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Creating a Repository of Community Memory in a 3D Virtual World: Experiences and Challenges

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Abstract. In this paper, we focus on creation of 3D content in learning communities, exemplified with a Virtual Gallery and Virtual Research Arena projects in the virtual campus of our university in Second Life. Based on our experiences, we discuss the possibilities and challenges of creating a repository of community memory in 3D virtual worlds.

Keywords: repository of community memory, learning communities, 3D virtual worlds

1 Introduction

In this paper, we focus on affordances of 3D Virtual Worlds (VWs) for facilitating collaborative creation of repositories of community memory. From an epistemological perspective, knowledge resides in and is accessible from these repositories. The choice of 3D VWs is motivated by the potential and capability of such environments to support collaborative activities and work with various types of content [1,2]. Most VWs allow creating, manipulating, and sharing 3D objects and other media.

In order to better understand the notion of community memory we refer to the seminal work on communities of practice [3] and the theory behind organizational memory [4]. Continuous negotiation of meaning is the core of social learning and involves two processes: participation and reification [3]. The collection of artifacts appeared in these processes comprises the shared repertoire and history of the community. We describe learning process and creation of knowledge as characterized by narratives, collaboration, and social constructivism [5,6]. Narratives are used for the diagnosis of problems and as repositories of existing knowledge, be that tacit or explicit [7]. They contain the tacit knowledge of a given domain and field of practice, and provide a bridge between tacit and explicit knowledge [8]. Through collaboration in shared practices, knowledge may be created as well as distributed among the participants. Such a socialization process may give the learning access the *episteme* or *underlying game* of a discipline, the most difficult knowledge to access [9].

Walsh and Ungson propose that interpretations of the past can be embedded in systems and artifacts as well as within individuals through the narratives they may convey [10]. An important concept for community memory is ‘boundary objects’ that exist on the practice and social boundaries and are used across them. They contain sufficient details to be understandable by both parties, after the information they contain is de-contextualized [4]. To conclude, organizational and community memory consists of mental and structural artifacts [10], but it can also be thought of as a process and representational states [4]. In addition, an integral part of community memory is the histories and trajectories of its members as expressed in narratives that are represented as the community’s shared repertoire.

Further, we present our prototypes and discuss how 3D VWs can be used not only as place of enactment, but also for accessing data to be enacted or collaborated into knowledge. In this way, our idea of a repository is more connected to narratives, artifacts, and boundary objects than to traditional data.

2 Prototypes: Virtual Research Arena and Virtual Gallery

The Virtual Gallery (VG) was intended to assist constructing, presenting, and storing student 3D visualization projects in a shared repository and designed based on the results of a case study [11]. A library of pre-made 3D objects, scripts, and textures could allow concentrating more on the creativity instead of technical details. In addition, student 3D visualizations occupied considerable amount of space in our virtual campus in Second Life (SL), and a better storage solution required.

The VG prototype was implemented, including a realistically reconstructed building (modeled after an existing student society house), a gallery for storing and presenting 3D constructions, and a library of pre-made resources (Fig. 1). In two other studies [12,13], we collected student feedback on the VG and its functions. Most of the student groups stressed the importance of having access to previous students’ constructions for inspiration. Some of the groups stated that they get additional motivation from exhibiting their construction for other people.

We studied further the possibilities of 3D VWs for educational visualizations and supporting learning communities that can form around them. We developed a framework, Virtual Research Arena (VRA), for creating awareness about educational and research activities, promoting cross-fertilization between different environments and engaging the public [12] that was later implemented as a prototype in SL. It provides appropriate atmosphere, tools, and facilities for the community activities (seminars, meetings, and discussions). VRA is a place, where students and researchers can express themselves trying out, visualizing and sharing their ideas (using VG resources). It should accumulate ‘reifications’/traces of community activities over time, thus becoming a community repository, containing different layers of community activities.

VRA prototype functions as a virtual extension of the Norwegian Science Fair festival where research projects are presented to the public in a set of pavilions (Fig. 2). A city landmark – King Olav Tower was reconstructed on the virtual ‘central square’ that serves as a venue for the fair in reality, to create a familiar atmosphere

and a meeting place for the online visitors. While the physical pavilions at the fair were deconstructed at the end of the event, the virtual ones and the student constructions with activities traces have been preserved. The feedback collected in a case study [12] showed that most of the students and visitors acknowledged the potential of 3D VWs and VRA for supporting social networks and collaboration among various groups of participants as well as the importance of preserving their own constructions.

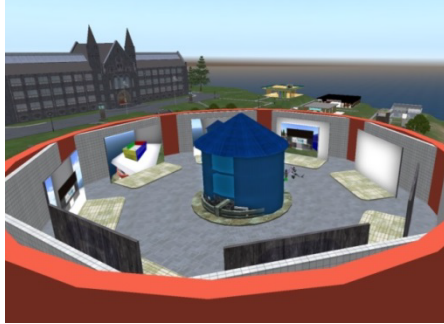


Fig. 1. Virtual Gallery prototype



Fig. 2. Virtual Research Arena prototype

3 Discussion and future work

Our experiences show that collaborative 3D content creation has enriched the reflective dialog in the communities with innovative expression forms. It has contributed to creation of a shared repository of community knowledge, consisting of such elements as narratives, boundary objects, and virtual places. The total knowledge of a community consists of the tacit and explicit knowledge that reside in the objects, places, and relations developed by the participants. The prototypes we presented afford the learner to develop knowledge through explorative and constructive methodologies, and through access to narratives and the development of relations. This implies that 3D VWs may thus offer richness in available resources for learning rarely found in a real-life situation alone. The epistemological landscape is in this perspective augmented with sources for knowledge commonly not included. At the same time, the situated, contextualized, and partly ephemeral nature of these repositories suggests the following challenges, especially when comparing to ‘traditional’ repositories.

- *Platform and context dependence*: storing and transferring 3D constructions between different platforms is not always possible. In addition, even when technically possible, the 3D content in the repository might lose its context and connections, e.g. when ‘storing’ a virtual place without the activity that gives meaning to it.
- *Rights management*: clearly showing the ownership of the created content is important for both visualizing trajectories/activities of community members as well as addressing the copyright issues. However, managing rights in SL and other VWs are often in the conflict with flexibility of constructing and storing the content.
- *Indexing and annotating* of a repository containing ‘narratives/ crystallizations/ traces of community activities’ is complicated due to the fluid nature of the learn-

ing communities, but also to the ambiguity of the content which might be interpreted differently depending on the context and the background of the visitors.

- *Shared sense of place*: though many of the challenges are associated with contextualization of the content, it could in some cases be seen as an advantage, as it provides community members with a shared understanding and shared sense of place.

There is still a need to explore further the affordances of 3D VWs for supporting such ‘fluid’ repositories of community knowledge as well as developing methodologies for managing and annotating such repositories. It is important to take interdisciplinary nature of such repositories into account, since they contain both tangible and non-tangible artifacts, as well as the different types of media and content they contain.

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