TOWARDS MASSIVELY MULTISTUDENT ONLINE CLOUD LEARNING ENVIRONMENTS (MMCLE)

PALIOKAS, Ioannis

Democritus University of Thrace

Department of Primary Education N. Chili, GR-68100, Greece

ipalioka@eled.duth.gr

Abstract

Virtual Learning Environments (VLEs) allow students and teachers to have multiple levels of engagement in educational, mental and social spaces. It is supported that the socially alive presence of individuals and the educational effectiveness that is being expected of the overall experience is being affected by a) the virtual identity concept, b) a minimum set of functional requirements related to Human-Computer Interaction and c) the critical mass of the virtual community. The forthcoming generation of VLEs combines cloud services with massive user contributions to offer virtual academic experiences in a holistic way.

Keywords: *Virtual Identity, Social Networks, Virtual Learning Environments, Human-Computer Interaction*

ACM Classification: K.3.1, K.3.2, H.4.3, H.5.1, H.5.2

1. Introduction

Teaching and learning in a Virtual Learning Environment (VLE) premise the use of a wide range of software tools, personal computers and PDAs, curriculum design, management of profiles, online help and documentation to gain better learning outcomes. Actually, VLEs are Content Management Systems (CMS) and any connection to learning should be considered under the right educational circumstances. They are called Learning Environments as they were designed to support academic staff, students and related procedures. But the experiences from a VLE go beyond the use of common software and hardware. It allows the multiple levels of engagement and it is transforming the roles of teachers and students as well as their motivation (Lennon and Maurer, 2003). The replacement of face to face interaction using projected selves is mediated through various means of Virtual Reality (VR) interaction or traditional online communication like text and/or audio messaging, gestures, etc. A minimum set of functional requirements like the synchronous communication tools and personalization, navigation capabilities as well as the awareness of the existence of other visitors propose what Arminen call

a 'socially constructed presence' (Arminen et al, 2008). But the representation of selves in a virtual social environment through digital puppets (avatars) introduces a number of keypoints:

- Pre-existing social structures are preserved in a more flexible and less strict way while new forms of social structures appear.
- Virtual identities do not (and do not have to) correspond 100% to the physical identities. They allow the experimentation with the identity concept and extend the representation of selves to the ideal.
- The visual representation of selves and the observable behaviour is limited by functional restrictions of the Human-Computer Interaction (HCI) and the community rules.

Usually schools adopt Blended Learning than pure Online Virtual Learning (Garrison and Kanuka, 2004). In Blended Learning solutions, pre-existing community structure and ethics continue to be active. On the other hand, Massively Multistudent Online Environments project their size (critical mass) and a decentralized structure. Thus, they are not limited to specific educational organizations. In such environments, cloud e-learning is more applicable than institutional or personal e-learning environments.

2. About virtual identities

A unique set of structured information and related metadata describing a person as a student or a teacher is the first step to create a virtual identity. Virtual identities help us to realize our existence into virtual spaces, work as vehicles for interaction within the virtual world and currently it is the only way to start socializing with others. Participants create their own user profiles and provide personal and contact information, interests, courses, finished projects, communities and groups they belong, etc. A virtual identity or e-identity does not necessarily corresponds 100% to the physical identity of the user, neither this is the reason to be wished for. In very simple forms a virtual identity consists of only a nickname (pseudonym) and a password, used for user authentication. The use of pseudonyms to enter specific social networks is not a new concept. As Kokswijk noted 2.500 years ago people used pseudonyms to be anonymous and up to recent years it is common to artists, criminals and some peers to create and use pseudonyms for their actions (2008).

VLE participants who already have a virtual identity and community membership confront an information space that looks infinite and diverse. VLE designers do not always pay much attention in creating to their users the feeling of 'home'. In most virtual environments users feel like 'homeless people walking around the streets'. This is crucial to the virtual identity subject because people seeing and socializing with others using an ID is not enough if there is no 'home'. Participants realize their identity if and only if there is a personal space or place of information that others cannot access without permission, it is fully controlled by them and customizable by their own preferences, just like they do with avatar appearance. In 3D immersive environments a home can be a virtual house or an apartment in a skyscraper. In non 3D online environments home can be a personal web page, or a wall of a

user profile. To make an analogy to physical life, home is a place where we have secrets, where we have privacy. We see, use, own things and behave away from other people's attention. We can invite friends and share this special place when we feel we trust someone. In most online social networks, when you are invited to be a friend to someone, you have access to (you are allowed to know) all other friends of that person. Some users do not feel comfortable by this feature because these social processes are not stepped enough and they are not always adaptive to different cultures. The same access rules apply to personal calendars, school projects, teamwork and grades.

Also, students who share the same virtual and social space prefer to create localities. Those localities can be a private virtual community or a small group of schoolmates sharing the same forum or chat room. Actually, it has been reported that relationships among members of social networks 'have the potentiality to grow faster than the absolute number of members' (Golbeck, 2007). These self-organizing communities create their own shared identities (Lombardi and McCahill, 2004). So, apart from the personal roots of virtual identities there is enough room for collective intelligence creation.

People may create virtual identities for personal use, for business or education. It is also very common that users create multiple virtual identities for the same services depending on the current social conditions. For example, a teacher may access Second Life to meet some students during working hours and later re-enter for personal use to chat with some friends. A categorization related to the scope of the visiting is listed below:

- create a new account, group, or event;
- for communication purposes (connecting people);
- participation in educational activities (lectures, online testing);
- reading, searching, filtering, downloading material;
- entertainment (videogames, make fun of new features);
- getting the latest news about community and events;
- update the profile, being popular, have a better reputation;
- check grades, active project status;
- participate in teamwork, share results;
- mixed (in most cases).

Also, more unconventional uses of virtual worlds have been found on the literature such as virtual church-going and religion practice (Kaburuan et al., 2009). In religious schools, academic and religious lives share a lot of common things.

A user may delete his/her virtual identity and restart from the beginning to form a new identity, or when the virtual identity was inactive for a long time and the system has been programmed to delete inactive accounts. Losing a virtual identity is actually losing proofs of the overall identity because the history of behavior (recorded interaction, privileges, list of friends) has gone and it needs time to recover reputation. In such cases, the loss is not related to personality, but to personal work of individuals. It is like an artist losing a part of his/her portfolio. The artistic talent is not reduced, but some proofs of this talent have been lost forever.

The virtual identity of a student or a teacher is a part of the person's identity. To be more specific, the sense of the virtual identity, as a matter of appearance, behavior and socialization, is the part of an individual's total sense of the identity that is under conscious control and allowed to be observed by others in a virtual world. The level of this control gets into question in many cases where ready-made procedures and technical restrictions create certain limitations in the user's freedom to create a more complex identity and history of behavior. For example, a free dress code may be the result of ready-made appearance models and not the result of user's free choice. Talking about social visibility in VLEs, Cameron and Aiwa (2008) found that the history of behavior is not strongly related to individuals' reputation. Especially for less popular individuals, their behavior has little impact on their reputation. So, can a new virtual identity make the difference? Before any attempt to answer the above question, the Identity Cloud concept should be taken into account because there is more room for identity experimentation.

3. Identity cloud

In specific social situations of everyday life we manage multiple selves and so we do in virtual social environments because of the extensibility of this multiplicity (McArthour, 2008) (Turkle, 1997). Also, a lot of people consider the creation of multiple virtual identities as an act of expanding their personality. Although the decentralization of personality in multiple virtual environments is a doubtless fact, the infinite multiplication is more like an illusion. A physical identity can only produce a set of user actions in the virtual world. When user's input (a set of actions) is combined with the system-driven actions performed by the virtual world algorithm, the result is a new unique virtual identity. It should not be confusion between identity and personality. Even a continuous creation of unique virtual identities by the same person could not be considered as multiplier of personality. Not to mention time constrains, the concept of personality goes beyond the scope of this paper.

In a closer look of the relation between a physical person and a virtual world, the virtual world is a system (a device or an algorithm) that processes a signal. That signal is triggered by a user action initially to create and later to control a new virtual identity. When a user creates a new account, the input of the system is a default or empty virtual identity dVI(n) as the result of a call to the default VI constructor.

Input: dVI(n) $\rightarrow$ [Process by virtual environment T] $\rightarrow$ VI(n)=T[dVI(n)] : Output

The output of the overall process is a new virtual identity expressed as: VI(n)= T[dVI(n)] and it is an expression of the distortion of input dVI(n) by the virtual world's internal processes T[x] which includes the other members' history of behavior. As examined earlier, dVI(n) is also dependent to the HCI of the system. Thus, the same person cannot create exactly the same virtual identity on any other virtual world. The reverse is also true: a given virtual identity cannot be identical to any other in the same or different virtual world. The combination of an individual's physical identity and the behavior expressed by

the same person using the specific communication and personalization tools of the virtual world is responsible for modifications over the default VI and thus the creation of a new virtual identity.

This system is linear because if we multiply the input signal by a factor k, then the output will be multiplied by the same factor, thus: $T[k \cdot x(n)] = k \cdot T[x(n)]$. If we double the time or effort of creating a new VI, then the result (a more processed VI) will be doubled too. For example, if a user spends k time for modifying the default (1 unit) virtual identity, then the result will be equal to k times the default virtual identity (k units) and thus closer to the user's preferences and behavior. But in most cases, users have multiple VIs where:

$T[a \cdot x1(n) + b \cdot x2(n) + \ldots + k \cdot xi(n)] = a \cdot T[x1(n)] + b \cdot T[x2(n)] + \ldots + k \cdot T[ik(n)]$.

This is a set of i virtual identities, each one processed by the same person using different actions and for various times. If we extend the same reasoning for many virtual identities living in many virtual worlds, then the 'Identity Cloud' concept is introduced in VLEs.

An individual might have multiple personae in the physical world depending on the environment (home, work, sports) and many virtual identities for use in virtual worlds. But an avatar may be under control by different users who change roles. Thus, there is a many-to-many relationship between physical and virtual identities (Brooke et al., 2004). People who create and maintain virtual identities pay effort to keep them all updated. Normally, different virtual identities share common information to shade the same person, but the transferring of information from one to another is limited because of platform compatibility issues and variations in the social context of each virtual environment.

Even though the use of multiple identities is a part of the typical human behavior and it follows naturally our normal mental changes, the cloud of virtual identities sooner or later will create mental conflicts. For example, the physical appearance is not being affected by aging and this time-proof ideal representation of self is soon being estranged with the way we see ourselves (Bowman, 2009). This may lead individuals to a continuous conflict managing and solving procedure in order to achieve a dynamic balance in the way they see themselves and are perceived by other members of the virtual environment.

4. Massively multistudent online VLEs

When users of academia are invited to share a common virtual space, strategies need to be developed to eliminate the phenomenon of empty and boring VLEs. The effectiveness of VLEs is also analogous to the frequency of their use. When rarely used, they become frozen environments with low importance. Researchers propose the structured information space, careful learning activities design and motivation as ways to avoid the phenomenon of 'Virtual Ghost Town' (Kapp, 2009). Richardson & Turner came to the conclusion that students feel less part of a learning community and among other solutions they propose the more successful use of the courserooms (Richardson and Turner, 2000). In addition to this, a courseroom can be successful

only if participants allow themselves to be part of the social context of the VLE sharing the same group identity in virtual communities apart from their personal virtual identity. There are massively multiuser virtual environments like Google Apps or Second Life islands, which offer the ability to conduct teaching and learning activities and users have the most control on this.

But what kind of learning can take advantage of those environments? In Cloud eLearning Environments control and content management is decentralized and not owned by any school or educational institution. They are neither teacher-driven nor student-driven. They are big autonomous systems which offer cloud based e-learning services to users of equal access and privileges over heterogeneous sources. If they achieve a critical mass (in absolute number of unique users) they become places of interest not only for students and teachers but also for researchers from social sciences, physiology and social engineering who want to study educational, social and behavioral phenomena in large scales. To make an analogy, Massively Multistudent Online environments do not consist of one huge courseroom each, but of a cloud-based services set for formal and informal learning. Instead of an infinite learning space, a structured set of virtual sub-communities is proposed to preserve high motivation and to let users develop a collective intelligence. We should not forget that the story metaphor is missing from virtual worlds if they are not games. Instead of premade scenarios, users are free to write their own stories inside virtual communities.

The identity perception in big groups is quite different. Initially, participants are expected to spend an important part of their time knowing each other and trying to be self-organized in communities than spend time in actual learning activities. Also students develop managing and promoting strategies to make their virtual identities famous among their communities. Visual customization can be applied on clothing, cosmetics, gender, body or even face morphing. It is known that teens like to experiment with different identities even in real life. But why someone should spend time and effort to create his/her user profile and share identity to others if he/she is already known in a community of physical world? Physical identities and existing social structures are the most difficult elements to be transferred in a virtual world, keeping at the same time the proportions of real world.

Rosen imply that some networking sites follow structures that by definition create self-centered worlds where narcissism and isolation predominate over sociability and this is the darker side of social networking (Rosen, 2007) (Ritter, 2010) Those structures, found on Facebook and Myspace, either attract narcissistic persons or strengthen the narcissism during the recreation of ourselves leading to an "identity enclave" culture.

5. **New quests for online academic life**

VLEs of the first generation were created around databases of learning material. Their primary use was the massive downloading of educational resources and most of the forum discussions were moving around technical issues regarding access difficulties, identification processes and information exchange

about 'who is teaching what'. Rules and processes forced students to follow specific behavior routes and thus VLEs were perceived as major downloaders.

Today VLEs are based on learning objects and metadata to deliver information and integrated learning services in a structured way. Students have access to multiple learning resources and under the support of the instructor they participate in content creation to make possible independent learning (Graham, 2005). VLEs are no more simple communication tools or major downloaders, they are 'spaces for negotiation' (Dillenbourg and Baker, 1996).

There is not enough space for real personalization in content and processes as VLE designers argue. Personalization is not restricted to personal profile settings, not to user driven responses of the system based on database queries. The high degree of integration of personalization into VLE should form learning services for specific personal goals. The lack of personalization on learning services drives content creators to make assumptions based only on curricula and teachers to recall their previous experience before even meeting their students and know their needs. Most virtual courses are introductory courses in IT skills because the learning content and activities are easier to be addressed (Koskela et al, 2005).

The forthcoming generation of VLEs has new aspects, introduce new technologies and new quests. A new holistic design philosophy should take into account that we learn from whatever we do in our everyday life. Knowledge, abilities and personal aesthetics are cultivated from our experiences (Korn-Bursztyn, 2002). In virtual environments students may engage in roles and communities totally different than in real school. In online life users interact not only with each other, but also with autonomous intelligent agents. Those software pieces are equipped with social learning skills and Kokswijk wonders if they deserve personality and how can we address legal problems related to their existance (2008). Matei et al. support that virtual and real spaces are not mutually exclusive and the social life of all virtual reality environments is a hybrid artifact (Matei et al, 2007). Similarly, students get involved in traditional and virtual learning experiences using hybrid identities and this is a way to construct a meaning about themselves (Williams, 1998). A critical theory is needed to explain how the student operates both on the VLE and within the VLE mainly because the 'third-person perspectives allow the player to exist within the gaze as the object rather than the agent of perception' (Taylor, 2003). This critical theory should also answer the following questions: What meanings are created from VLEs to imply that virtual learning is equally important as traditional learning? What meanings students construct about themselves living a part of their school life into virtual environments? Titman (1994) has shown that children have common reactions to specific meanings because they receive messages from the learning environment which is translated into a common cultural framework. In VLEs technology and culture are affecting each other in a primitive way.

6. **Discussion**

VLEs create learning spaces where distant students and teachers collaborate with each other in order to reach their goals in a less socially structured or differently structured environment. Virtual identities are the vehicles to follow personal routes in virtual schools life. The masking behind virtual identities has certain effect in high symbolic values. For example, the transactional distance, that is the feeling of students being close to their instructor, is eliminated (Coopman, 2009).

Some of the user accounts may stay incomplete and never achieve to be related to a complete identity, some others will be forgotten by their own creators, or they may continue to 'live' in an autopilot mode interacting only with the Artificial Intelligence of the virtual world. In any case, their values (whatever values will be) will be progressively decayed if now continiously supported. The rest will continue to consume an important part of the user's time. The only surely common thing among the pieces of Identity Cloud will be the 'time logistics' applied by the user. Bowman (2009) distinguishes two types of identities: 'chosen' and 'forced' identities, the later as 'a result of our necessary interactions with a range of mediated systems'. This plethora of virtual identities creates an 'Identity Cloud' to encircle participants who are called by the cloud to live in parallel realities and consume an important part of their everyday life supporting their online reputation. This is in line with the results of Charies about stress related to social networking and virtual identities: The most active users (those with the most contacts) are people who invest most time contacting others, making new online friends and are the ones more stressed (Charies, 2011).

Virtual learning communities are about sharing experiences, not just information and communication messages. Generally, we should not have over-expectations from the use of VLE. But, to be perceived by participants as socializing environments MMOCLEs need to allow participants to create complex virtual identities, express their feelings, wishes, level of satisfaction or complains and apply personal rules in owned information and processes. Cloud e-earning services can maximize their educational expectations if the participants can experience virtual or mixed academic life in a holistic way. Those mental images of the forthcoming next generation of VLEs will affect the future use of social networking for educational purposes in a positive way by creating personal memories, routes and expectations.

References

1. Arminen, I., Koskela, I., and Vaajala, T., *Configuring Presence in Simulated and Mobile Contexts*, Proceedings of the 11th Annual International Workshop on Presence, Padova, 129-136, 2008.
2. Bowman, S., *Presence, Identity, and the Cloud of Knowing*, E-learning politics and society, 2009. http://www.education.ed.ac.uk/elearning/ gallery/ bowman_presence.pdf.
3. Brooke, P., Paige, R.F., Clark, J.A., and Stepney, S., *Playing the Game: Cheating, Loopholes, and Virtual Reality*, ACM Computers and Society,

2004.

4. Cameron, A., Aiwa, S., *Are Individuals' Reputations Related to their History of Behavior?* Journal of Personality and Social Psychology, 94 (2), 320-333, 2008.

5. Charies, K., *Facebook 'Friends' Cause Stress*, BBC, 2011, http://www. bbc.co.uk/news/uk-scotland-edinburgh-east-fife-12479660.

6. Coopman, S. J., *A Critical Examination of Blackboard's e-Learning Environment*, First Monday, 14(6), 2009. http://firstmonday.org/htbin/ cgiwrap/bin/ojs/index.php/fm/article/view/2434/2202.

7. Dillenbourg, P., Baker, M., *Negotiation Spaces in Human-Computer Collaborative Learning*, Proceedings of the International Conference on Co-operative Systems, Juan-Les-Pins, France, 187-206, 1996.

8. Garrison, D.R., Kanuka, H., *Blended Learning: Uncovering its Transformative Potential in Higher Education*, Internet and Higher Education 7, pp. 95-105, 2004.

9. Golbeck, J., *The Dynamics of Web-based Social Networks: Membership, Relationships, and Change.* First Monday 12, 2007. http://firstmonday.org/ htbin/cgiwrap/bin/ojs/index.php/fm/article/view/2023/1889.

10. Graham, C. R., *Blended Learning Systems: Definition, Current Trends, and Future Directions*, In C. J. Bonk and C. R. Graham, (eds): Handbook of Blended Learning: Global Perspectives, Local Designs. San Francisco, CA, 2005.

11. Kaburuan, E.R., Chen, C.H., and Jeng, T.S., *Service Design Model of the Online Virtual Church in Second Life*, Proceedings of Computer-Human Interaction, Leiden, the Netherlands, 9-11, 2009.

12. Kapp, K., *Avoiding the Virtual Ghost Town*, eLearning-Learning Community, 2009, http://karlkapp.blogspot.com/2009/05/avoiding-virtual-ghost-town.html.

13. Kokswijk, J.V., *Granting Personality to a Virtual Identity*, International Journal of Human and Social Sciences, 3, 523-531, 2008.

14. Korn-Bursztyn, C., *Scenes From a Studio: Working With the Arts in an Early Childhood Classroom*, Early Childhood Education Journal, 30, 1, 39-46, 2002.

15. Koskela, M., Kiltti, P., Vilpola, I., and Tervonen, J., *Suitability of a Virtual Learning Environment for Higher Education*, Electronic Journal of e-Learning 3(1), 21-30, 2005.

16. Lennon, J., Maurer, H., *Why it is Difficult to Introduce e-Learning into Schools and Some New Solutions*, Journal of Universal Computer Science, 9, 1244-1257, 2003.

17. Lombardi, J., McCahill, M. P., *Enabling Social Dimensions of Learning Through a Persistent, Unified, Massively Multi-User, and Self-Organizing Virtual Environment, Conference on Creating, Connecting and Collaborating through Computing*, Kyoto, Japan, 166-172, 2004.

18. McArthour, V., *Real Ethics in a Virtual World*, CHI 2008, Florence, 2008.

19. Matei, S. A., Miller, C., Arns, L., Rauh, N., Hartman, C., and Bruno, R., *Visible Past: Learning and Discovering in Real and Virtual Space and Time*, First Monday, 5, 2007. http://firstmonday.org/htbin/cgiwrap/bin/ojs/ index.php/fm/article/view/1836/1720.

20. Richardson, J. A., Turner, A., *A Large-scale 'Local' Evaluation of Students' Learning Experiences Using Virtual Learning Environments*, Educational Technology & Society, 4, 108-125, 2000.

21. Ritter, T. *Walking the Line Between Virtual and Reality: Social Media and Self Identity*, 2010. http://www.unc.edu/~etritter/virtual_self.pdf.

22. Rosen, C., *Virtual Friendship and the New Narcissism*, The New Atlantis Summer, 15-31, 2007.

23. Taylor, L., *When Seems Fall Apart: Video Game Space and the Player*, the International Journal of Computer Game Research, 3(2), 2003. http://www.gamestudies.org/0302/taylor/.

24. Titman, W., *Special Places, Special People: the Hidden Curriculum of School Grounds*, Southgate Publishers, Winchester, 1994.

25. Turkle, S., *Life on the Screen: Identity in the Age of the Internet*, New York, Touchstone, 1997.

26. Williams, L., *What Constitutes a Good Learning Environment? Past Ideas and Current Trends in Sweden*, Proceedings of International Symposium Architecture, Child and Education, School of Architecture, Thessaloniki, Greece, 135-156, 1998.