in social learning. The same tasks can also be accomplished in other 3-D virtual worlds.

### **Quest Atlantis**

Quest Atlantis (QA, <http://www.QuestAtlantis.org>) is an educational computer game that immerses children in a 3-D virtual environment for completing educational activities. The purpose of the game is to save mythical Atlantis from an impending disaster (Barab, Thomas, Dodge, Carteaux, & Tuzun, in press). According to the back story of the game, as the learners complete the educational activities called "Quests," they help with saving Atlantis from this disaster (Figure 1).

Figure 1. Structure of Quest Atlantis.



However, instead of conceptualizing Quest Atlantis as simply a computer software, or a computer “game,” it would be better 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 to refer to Massively Multi-Player Online Role-Playing Games (MMORPG) in the commercial gaming sector. Examples of MMORPGs include Asheron’s Call or Dark Age of Camelot. The Quest Atlantis meta-game contains the following key components:

- A mythological legend that provides a back story for Quest Atlantis activities (The legend animation can be accessed at <http://atlantis.crlt.indiana.edu/legend/legend.wmv>)
- A number of 3-D worlds and villages through which learners, mentors, and the Quest Atlantis council members can interact with each other (Figure 2)
- A Personal Digital Assistant (PDA) for each learner, serving as a portfolio of their learning and participation (Figure 3)
- An advancement system centered on pedagogically valid activities that encourage academic learning, entertainment, and social commitments
- Extrinsic rewards structure
- A globally-distributed community of participants

Figure 2. OTAK Interface. A Screenshot from Quest Atlantis, showing a scene from a village on the left and the homepage for a student on the right.

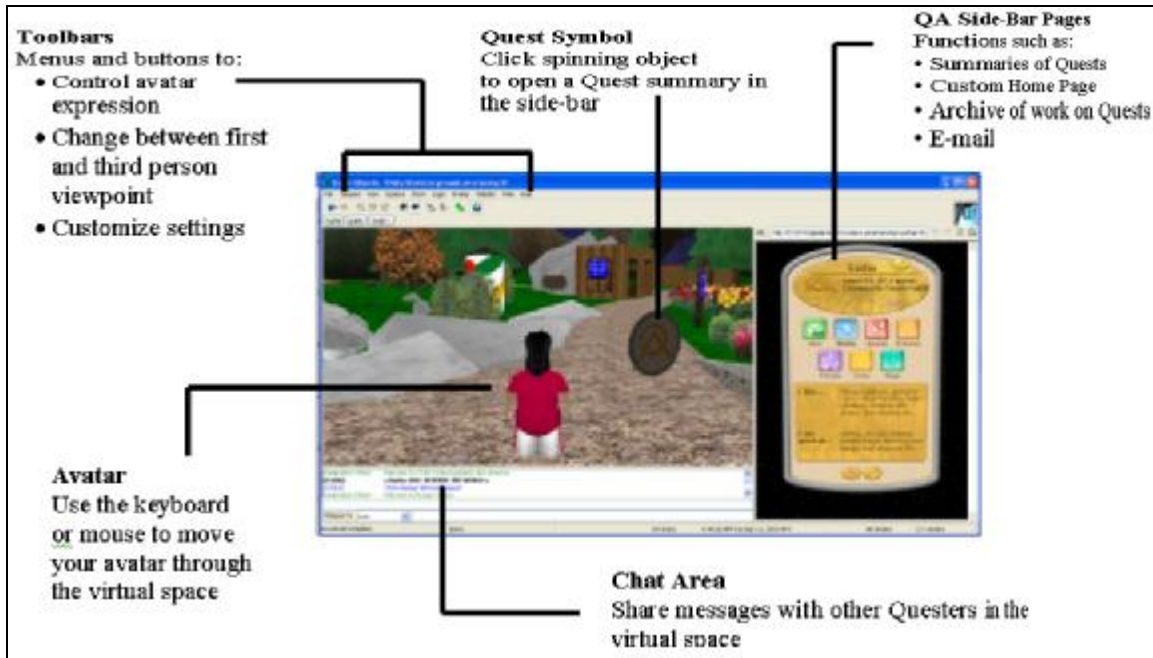
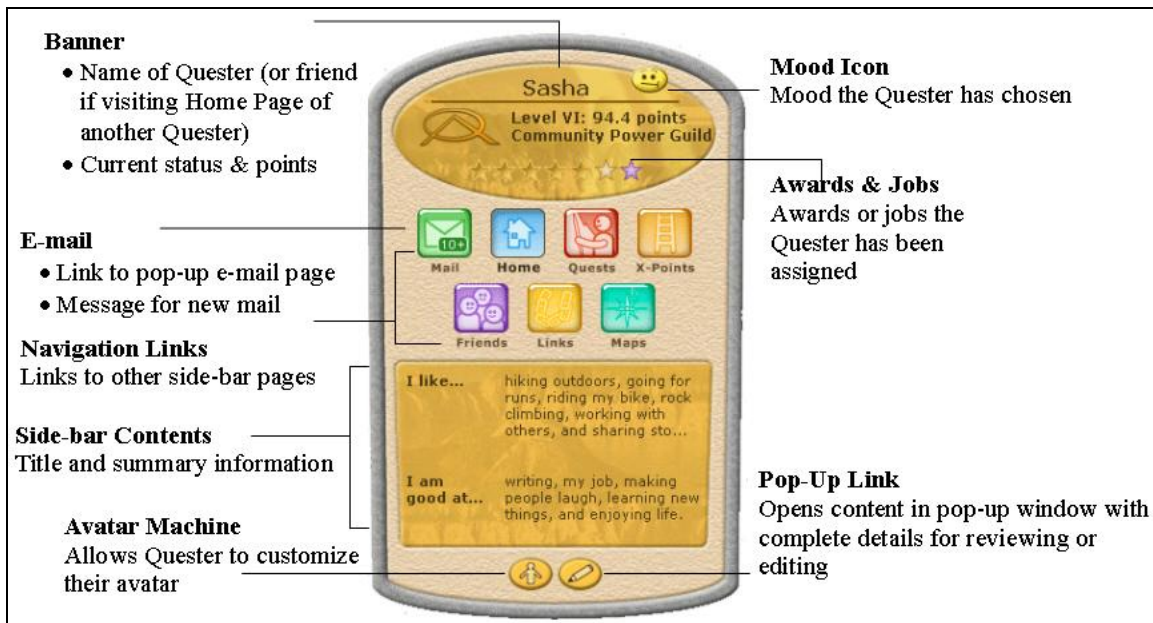


Figure 3. The OTAK side-bar.



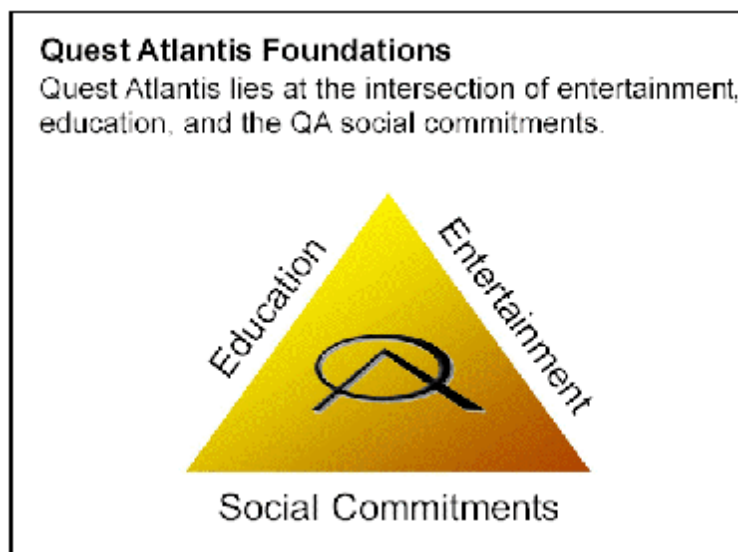
Quest Atlantis combines play, role playing, adventure, and learning, allowing learners to immerse themselves into virtual 3-D worlds where they select or are assigned developmentally-appropriate Quests, talk with other learners and mentors, and build virtual personas (Turkle, 1995; Bers, 2001). Quest 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 channels of communication are chatting in the 3D space, the internal e-mail system, telegraphing, and other discourse within the physical space through various means (i.e., talking within the computer lab, or learners talking over the phone). The methods of collaboration are co-questing, being part of a guild, requesting help from others, and helping others related to different QA tasks. The modes of ownership are having a personal PDA with various elements on it (emoticons, awards, etc.), X-points that learners accrue after successfully completing Quests, having a unique representation, called an 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 the Quest Atlantis trading post in exchange for the X-points (Tuzun, in press).

Quest Atlantis lies at the intersection of education, entertainment, and social commitments (Figure 4). Our QA team have worked to understand how to develop a “computer game that transcends the computer,” that includes inquiry-based and experiential activities that are in alignment with academic standards and that can be assessed for learning gains, that provides entertainment without violence, a girl-friendly environment that still is attractive to boys, and that is committed to making the world a better place (Barab, Thomas, Dodge, Carteaux, & Tuzun, in press).

Figure 4. Quest Atlantis Foundations.



## **Education Foundation**

In general, it is accepted that learners should be involved in doing domain-related activities, not simply receiving the results of others' activities as summarized in texts (Bransford, Brown, & Cocking, 2002). Underlying the development of QA learning tasks, QA unit plans, and the experience of QA more generally is a participatory framework that stresses action and reflection as central components to the learning process. This notion of an active learner engaged in real-world activities is central to the learner-centered, experientially-focused, and inquiry-based learning environments being advocated in the literature and is consistent with current frameworks and plans for educational reform. Central to our interpretation and application of a participatory framework to QA is our belief that there is a close and necessary relationship between actual experience and education. As such, our work is grounded in three schools of thought on learning: experiential learning, inquiry-based learning, and portfolio assessment (Barab, Thomas, Dodge, Carteaux, & Tuzun, in press).

**Experiential Learning:** There have been numerous scholars and learning theorists who advocate for the core characteristics of experiential learning: the belief that learning involves real-world participation, the belief in the intimate relations between experience and education, the certainty that understandings are derived from and modified through experience, and the conviction that action and reflection are necessary features to meaningful learning (Tuzun, 2004). However, not all experiences are equally educational. Experiential learning that involves meaningless action neither liberates the learner nor changes society. In QA, we stress the need for both action (hands-on experience) and reflection (minds-on experience), with a focus on inquiry-based activities that support the learner in generating information, in evaluating its relevance to solve problems, in constructing meanings in authentic settings, and in justifying the credibility of assertions. While QA activities recognize the necessity of experience, they are grounded in educational standards and international benchmarks and are at the same time they are connected to our guiding social commitments (Barab, Thomas, Dodge, Carteaux, & Tuzun, in press).

**Inquiry-Based Learning:** Inquiry requires students to actively participate in the learning process. It is frequently collaborative and affected by available tools and local conditions. It involves supporting students in taking ownership over the learning process, and focuses on learning with understanding. Inquiry-based learning leverages students' natural curiosity to make sense of the world. While engaging in inquiry activities, students refine questions, gather data, evaluate information, develop plausible interpretations, and reflect on their findings with respect to answering both initial and emergent questions. We have developed inquiry-based activities that are grounded in real-world issues and that require the application of principles, methods, and conceptual understandings associated with core disciplines. QA activities are also focused on important social issues and are connected to important educational standards (Barab, Thomas, Dodge, Carteaux, & Tuzun, in press).

Portfolio Assessment: Very often assessment evaluates lower level skills and memory, giving the message to students that these are more important than critical thinking. Further, assessment frequently is treated as an activity that is distinct from the learning process and from authentic participation. Portfolio assessment is one form of assessment that allows educators to examine what students can produce when using authentic tools and resources and confronting real world problems. Portfolio assessment allows educators to validate and encourage real-world activities, with assessment focused on the quality of student work as part of these experiences as well as their reflection on the produced work; thus, supporting hands-on and minds-on learning activities. In QA, each student has his/her own homepage that serves as an online portfolio of their QA activities and contains teacher feedback on these activities (Barab, Thomas, Dodge, Carteaux, & Tuzun, in press).

### **Entertainment Foundation**

To most learners, QA is a game that they can play. They frequently refer to their QA experience as “playing the QA.” Multiple factors contribute to the gameness of QA. Controlling an avatar is one of them. Another factor is the different worlds and villages that make up the OTAK. Learners often state that looking for Quests in them is an exciting activity to do. Exploring these worlds and villages and finding out secret places in them are fun things to do for them. They use their points in the trading post (a virtual store) to buy different QA items. The synergy of all these factors makes QA a fun game. Most of the learners fall in love with QA space, its characters, and its story. For example, one of the learners stated:

“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.”

In the virtual game space learners can build virtual structures, furnish them with different objects like pictures, and therefore impact the QA space. For one of the learners, building became such an obsession that he kept working non-stop for three days to build his first virtual building. There are a number of plots available in an area in QA. The learners can rent one of these plots for two months with their points. At the end of this period, they can keep their land by re-paying the rent. The area they are allowed to build in QA is called “Building Area” (Figure 5). The building area became a part of QA popular culture. Even learners who do not have land go there to see what others have created.

Figure 5. Building Area. A Screenshot from the Building Area in Quest Atlantis, showing the virtual home of a learner.



Another entertainment factor in QA is the virtual council members (Figure 6). Most of the learners personalize the council members as if they are real people. They specifically like the interaction with these council members. In the game design, there are opportunities to interact with the council members. For example, when they complete certain Quests they can e-mail Alim (main game character) for extra points and explain the links between these different Quests. After meeting certain requirements, like completing at least three Quests and filling in their homepage information, they can e-mail Alim to put their names on the OTAK wall. Or, when they break the rules they might be asked to send an apology e-mail to the council.



Figure 6. QA Council Members. The main character of the game is a female (Alim, third from the left). The council members were created with a specific emphasis on diversity.



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 include QA posters, QA activity charts, QA trading cards, QA comic book, and QA novel. Two of the support structures in QA, QA comic book (<http://atlantis.crlt.indiana.edu/centers/comic/index.html>) and QA novel ([http://atlantis.crlt.indiana.edu/centers/QA Novel-web.pdf](http://atlantis.crlt.indiana.edu/centers/QA%20Novel-web.pdf)), present the backstory of the game in alternative forms. This assures the fantasy element of the game will be understood by many learners with different interests and learning styles.

### **Social Commitments Foundation**

While developing Quest Atlantis game our purpose is not just to design a computer game within the computer. We enmesh ourselves in local contexts to collaboratively work with local stakeholders, who will be part of the game. With the help of these stakeholders we co-develop a critique of their culture. Eventually, a series of social commitments are produced with their help based on a shared vision for how their culture might be changed for the good of all involved in the process (Thomas, 2003). More specifically, the commitments provide the base for the development of Quest Atlantis with the aim to support children in developing their own sense of purpose as individuals, as members of their communities, and as knowledgeable citizens of the world. As a result of this, each Quest is linked to a dimension of development in addition to connecting to academic standards (Barab, Thomas, Dodge, Newell, and Squire, in press).

We have developed the following social commitments as part of the Quest Atlantis project. Each QA social commitment has an accompanying descriptive t-shirt slogan associated with it.

- Personal Agency (“I have voice”) - The child should be able to articulate issues that are of concern to her and implement a fair plan to address the issue.
- Diversity Affirmation (“Everyone matters”) - The child should be able to value others while appreciating the shared qualities, differences and viewpoints of others.
- Healthy Communities (“Live, love, grow”) - The child should be able to express feelings of connectedness and show how she is supporting members in building relationships and creating a collective that is larger than one individual.
- Social Responsibility (“We can make a difference”) - The child should develop a sense of altruism, honesty, integrity, empathy, dependability, and a commitment to justice.
- Environmental Awareness (“Think globally, act locally”) - The child should understand and be able to respond locally in her communities to environmental issues that are of global concern.
- Creative Expression (“I express myself”) - The child should be able to find multiple ways in which she can bring forth her personality.
- Compassionate Wisdom (“Be kind”) - The child should act in empathetic ways to all, using her understanding of complex issues to find forgiveness. (Barab, Thomas, Dodge, Goodrich, Carteaux, Tuzun, 2002, p. 16).

## **Conclusion**

Prensky (2002) argues that it is not the use of the Internet, distance learning, computers, wireless devices, computer-based learning, and e-learning that will revolutionize the learning in the 21st century. It is making learning fun and relevant, and therefore discarding the pain and suffering that accompanied it for so long, that will revolutionize it. Prensky (2002) predicts that after spending so much time playing with fun and engaging computer games, learners will demand these types of learning environments, to the point that parents and teachers can no longer resist. In QA we have been experimenting to combine fun and learning together. In this manner, we have worked to balance the triangle of educational goals (providing academic information, “life” knowledge, computer skills, & metacognitive development), entertainment goals (increasing motivation and retention for school & home participation), and social commitment goals (creating framework for discussion and practice of our social commitments) (Dodge, Carteaux, Tuzun, 2003). To this end, we have developed a rich meta-game context through which participation for children has been perceived as meaningful and attractive. 3,800 registered QA members worldwide (from the USA, Australia, Denmark, Singapore, and China), 6,000 undertaken Quests, 670,000 lines of chat, and 50,000 e-mail messages confirm that learners are willing to participate in this kind of meaningful and engaging learning environments. To summarize, QA represents a model of learning in the 21st century.

## **Acknowledgement**

Quest Atlantis was supported in part by a CAREER Grant from the National Science Foundation, REC-9980081 and by the National Science Foundation Grant #0092831.

## References

- Barab, S. A., Thomas, M. K., Dodge, T., Carteaux, B., Tuzun, H., (in press). Making learning fun: Quest Atlantis, a game without guns. To appear in *Educational Technology Research and Development*.
- Barab, S. A., Thomas, M. K., Dodge, T., Goodrich, T., Carteaux, B., & Tuzun, H. (2002). Empowerment design work: Building participant structures that transform. *Proceedings of the Fifth International Conference of the Learning Sciences*. Seattle, Washington October 23-26, 2002, 232-236.
- Barab, S. A., Thomas, M. K., Dodge, T., Newell, M., Squire, K. (in press). Design ethnography: Building a collaborative agenda for change. To appear in *Anthropology Education Quarterly*.
- Bers, M. (2001). Identity construction environments: Developing personal and moral values through the design of a virtual city. *The Journal of the Learning Sciences*, 10(4), 365-415.
- Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds). (2002). *How people learn: Brain, mind, experience, and school*. Washington, D.C.: National Academy Press.
- Damer, B., Kekenes, C., & Hoffman, T. (1996). Inhabited digital spaces. *Proceedings of Conference Companion on Human Factors in Computing Systems: Common Ground* (pp. 9-10). New York, NY: ACM Press. Retrieved November 14, 2003, from <http://doi.acm.org/10.1145/257089.257094>
- Dodge, T., Carteaux, R., & Tuzun, H. (2003). *Quest atlantis: developing participant structures that transform*. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.
- Garris, R., Ahlers, R., & Driskell, J. E. (2002). Games, motivation, and learning: A research and practice model. *Simulation & Gaming*, 33(4), 441-467.
- Langton, N. H., Addinall, E., Ellington, H. I., & Percival, F. (1980). The value of simulations and games in the teaching of science. *European Journal of Education*, 15(3), 261-270.
- Mayer, R. E., Schustack, M. W., & Blanton, W. E. (1999). What do children learn from using computers in an informal, collaborative setting? *Educational Technology*, 39(2), 27-31.
- Prensky, M. (2002). The motivation of gameplay or, the real 21st century learning revolution. *On The Horizon*, 10(1), 5-11.
- Thomas, M. K. (2003). Designers' dilemmas: The tripartheid responsibility of the instructional designer. *TechTrends*, 47(6), 34-39.
- Turkle, S. (1995). *Life on the screen: Identity in the age of the internet*. New York, NY: Simon & Schuster.
- Tuzun, H. (in press). Motivating learners in educational computer games. *Annual Proceedings of Selected Research and Development Papers Presented at the National Convention of the Association for Educational Communications and Technology*.
- Tuzun, H. (2004). Metodyka kształcenia online. *e-mentor*, 2004(2), 9-10.