The construction of knowledge through gaming. How to engage university students in the understanding of the historical developments of knowledge and scholarship via playing and networking

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Abstract

Game-based learning is an acknowledged and valued teaching approach in children's education and is gaining increased acceptance in some sectors of professional training. However the educational value of games is still sometimes questioned in academic circles. On the other hand evidence of use of games in university teaching reveals that students welcome the idea of adding games to their portfolio of learning opportunities. The article investigates the current status of game-based learning in education; introduces the theoretical framework supporting game-based learning; presents an example of a Flash game developed for the higher education sector. 'The Secrets of Biblioland' is a web-based educational interactive game designed to enable university students to develop information literacy skills and awareness of the historical developments of scholarship and publishing, of the role of libraries and knowledge repositories, of cataloguing resources, using libraries and searching engines, producing appropriate referencing.

Keywords: game-based learning, information literacy.

1. Academic literacy and knowledge construction. New learners, new media, a multiplicity of information literacy domains

Academic literacy entails the acquisition of sophisticated levels of competency in gathering, cataloguing and handling information from a variety of sources. University students are also expected to rapidly familiarise themselves with academic traditions such as referencing correctly from books and academic journals. Traditionally students have been invited to spend their time in libraries and encouraged to read print sources such as academic books and journals. However communication technologies have introduced new ways to access information; the means for acquiring and sharing information are now global and networked, print media is now only one of the many tools available to students and researchers. "Printed paper provided the primary means for the dissemination of literate scholarship and became the primary medium of academic communications…However, for at least the last150 years, the hegemony of printed paper has been increasingly challenged by other media (photography, sound recording, film, television, etc.)." (Ingraham et al., 2007, p.166). Digital media, the Internet, e-books play an increasingly important role in learning and teaching strategies in higher education. Nevertheless the history and traditions of academic knowledge construction still constitute the starting point of the students' academic journey; it is therefore essential to find innovative ways to engage the new generations with such traditions, using the type of media that is more familiar to them. The new generations of learners that are now engaging with academic literacy are avid and expert media users. The "digital natives", as defined by Marc Prensky (2001b), move comfortably through different digital media platforms and expect to find and exchange information quickly and effortlessly. Their experience of information literacy is not exclusively based on print media: "In the modern world print

literacy is not enough. People need to be literate in a great variety of different semiotic domains…Furthermore, and more important, people need to be able to be literate in new semiotic domains throughout their lives." (Gee, 2003, p.19). Computer games are an important aspect of such variety of semiotic domains. Over the last decade digital games have become a mainstream form of entertainment, successfully competing with films and television. But games are not just a way to entertain teenagers and young adults, they can also become highly effective educational tools for the "digital natives" generation.

2. The use of games in education. The theoretical background to game-based learning

Game-based learning methods are widely accepted in children's education and have become an important part of interactive educational packages (De Jong, 2003). The professional training industry has also been keen to exploit the learning potential of digital games. Corporate training has made use of such games for a variety of staff developing purposes. Marc Prensky has been advocating game-based learning for professional training as well as for academic studies; he has identified the US military establishment as an enthusiastic early adopter of training games (Prensky, 2001). Games are now gaining more credibility as educational tools; well-established commercial games such as SimCity, The Sims, and other management and strategy games are used in business studies, sociology and other academic disciplines (Hays, 2005; Foreman et Borkman, 2007). Research projects on the educational value of games are now exploring the potential use in academic settings, expanding from the mere evaluation of individual projects to the more theoretical aspects of game-based learning. Richard Van Eck has examined the factors involved in the implementation of game-based learning in higher education; he argues that "Many serious game proponents have been conducting research on how games can best be used for learning, resulting in a small but growing body of literature on DGBL as it embodies well-established learning principles, theories, and models." (Van Eck, 2006, p.18). The theoretical background to game-based learning maps very diverse traditions, including game design theory (Crawford, 1984; Salen et Zimmerman, 2003), audience analysis, narratology and ludology (Frasca, 1999; Mateas et Stern 2006), instructional design and learning theories (Aldrich, 2005). The relationship between game-based learning and pedagogical issues is crucial to the success of educational games. Katrin Becker has identified strong links between the learning activities occurring in commercial games with the learning theories of Jean Piaget and other important educationalists. She has drawn parallels with, among others, Gardner's theory of Multiple Intelligences and David Kolb's and Roger Fry's theory of Learning Styles (Becker, 2007). The recent literature on game-based learning for adult education is exploring issues about the design and development of learning games, their educational value, the learners' profiles and expectations, the impact of games on students' learning and especially the problems associated with producing ad hoc games for the education sector (Hays, 2005; Michael et Chen, 2006).

3. *The Secrets of Biblioland* game

 The Secrets of Biblioland is a web-based interactive game designed to support university students in developing academic information literacy skills and awareness of the historical developments of scholarship and publishing, of the role of libraries and knowledge repositories, of cataloguing resources, of using libraries and searching engines, of producing appropriate referencing. The game should be used as a component of a blended learning strategy intended to complement the traditional teaching of academic skills that usually takes

place in the first year of undergraduate programmes. The game takes the students through the discovery of such tradition by taking on the role of the champion of the *Lost Reference*. The gamers embark on an adventure to seek the *Lost Reference* prompted by a request from a member of the *Fellowship of the Seekers*. During their journey they visit ancient and contemporary libraries and are confronted with the historical development of knowledge and learning. The game story and mechanism lead the students/gamers from Socrates to the Library of the Future via Ancient Alexandria, medieval abbeys, an encounter with Johannes Gutenberg, and a visit to the British Library. The game characters introduce the players to the developments of writing technologies, discuss issues about access to knowledge and learning, about authorship and about the role of libraries. In the Plagiarism Cellar students have to confront the debate about referencing, plagiarism and academic misconduct.

3.1 Narrative, identity and community: gamers actively participating in the perpetuation and construction of knowledge

The Secrets of Biblioland is designed according to the typical adventure game structure: a quest, a call to take up the challenge, a journey disseminated with obstacles and puzzles, the final test and the conclusion of the quest. The story is at the centre of the pedagogical construct of the game. It is via the historical excursus through the various libraries that the gamers learn about the changing nature of knowledge repositories and about the role played by writing technologies in the transmission of knowledge. Therefore the story becomes an integral part of the gameplay and links to the additional learning materials distributed on the associated website and blog. Gamers are playing as Biblioland champions, they are constantly reminded of their fundamental role in the survival of Biblioland, in the preservation of the old traditions but also in the construction of new knowledge. In their role as members of the *Fellowship of the Seekers* they learn by doing as well as by collecting evidence, reflecting and making choices. They become active participants in the fate of Biblioland and, conversely, in the traditions that Biblioland represents. Upon completion of the game students gain access to the associated blog, where they can continue their experience with the *Fellowship of the Seekers*. The blog is intended to support a community of learners where students and tutors can open a debate about issues on academic writing, researching tools and skills, referencing and especially plagiarism. The game also has a presence in the *Second Life* virtual community, the development team is currently exploring ways to export some of the game elements in *Second Life* and as mobile phone applications.

3.3 The Secrets of Biblioland, the production choices and challenges

Designing and developing ad hoc games for the higher education sector, as opposed to exploiting commercial games, presents a number of difficulties due to the scarcity of available funds, the limitations of resources and expertise and issues about accessibility and usability. However there are distinctive advantages in producing ad hoc educational games: a clear focus on the subject matter, the possibility to embed relevant educational content and links with other online learning materials, direct control over the game structure and aims, a strong academic input in designing the educational aspects of the game. *The Secrets of Biblioland* game has been produced using Adobe Flash and features 2D illustration and animation. The choice of such technologies is related to accessibility and reusability issues and to the limited available budget and time-frame. The game has been developed by a team of academics specialising in digital media: Elena Moschini (team leader), Che Guevara John and Vanda Corrigan from London Metropolitan University and Enrico Benco from Middlesex University. The team has adopted a user-centred approach: the game idea, the interface and game mechanisms and the learning materials have been tested during the production phases

via a series of focus groups with students and academics (Moschini, 2006). *The Secrets of Biblioland* project has been awarded an ESCalate Development Grant and a grant from the Learning et Teaching Projects Fund, The Centre for Academic Professional Development, London Metropolitan University. The game and the accompanying learning materials are accessible on the web at: http://www.biblioland.org.

4. Conclusion

Game-based learning in higher education is moving from the early stages of enthusiastic expectations to an operational implementation phase revealing the need for a systematic approach to the analysis of educational games. This is a relatively new field for both game designers and educationalists and requires attentive choice of production methods, more evaluation projects and further research. *The Secrets of Biblioland* game constitutes an attempt to explore ways to apply game-based learning principles to the acquisition of academic literacy skills and to introduce a new generation of university students to knowledge repositories, authorship, referencing and plagiarism issues and the development of writing and scholarship traditions.

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