The self regulated community of learning and its impact on learning in 3D virtual learning environments.

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Abstract

This paper investigates Self Regulated Learning in 3D Virtual Learning Environments (3D VLEs). The theory of the Self Regulated Community of Learning (SRCL) proposed in this paper is within the paradigm of cognitive theory and social constructivist conceptual framework. The theoretical research in this paper is two-fold, taking both ecological (i.e. animal behaviourism) and pedagogical perspectives (i.e. cognitive psychology and constructivism) into consideration and suggests that, similar to the division of labour within ant society, Multi-user Online Role Play (MUORP) is a mechanism behind SRCL within 3D VLEs. SRCL leads to an optimum state of VLEs and, in turn, maximises learning enhancement. Two different aspects of 3D virtual worlds, i.e. Second Life and EVE Online, will be explored. The intended research outcome is to disclose the interrelatedness between SRCL and 3D VLEs and the impact of SRCL on Learning. New insights in distance learning and on-campus e-learning pedagogy are expected to be gained via a multidisciplinary study at University of Wales, Newport, in the next two years. This research project will involve the School of Health and Social Science, the Newport Business School and the Centre for Excellence in Learning and Teaching.

Introduction

Virtual Learning Environments (VLEs) facilitate the shift from traditional teaching and learning to modern settings. Simply put, from knowledge transfer to collaborative learning. The recent development of 3D Multi-user Virtual Environments (3D MUVEs) (e.g. Second Life, Wonderland) has further advanced this transition which leads to student-led learning.

The proposed theory of SRCL in this paper is derived from “Self Regulated Society” (Arcaute et al., 2007) in the study of ant behaviour, and will be tested fully via a multidisciplinary study at University of Wales, Newport, over the next two years. The 3D MUVEs employed at the initial phase of the research include Second Life (SL) and EVE Online (a Massively Multi-player Online Role-Playing Game - MMORPG) which will be discussed further in this paper. The second phase of the research involves new project implementation which will be based on the findings from initial live case studies in terms of platform selection, learning outcomes and other cost and rewards indicators.

Like all instructional technologies 3-dimensional virtual worlds for learning are only as effective as the vision and the pedagogy that guide them (Bronack et al., 2006). Besides the proposed theory of SRCL, new insights into distance learning and on-campus e-learning pedagogy are expected to be gained via the aforementioned multidisciplinary practice, because not only can
technology aided learning help tutors be more creative in teaching, but also encourage students to grapple the opportunities with improved learning capabilities.

**Theoretical Background**

**SRCL and SRL**

The concept of Self Regulated Learning (SRL) has been introduced and developed over decades and its root can be traced back to 1964 (Bandura and Kupers, 1964) or even earlier. SRL recognizes that each individual is balancing her/his learning needs, all the learning needs of the society with other commitments s/he has. However, their learning is being controlled and regulated by the environment which may or may not be the learning environment they are working in. SRL is defined as “students personally initiate and direct their own efforts to acquire knowledge and skill rather than relying on teachers, parents, or other agents of instruction” (Zimmerman, 1989). It includes three elements: “students' self-regulated learning strategies, self-efficacy perceptions of performance skill, and commitment to academic goals” (Zimmerman, 1989).

Contrary to Zimmerman's approach, which only tends to be individually focused, this paper considers the metaphor of the community being dominant and the people's roles within it being mitigated by the community. A SRCL is egalitarian by nature. Rather than being seen as suppressing and subordinating the experience of the individual in favorite state, it is being seen as the key element within the learning process and is actually a positive thing. It's not like a terrible imposing state or educational communism; instead it's about the individual creating something with other people. Existing research suggests that a learner “first becomes able to subordinate her behaviour to rules in group play and only later does voluntary self-regulation of behaviour arise as an internal function” (Vygotsky, 1978, p. 90).

**SRCL in collaborative and social learning**

The social aspect is a principle focus in the existing literature regarding learning in virtual environments (e.g. Bronack et al., 2006; Zimmerman, 1981; Paris and Byrnes, 1989; Minocha and Roberts, 2008), because “learning occurs first on the social level (interpsychological level) and next on the individual one (intrapsychological level) (Vygotsky, 1978)” (Bronack et al., 2006) and “knowledge construction is achieved by the interaction that takes place within oneself through reflective thinking and by the interaction that occurs in communications and collaboration with other people (Vygotsky 1978)” (Minocha and Roberts, 2008, p. 184). Whilst following the same theoretical line and the theory of SRCL, this paper develops these ideas further within the paradigm of cognitive theory and social constructivist conceptual framework.

Theoretical research paper approaches pedagogical perspectives taking cognitive psychology and constructivism psychology into consideration (e.g. Zimmerman, 1981; Paris and Byrnes, 1989; Bandura and Cervone, 1986; Pressley et al., 1987). However, this research project wants to contrast that with animal behaviorism where the division of labour serves as a self-regulatory mechanism, which previously has not been used in a pedagogical context. Therefore, this project will look at animal behaviour, SRCL and social roles within the community.

Although the existing literature acknowledges the presence of SRL within Virtual Learning Communities (VLCs) (Delfino et al., 2008), matters such as the form of it, and the mechanism behind it, have not been explored in great detail. Also, the importance of role-play in SRL has not been examined within synchronous contexts (e.g. 3D MUVEs). Thus, the real impact of MUORP on the learning in 3D VLEs remains unclear.

The similarities between insect (e.g. ants and wasps) behaviour in the real world and human behaviour in VLEs have emerged from comparative literature review. “In the ant colony system, the relevant “optimum” state is when division of labour is achieved”
because the “resilience and robustness” of ant society is dependent upon a “self-regulatory mechanism”, and “division of labour is one such mechanism giving rise to self-regulation in nature” (Arcaute et al., 2007, pp. 2, 11, 12). The division of labour within ant society could be a close analogy to MUORP featured in 3D MUVEs, and is manifested via the 3D objects such as avatars which resemble the generic relationship between ants (e.g. proximity and anonymity). Hence, the hypothesis here is that MUORP is essential to the establishment and development of SRCL in 3D VLEs.

Furthermore, Arcaute et al. (2007) suggest that within wasp society, “the elites” do most of the work. The similar kind of behaviour also exists among learners in a classroom setting as well as in asynchronous VLEs though in different forms. However, the social distance and psychological distance between “the elites” and other learners are expected to be reduced via the adoption of 3D Multi-user Virtual Learning Environments (3D MUVLEs)

1 through SRCL evolved in the learning process because within such communities, it is more natural, spontaneous and convenient to communicate. In turn, the “shared sense of belonging, trust, expectation of learning, and commitment to participate” (Minocha and Roberts, 2008, p. 182) will help learners achieve both individual and communal benefits. This finding has further advanced Zimmerman’s claim (1995), not only is self-referential system the core to explain the failure of self regulation at the individual level, but also at the community level.

As a result, the earlier hypothesis can be amended as the following:

**MUORP is essential to the establishment and development of SRCL in 3D MUVEs. Learning can be achieved via SRCL by speeding up the transition from interaction to collaboration within a broad online social context. In turn, it contributes to the sustainability of VLCs in terms of both individual and communal benefits.**

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**Discussion**

**SRCL in modern learning settings**

Due to the pedagogical shift in modern learning settings, the top-down instructional approach has been gradually losing its prominence, and is being replaced by the bottom-up, student-led (or student-centred) approach. As a result, the role of educator will be shifted from instructor to facilitator and this is the major difference between pedagogical learning and andragogical learning. “Andragogy assumes that the point at which an individual achieves a self-concept of essential self-direction is the point at which he psychologically becomes adult” (Knowles, 1976, p. 56). However, Self Directed Learning (SDL) is fundamentally different from SRL, the former is about what to learn, the latter is about when and how quickly to learn.

The pedagogical shift in modern learning settings is accompanied by technological development, because the “growing interest in social dimensions of learning has led to institutions adopting Virtual Learning Environments (VLEs)” (Minocha and Roberts, 2008, p. 181). The ubiquitous nature of internet and web 2.0 technologies (e.g. wikis, blogs, video online, social networks) have given prevalence to distance learning in particular. However, current distance education “has more in common with traditional classroom-based instruction than it does with what distance education can become” (Bronack et al., 2006, p. 221). The most recent technological development in 3D VLEs has started to challenge the status quo. As Taylor and Chyung suggest (2008), the structure and function of the 3D graphic interface are rather significant to studies in the andragogical use of virtual reality, though the term, virtual reality, has already been dated.

In order to understand how 3D VLEs enable learners to break down the traditional pedagogical steps “from minimal or no knowledge to being a master of a certain set of information in a context” (Wasley, 2008, p. 2), the comparison between modern learning and traditional learning settings is essential.

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1 The acronyms - 3D MUVLEs, 3D MUVEs, 3D IVWs and 3D IMUVLEs will be used interchangeably throughout this paper, because these are distinctions without difference.
The adoption of the latest technologies beg the following questions: What elements of our traditional experiences should be preserved online, which should be modified and what are the impacts of the tools (platforms) we use on our abilities to achieve all of the above (Holmes, 2007)? Has socialisation been fully integrated with all the collaborative activities within a learning community (Minocha and Roberts, 2008)? How do 3D VLEs facilitate SRCL in modern learning settings?

SRCL in modern learning settings is largely dependent upon the degree of social presence. Social presence is vital to stimulate intellectual productivity in VLEs (Oravec, 1996), which is influenced by factors such as learner experiences, virtual proximity (immediacy) and anonymity (privacy) (Minocha and Roberts, 2008).

Research suggests that “ants increase their “keenness” to perform a task if they did it before” (Arcaute et al., 2007, p. 11) and individualized learning is achieved via group activities. Delfino et al. (2008) take user heterogeneity into consideration and reckon that individual learning experiences do matter a great deal in the process of SRL. As a result, learner experiences can be deemed as both a cognitive/metacognitive indicator and an emotional indicator in the study of the intertwined relationship between SRCL and the learning in 3D VLEs. Furthermore, as suggested by Boekaerts et al. (2000) “a lack of social learning experiences is the first important source of self-regulatory dysfunctions” (Delfino et al., 2008, p. 195). In other words, social learning experiences indicate the inseparable nature of cognitive theory and social constructivist theory, because not only can collective knowledge be constructed, but also the individual learner’s “intellectual sense of the materials on their own” (Minocha and Roberts, 2008, p. 182). Thus, Felix (2005) suggests having a synthetic view of the cognitive and social constructivist approaches (Minocha and Roberts, 2008).

In 3D VLEs, immediacy (proxy for realism) engendered from virtual proximity, is almost equivalent to real classroom setting, but not available in asynchronous learning. Contrary to Castronova’s (2005) point of view, the social environment that emerged from 3D VLEs is different from other social environments, because of the employment of 3D objects such as avatars in Immersive Virtual Worlds (IVWs). Avatars create anonymity, which also tends to reduce the gap between “the elites” and other learners and will have a positive impact on building SRCL within VLEs. It is worth noting that “the elites” are not necessarily bad things under different circumstances and the egalitarian nature of IVWs doesn’t promote educational communism as discussed earlier.

The existing literature of VLEs overwhelmingly concentrates on distance learning; the impact of virtual worlds on physical classroom learning has been somewhat overlooked. The potential cost and rewards from the integration of virtual world and classroom learning shall be explored further.

SRCL in mixed virtual world and classroom setting

Some existing practices in higher education are keen to apply the latest development of 3D VLEs to distance learning exclusively. In other words, the potential impact of SRCL on learning has been partially ignored because what higher education can become and the necessity of integrating 3D VLEs within classroom learning have not been fully realized.

In higher education settings, the orthodox formal learning is dominated by classroom learning. Virtual learning may either be a form of informal learning or serve as an experiential playground for both on-campus and off-campus students. 3D VLEs are complementary to classroom learning (i.e. didactic tutor-led learning), facilitating all learning activities, and informal learning in particular. This has made Zimmerman’s (1998) three-phase SRL activities model (i.e. planning, monitoring and evaluation) partially obsolete because it is purely based on the planning school. It fits in with formal classroom learning but has discounted the fact that “co-ordination of work in distributed teams is accomplished through spontaneous informal communication” (Minocha and
Roberts, 2008, p. 186). Informal networks evolve from informal learning. Not only can informal networks facilitate learning, but also contribute to the sustainability of VLC. As suggested by Delfino et al. (2007), there is a need for informal networks within members of the community to emerge for the sake of VLC regeneration.

“Informal learning can be a valuable component of the educational process, but it is hard to facilitate. Organized informal learning is an oxymoron” (Pence, 2007-2008, p. 175). This indicates the importance of SRL in 3D VLEs. Thus, this finding has broadened the hypothesis in the earlier section to place the concept of SRCL in a wider social context i.e. SRCL exists in fluid learning communities rather than simply established groups (De Lucia et al., 2009). However, it has also raised the question ‘are fluid learning communities capable of self regulating’?

One researcher suggests that he has learned many things about his real life by reflecting on his virtual world experiences (Antonacci and Modaress, 2008); however, this is only half of the spectrum. In order to have a holistic view of Technology Enhanced Learning (TEL), the reciprocation between real world (classroom learning) and virtual world experiences needs to be investigated further i.e. how does classroom learning experience affect virtual learning and how does virtual world learning experience benefit the classroom learning?

Although 3D VLEs harness collaborative learning via hybrid (i.e. linear and non-linear) interactions among learners and tutors “when the content warrants it [for instance], a class within the virtual world may be as linear and as structured as any” (Bronack et al., 2006, p. 230). Thus, a model can be constructed as the following: linear approach in general and non-linear approach at different stages of the development of SRCL, facilitated by technological development.

**Way Forward**

*New learning and teaching activities foster SRCL*

The latest technological developments in 3D VLEs have made new learning and teaching activities possible in virtual worlds. 3D VLE’s enable both learners and tutors to think creatively, rather than simply replicating real-world classrooms in 3D virtual worlds (Minocha and Roberts, 2008). However, it is worth noting that real-life classrooms are not inherently negative. Guided by cognitive theory and a social constructivist conceptual framework, the two different aspects of virtual worlds are being explored i.e. open ended MUVEs (e.g. SL) and gated MUVEs (e.g. EVE Online), which both feature synchronous interactions and collaboration among users.

SL will become the focal point for both distance learning and on-campus e-learning in this paper, because research shows that SL supports almost all the web features and the “social interaction is comparable to classrooms” (Atkinson, 2008, p. 18). However, the following questions need to be answered prior to the implementation of SL: what are the differences between traditional learning and virtual learning? How does SL facilitate learners breaking down the traditional pedagogical steps (Wasley, 2008)? How does SL foster SRCL?

Although online games “often support the creation of communities that actively develop and maintain themselves” (Bronack et al., 2006, p. 220), the effectiveness of existing MMORPGs (e.g. EVE Online) on the learning in higher education have not been given enough recognition yet.

From a software design point of view, SL and EVE Online have the same root in games and both feature role plays and simulations. However, SL is not a game and has real-life impact. Research suggests that as an active social experience, learners cannot be inactive in a game or simulation (Antonacci and Modaress, 2008). The actions of other people make the game or simulation open-ended and “add complexity and unpredictability” (Antonacci and Modaress, 2008, p. 117). This echoes the earlier suggestion in this paper that MUORP is the mechanism behind SRCL. Furthermore, not only can 3D IVWs facilitate learning, but unlearning, in order to achieve the acquisition of learner specialisation and adaptability (Arcaute et al., 2007) for the
purpose of knowledge construction and knowledge base replenishment. If each ad hoc group evolved within the specialisation and adaptability process they can be deemed as an activity centre, and then the above statements can be interpreted as similar to the emerging behaviour of ants e.g. when repairing damage to nest; other activity centres within the Self Regulated Society are stimulated. However, it is worth noting that the ant colony system is not open-ended, rather, it is predictable to a certain extent.

3D VLEs promote SRCL. Not only do 3D VLEs break down the traditional power hierarchy, but also impose minimal rules to regulate the learning environment as a fence to prevent SRCL from being eroded by other external factors. 3D VLEs are to provide students the resources to build the educational environment themselves, rather than being completely controlled by a tutor or being in complete isolation.

Both SL and EVE Online have their advantages and drawbacks. For example, it is not the time to abandon the existing web-based VLEs (2D VLEs) yet, because although 3D IVWs (e.g. SL) provide “strong support for synchronous interactions and collaboration, and immersive environments for experiential and constructionist learning” (Livingstone et al., 2008, p. 140), many elements for supporting learning and teaching are still absent, in particular the support for asynchronous collaboration, because most of the 3D IVWs are not designed for educational purposes though it facilitates “a high degree of interactivity and participation” (Kearsley, 2000, p. 78). As a result, it is important to integrate 3D IVWs with existing web-based (2D) VLEs (e.g. Moodle) and transform 2D MUVLEs into graphic rich 3D Immersive Multi-user Virtual Learning Environments (3D IMUVLEs). This gives rise to Sloodle (i.e. the deployment of SL via Moodle) to form a blended VLE. Under this approach, both social and technological benefits of the 2D and 3D VLEs will be examined further. In addition, EVE Online is a thematic MMORPG, thus its usage for higher education will be limited.

We expect Sloodle, an open-source project, will lead learners to focus on learning rather than technology and make effective use of the virtual world (Livingstone et al., 2008). We also expect to be able to better understand changes and challenges, student preferences, expectations and the “effective use of tools in ways unintended by the developer” (Livingstone et al., 2008, p. 147). Also, to better understand the difference between co-dependency and interdependency of individual learners in both virtual world and classroom settings, understand the three main factors (i.e. cost, quality and speed) of successful implementation of the 3D VLEs, and what can or cannot be compromised during the practice.

Through empirical research and real practice, an attempt to disclose the interrelatedness between SRCL and 3D VLEs and the impact of SRCL on learning will be made. New insights in distance learning and on-campus e-learning pedagogy are expected to be gained via a multidisciplinary practice at University of Wales, Newport, in the next two years. There will be a three-case approach in this research. The first two are parallel to each other, exploring two different aspects of the 3D virtual world i.e. the deployment of Second Life via Moodle for the first year undergraduate students in the School of Health and Social Sciences and EVE Online for the Newport Business School where students will set up virtual organisations. The third case, the Centre for Excellence in Learning and Teaching led university-wide Postgraduate Certificate in Developing Professional Practice in Higher Education programme, will be developed and executed online and informed by the findings from the two aforementioned live case studies in terms of platform selection, learning outcomes and other cost and rewards indicators.

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REFERENCES


