

Preface

Can a game motivate students to learn effectively? Can it improve one's knowledge and skill as a motivator of study? As part of an international dialog between researchers in educational technology, this key question and many more related to it have led to this new collection of ideas, research, and reflections by researchers looking for answers.

The word "gaming" is included in the title of this book to ensure readers know we are talking about the heart of playing games and its role in classroom-based learning. Thus, this book is intended primarily for classroom teachers as well as pre-service teachers who are looking into games with an eye to their potential for improving teaching and learning. If this is you, then welcome to an emerging community!

The authors here approach their work variously as experimental, development-based, philosophical, conceptual and pragmatic, and sometimes in several configurations of these perspectives. Hopefully, this means you will find several chapters here that are to your immediate liking and others that will appeal to you in time. Perhaps a few chapters will not be exactly what you are looking for now, but we trust they will all guide you to think further about the issues, lead you to deeper levels of research, and help link you with active researchers in this emerging field.

An edited collection of different authors presents a challenge, an opportunity, and a diversity of viewpoints, opinions, and research perspectives. This book is expected to repay your time spent in browsing and sampling its many offerings and will serve you as a reference for future forays into its subject: gaming for classroom-based learning that seeks to motivate teaching and learning for game players.

GAMING RELEVANT TO CLASSROOM TEACHING AND LEARNING

Is a game a learning tool which can be adopted in classroom teaching and learning? Or is it a systematic learning environment? In the perspective that learning is an ongoing process, contexts where gaming for classroom-based learning happens can be established as a dynamic learning environment through the various, frequent, and prompt interactions between players and the systematic environment of a game.

Digital games have often been categorized as harmful media by both parents and educators. This is partly due to their understanding that students are spending their time on gaming just for fun. They also think that study and fun cannot coexist and that study requires deliberate hard, not fun. They often misunderstand games' value for education. This is partly caused by their perception of many diverse types of games in the same way.

Learning components, rules, strategies, scaffolding, feedback, controls and management, and collaborative work among players are all incorporated in the interactions of digital games. In order to effectively use games in the classroom, teachers and parents need to agree on games' positive functions toward students' learning, decide and select good educational games relevant to content and tasks in

the classroom, and disseminate their acquired knowledge into the teaching field. Many chapters in this book attempt to implement results in achieving learning objectives. Those chapters are deemed to refresh possibilities and affirmation in gaming for classroom-based learning fields.

Dan O'Brien proposes a taxonomy of digital games in education based on the cognitive functions and skills players engage. The theoretical basis for the taxonomy was drawn from Gagné's Five Categories of Learning Outcomes, Bloom's Taxonomy of Educational Objectives, and Jonassen's Typology of Problem Solving. The links between these theories and the educational games taxonomy will allow educators and researchers to understand games in light of their educational affordances. Instructional design based on these theories can more effectively integrate games into the classroom.

In designing effective gaming environments, one perspective is that teachers and students can both utilize gaming activities in classroom practice and curriculum development. Collin Price and Moore's expectation is that the expectation of utilizing new digital technologies in learning contexts by both teachers and students may change classroom practice and inform curriculum developments. They start from a review of current educational issues and move to an evaluation of educational theory and instructional design principles. Their proposed and developed "Educational Immersive Environments" may embrace both the technology and their approach to develop their own learning resources. They suggest a new theoretical approach based on situated learning, the experiential learning cycle of Kolb, and the ARCS model of Keller. Another perspective is manifested in Danielle McNamara, Tanner Jackson, and Art Graesser's chapter. They approach gaming's effectiveness from the game design side. Their point of view is that game-based learning improves students' motivation with the instructional system. They describe a conceptual framework that provides a guide to how adding game-based features and components may improve the effectiveness of ITS learning environments by improving students' motivation to engage with the system. ITS researchers have begun to incorporate game-based elements within learning systems. They provide insight into how elements within each category may affect various types of motivation.

We cannot deny that teachers are a critical factor in a game-based learning system, even though students have initial control for their gaming activities. Thus teachers' perceptions are critical to the success or failure of integrating digital games, as indicated by Ayotola Aremu. He goes on:

If teachers' attitudes are negative and they do not have a say in how to use the innovation, then no matter how well a game has been packaged, it would not be effective (Aremu, 2004). One way to ensure positive teachers' attitudes is to involve them, right from the teacher training period, in design, validation, and implementation.

He provides support for the effectiveness of the use of digital games in the classroom and presents teacher perceptions on how to use a computer game in the classroom. He also recommends that teacher preferences should be integrated into the design of games as well as training on the integration of games in the classroom and teacher training should place an emphasis on practical sessions of game playing in the curriculum so as to develop teachers' competence and confidence in the use of games. This would go a long way in ensuring that teachers implement educational games in their classroom.

Educational games, especially off-the-shelf games, necessitate a redesign of curriculum activities to fit into classrooms. David Gibson describes the architecture of participatory media and the transition in formal education needed to mine the spare time and effort of learners. According to Gibson, teachers who are trained to travel both ways on this bridge can be highly effective in creating new learning experiences that function as spreadable media appropriated by teens and others in a myriad of new ways in the emerging participatory culture of schools of the future. He uses the game-based learning framework of The Global Challenge Award program in order to illustrate the framework of the participatory media bridge between informal and formal education.

CASES OF GAMING USE IN TEACHING AND LEARNING

Many teachers, educators, and researchers are searching effective ways to use gaming in the classrooms of various subject areas and school levels. Elizabeth Katzlinger deals with a training curriculum for kindergarten teachers to introduce a learning game for technology-enhanced language learning in early childhood and how kindergarten teachers can launch the game in their classes. The game consisted of observation and experiment with the language, e.g., to write characters and listen to them. The children can choose where they want to learn and the speed of learning in the game. Avatars explain the game and give hints and positive feedback to the player. In the teacher training course, there is time to play the game in the same way the children play it. Additionally there is time for pedagogical reflection about the learning game and how it can be used with children. Shawn Graham did a case study of interactive fiction in an elementary classroom and suggests that the process of creating a text-based game helped improve literary and social skills amongst the students.

This concept of interactive fiction points to the literary aspirations of the best of the new creators – that the computer would merely provide the setting (the simulated world); the game playing would in fact be an act of writing. By performing the game, the player – the reader – creates her own narrative, her own story, which (in the best works) only happens once.

Hoe Kyeong Kim uses multiplayer English teaching online games and finds that elementary students' online game experiences increased self-efficacy. Interestingly, students with low social-affective values showed more improvement than those with high social-affective values in both self-efficacy and performance scores. On gaming tasks, six interactive games focus on identifying alphabet phonics. These interactive online games use jigsaw puzzles and picture matching activity formats. As for learning tasks, students read level-appropriate E-books and animation books, take quizzes on three language skills (reading, writing, and listening), and complete given tasks.

Louise Sauvé shows that the on-line game STIs: Stopping the transmission, supported learning in terms of structuring of knowledge and integration of information for youth between the ages of 14 and 15 also uses online games to stimulate learning based on the findings of STIs in online games: Stopping the transmission, supporting learning in terms of the structuring of knowledge, and the integration of information for youth between the ages of 14 and 15. The games have positive results on the way learners mentally build schemas. This helps the learner with problem solving, visualizing concepts, and establishing links. Therefore, “the game allows the learner to integrate new materials and new concepts in a more intuitive manner and also helps the learner organize previously acquired information in a more comprehensive manner”.

How do teachers bring the realities of decision-making and action into the curriculum? Hélder Fanha Martins considers that games help students to gain a real ‘feel’ for collaboration, managerial decision-making and teamwork, and describing how a web-based competitive management game helps to achieve business decision-making. Overall, the simulation game course was seen as a better vehicle in helping students make career preparations, achieve educational goals, and utilize time. He notes:

The most obvious advantage of using simulations is the ability to replicate real-world environments. Additional advantages include the ability of participants to actively engage in the learning process, develop critical thinking skills, become team players, captivate a competitive spirit, interconnect decision making, risk taking and management of operation, and just as important, have fun.

Adam Friedman, Richard Hartshorne, and Phillip VanFossen answer the question of the potential of massively multi-player online role-playing games (MMORPGs) meeting content standards in social studies. They attempt to describe the degree to which guild leaders and members in World of Warcraft

engaged in civic gaming experiences and to explore the relationship between civic participation and leadership in the virtual world of WoW and the world outside the game. They concluded that both guild leaders and guild members tended to be politically moderate on both social and fiscal issues.

USE OF GAMING IN VIRTUAL WORLDS

Teaching and learning in virtual worlds has recently become an increasing topic of study in many research journals. More and more schools are building their classrooms and campuses in virtual worlds. Also, researchers have shown their interest in using virtual classrooms for their own purposes. This increase in popularity arises from the fact that virtual worlds offer an opportunity for people to interact in a way that conveys a sense of presence lacking in other media. Tele-presence, based on the vividness of increased reality and interactive roles of multi-users, appears to be a characteristic of virtual worlds. Gaming in virtual worlds includes massively multiplayer online role-playing games (MMORPG) such as Everquest Online Adventures (EQOA) and MUD (Multi-User Dungeons) such as Dungeon-Dragon. This type of virtual gaming enables gamers to engage in social learning, socialization, and meta-learning, thereby helping them to acquire social skills.

Virtual worlds, by their very nature, facilitate meta-gaming, multi-skills, and multi-literacy for their residents. Modding and rezzing, creating new resources in computer games and virtual worlds by modification is a popular pastime activity of the new generation of learners.

Regina Kaplan-Rakowski and Christian Sebastian Loh provide an overview of the modification process to create new resources within a virtual environment. Readers can understand the potential of these activities for education, and to possibly integrate some of them into school curricula. However, gaming for classroom-based learning should mesh with classroom environments. Brian Bauer introduces new tools, a Virtual Corporate Environment Business Tool box in order to match virtual worlds to reality and determined that although users were open minded to trying virtual worlds and other types of immersive technologies, the solutions delivered needed to provide task-oriented functionality. Educators have “a vision for what they hope will happen in a virtual world, but quite often the vision does not mesh with reality.”

Brian Ferry, Lisa Kervin, and Lisa Carrington summarize six years of research that has consistently found that games and simulations in the virtual learning environment of ClassSim provide an effective way of introducing pre-service teachers to their future work in classrooms. They used various methodologies during their studies with ClassSim such as semi-structured interviews, observations and the collection and analysis of artifacts; surveys of users; group interviews after initial and final use of ClassSim; and analysis of users’ logs. They report that through engagement with the VLE and their field experience, a number of pre-service teachers incorporated teaching terminology into their everyday language.

How do virtual games enable gamers to engage in social learning, situated learning, and problem based learning on the one hand, and in meta-gaming, meta-literacies, and multi-tasking, on the other hand? Chaka Chaka takes notice of meta-gaming, meta-literacies, and multi-tasking through five case studies involving five virtual games: Everquest Online Adventures; NUCLEO; Homicide; Mad City Mystery; and Lineage. Five case studies show how virtual games help leverage multi-skills and multi-literacies for gamers and illustrate how virtual gaming serves as an ideal platform for harnessing 21st-century skills.

Teachers and educators need to explore the benefits of applying game-based learning in virtual worlds. Maria Toro-Troconis and Martyn Partridge explore the elements associated with game-based learning in Second Life, focusing on the design process. They say:

We attempt to explore the elements associated with game-based learning in Multi-User Virtual Environments, focusing on the design process and how effective game-based learning activities can be achieved following pedagogic frameworks. We view learning in games as a form of “experiential learning” reflected in the design and development of the Imperial College virtual hospital explained in this chapter.

The preceding chapters imply that gaming for classroom-based learning is best when social interactive play such as self-organization, instrumental coordination, and sociability occurs. Players in virtual worlds can manipulate concrete objects in the world enjoyably, exercising immersive explorations to the new world which has been hidden to them. Especially in virtual gaming and simulation, they assemble several objects and create new objects as they see fit. These activities allow players to analyze, evaluate, and synthesize given data, objects, or facts. They have an opportunity to explore whatever ideas they have in mind. Thus, virtual gaming adds much more self-directive activities and live experiences for classroom-based learning.

EPILOGUE

Gaming can be a motivator for classroom-based learning. Learners, who are active players, are apt to fall into playing and learning simultaneously. In addition to the obvious traits of fun and immersion, challenge, curiosity, control, fantasy, collaboration, and competition are some of the main elements which attract the attention of players. The external structure and genre of games are sufficient enough to endow players with fun and immersion. However, games for classroom-based learning should match content with learning objectives and guarantee the effectiveness of the game. This point leaves a concern that games for classroom-based learning should include motivating elements while they also contain learning content.

Gaming use in the classroom serves as edutainment insofar that play a natural human instinct. As such, teachers in classrooms let learners play and arrive at the terminal behavior by their own will. Gaming needs to accompany the spontaneous activity of learners. It should not serve as another constraint or pressure to them. Thus, gaming for classroom-based learning needs to relate the activities of players to their current environment.

Another aspect for gaming in the classroom is that it promotes experiential learning. Experience, according to Dewey, is a process, not an outcome. Experience is a whole process of humans adapting to their surroundings. It comprises both behavior and thinking. Therefore, gaming for classroom-based learning must give actions as well as reflections based on social interactions.

For the last aspect, learners in 21st century are living in digital age where learning happens anywhere, anytime. Learning is ubiquitous and goes beyond classrooms in this open society. To be sure, gaming and games, if educationally designed and offered at low cost, can contribute to youngsters’ learning.

The final chapter explores the internal structures of games and activities of players learning with games with a view to discovering what kinds of application types and game activities are meaningful in classroom settings. It presents obstacles and solutions for using games in classrooms and finally suggests an instructional design process for teaching with games in classroom settings.