

# **Multi-user game environments and collaborative constructivist didactics**

**An approach to using computer games in higher education**

Master thesis

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## Introduction

Whether emphasizing implicit ideologies or explicit competencies, over the past years a number of researchers have been analyzing specific educational qualities of several computer game genres (Michael & Chen 2006; Gee 2004; Herz 2002). Game developers and researchers Michael and Chen have even used the term 'serious games' to denote games that are developed with an explicit educational goal (2006). Such an emphasis calls for an investigation into the use of serious games in higher education. Consequently, my research into existing (serious) games and game environments has led me to writing this thesis, in which I explore the question of how computer games can be used within the educational practices of Dutch higher education.

As part of the initial research, conducted during an internship, ludological and narratological analyses of two serious games revealed an emerging heterogeneous genre of games, where developers upheld different pedagogical principles. Arguing for the use of computer games in higher education therefore requires scrutinizing pedagogical principles. First and foremost, this thesis upholds that the didactics, or formal educational practices, of higher education should not entail transferring knowledge from teacher to student. Instead, the thesis exemplifies collaborative constructivism by combining comparable theories upheld by several psychologists, pedagogues and game researchers. Such a process-based and learner-centred pedagogy favours experiential, critical and reflective learning in a social context.

Thus, pedagogy forms the distinctive basis of the conducted research, contrary to the aforementioned previous research on educational computer game genres. As technological pedagogues Garrison and Anderson have argued, this should be the preferred method of analyzing the use of any technology in education (2003). Indeed, calling for the use of computer games in higher education constitutes an endeavour that 'should be built on a deeper understanding of how people learn, how new tools support and assess learning gains, what kinds of organizational structures support these gains, and what is needed to keep the field of learning moving forward.' (US Web-based Education Commission in Garrison & Anderson 2003, 2-3)

Furthermore, the thesis explores several formal educational practices upheld in Dutch higher education. By examining didactics, the thesis focuses on the 'micro' curricular level, representing the level of course-specific learning goals, teaching methods and content (Van Boxel, Schoonenboom & Jansen 2004). Indeed, the thesis shows that traditional didactics do not necessarily reflect collaborative

constructivism. As Garrison and Anderson have argued, adopting collaborative constructivist didactics in higher education allows for a specific use of technology.

This thesis therefore theorizes on the use of multi-user game environments in higher education, as a specific form of computer game technology. As part of the conducted research, several multi-user game environments were analyzed, namely Second Life, Active Worlds and Neverwinter Nights. Previous knowledge of World of Warcraft is applied as well. Several technologies within these multi-user game environments are compared to principals of collaborative constructivist didactics. Focusing on the communal, situating and critiquing capabilities of multi-user game environments, similarities are signalled between collaborative constructivist didactics and this specific form of computer game technology. Thus, the thesis finally argues how a didactic multi-user game environment incorporating all these specificities can be used in, as well as enrich, collaborative constructivist didactics in higher education.

# Process-based experiential pedagogy

## The human brain

Questioning how to use multi-user game environments in higher education requires research into the principals adopted in higher education. Specifically, didactic and pedagogical principals, representing respectively formal educational practices and learning theories, need to be analyzed and scrutinized. At the core of any learning theory lies an array of suppositions regarding the workings of the human brain. This chapter sheds light on some of those suppositions, drawing from cognitive science, cognitive psychology and pedagogy. Subsequently, I argue for the adoption of collaborative constructivism in higher education, as a form of process-based pedagogy that reflects advances in cognitive science and psychology.

In his analysis of how different sciences have classified the human brain, psychologist Norman denounces a unitary and disembodied view of intelligence, as an intelligence 'isolated from the world' favouring 'pure reason' (1993, 146). He calls for a different approach, favouring a social and experiential view of intelligence. The sophisticated human mind should be capable of 'representing first knowledge and then metaknowledge' (119), forming and comparing knowledge representations to provide 'causal explanations of the events of the world'.

When psychologist Gardner researched the concept of human intelligence, he equally noticed how the traditional sense of intelligence only considered a capacity for thought and reason (1999). As pedagogue Smith states, such suppositions resulted in product-based pedagogy, favouring a quantifiable change in behaviour or increase in knowledge as a result of learning (1999). In the course of the 20<sup>th</sup> century, biological and cognitive sciences provided an increased understanding of the human brain, where the human mind is considered as 'a series of relatively separate faculties' (Gardner 1999, 32).

Emanating from new scientific research that began to map out the human brain, Gardner rejected a unitary connotation of human cognition. Indeed, as researcher Dalgarno states, such a rejection was largely warranted by cognitive psychology, a field of study that no longer viewed the human brain as unfathomable, but actively pursued an understanding of its inner workings (1996). Previously, behaviourism, as a philosophical presupposition, considered human behaviour as definable. Thanks to scientific research, cognitive psychology considered that the human brain as the source of all types of human behaviour is indeed definable. Thus, cognitive psychology undertook an understanding of a 'diversity of human abilities' (Silver, Strong & Perini 2000. 6), based on the realization that such abilities emanated from different parts of the human brain.

## What to learn

Rejecting the unitary connotation of human cognition as well as the quantification of intelligence, Gardner introduced a new definition of intelligence, stating intelligence as 'a biopsychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture' (1999, 33-34). By 1995, Gardner had introduced eight different intelligences based on this new definition and drawing from biological and cognitive sciences as well as psychology.

Each person is equipped with all of these intelligences, with a 'unique blend', which can be exhibited according to one's 'own inclinations' and 'culture's preferences' (44). Thus, they are not static, but can be developed individually. Furthermore, Gardner categorically denounces morality in any of the intelligences, as they can equally be put into a 'constructive or destructive use'. Gardner recognizes that a learner's environment, as well as his or her personality, influences the developed intelligences. Thus, intelligence is indeed never isolated, nor founded in pure reason, as psychologist Norman argued.

Theoretical linguist and game researcher Gee uses the term 'semiotic domains' (2003, 17) to denote different disciplines, in which knowledge is constructed socially, actively and critically. Stressing the importance of situated meanings, Gee signals that knowledge is always tied closely to the semiotic domain in which it is constructed, applied and critiqued (18). Furthermore, he recognizes an existence of different 'literacies' (14), seen as consuming and producing meaning situated within semiotic domains 'connected to social practices' (17) that are deemed important in that domain. Such literacies entail more than reading or writing in a literal sense, such as 'different types of "visual literacy"' (13), as well as other literacies 'beyond print' (14). Gee's emphasis on the importance of consuming and producing meaning within a semiotic domain, as a specific culture or environment, is tied closely to Gardner's emphasis on combinations of multiple intelligences preferred within different cultures.

Gardner's categorization of multiple intelligences, as well as Gee's closely related conceptualization of multiple literacies, helps define what is to be learned in higher education. A complete process-based pedagogy for higher education should also define how this is to be learned. With a distinction between internal and external views of semiotic domains, Gee offers a conceptual basis for signalling different learning styles within various disciplines. However, pedagogues Silver, Strong and Perini, as well as Kolb, have researched learning styles more explicitly, shedding light on how a person learns.

## How to learn

Based on psychologist Jung's work in 1923, several academic pedagogues have developed categorizations of learning styles as personality types. As Silver, Strong and Perini have argued, human personality according to Jung is derived from two cognitive functions: 'perception (how we absorb information), and judgment (how we process the absorbed information)' (21). Based on that assumption, psychologist Myers introduced the Myers-Briggs Type Indicator (MBTI), that forms the basis for the categorizations of learning styles by Silver, Strong and Perini, as well as a conceptual reflection for Kolb.

In the MBTI, Sensing and Intuition represent perceptual styles, while Thinking and Feeling represent judgmental styles. Similarly, Kolb uses a distinction between Concrete Experience and Abstract Conceptualization as styles of perception, as well as Active Experimentation and Reflective Observation as styles of judgement. Where Myers upholds a cognitive basis complemented by a preference for experiential learning, Kolb emphasizes an experiential basis, stating that cognitive learning theories 'tend to emphasize cognition over affect [sic]' (Kolb 1999, 2). Thus, Kolb adopts an experiential learning theory, where learning is defined as 'the process whereby knowledge is created through the transformation of experience'.

Silver, Strong and Perini emphasize that an intelligence, as defined by Gardner, can be developed using one or more learning styles (2000). Moreover, in their discussion of subjectivity within theories of multiple intelligences and learning styles, the authors draw from critical theory and signal 'dispositions' (9) in both theories. A disposition towards one or more intelligences is culturally defined, where a person's environment may validate certain intelligences, or grades within an intelligence, throughout history or in education. Furthermore, certain learning styles may be validated within a person's environment as well (27).

Gee's emphasis on consuming and producing situated meaning within a semiotic domain, reveals that certain combinations of intelligences and learning styles constitute literacies. Drawing from critical theory, such dispositions for combinations of intelligences and learning styles within various disciplines correlate to constructivism and feminist theory, as philosophies that value subjectivism in various forms. The next paragraph discusses these philosophical principals and their application in pedagogy.

## **Constructivism and feminist theory**

Multiple intelligences, detailing what is to be learned, and learning styles, detailing how this is to be learned, provide combined an understanding of process-based experiential pedagogy in which the learner's experiences are exemplified. An understanding of semiotic domains as explicated by Gee, shows that within a specific discipline, certain combinations of intelligences and learning styles, or literacies, are preferred. Dalgarno deems such learning theories as constructivist, signalling a preference for not only cognitive psychology, as stated earlier, but for subjectivism, experiential methodology and a social context as well.

Constructivism as defined by Dalgarno rejects unitary and objective knowledge and embraces subjective knowledge representations. Thus, constructivism correlates well to Norman's view of the human mind as social and experiential, as well as Gardner's and Gee's cultural emphasis of human intelligence. Combined, theories of multiple intelligences and learning styles provide an insight into what a subjective knowledge representation would entail. Moreover, constructivism favours an experiential methodology, where signalling discrepancies between one's own knowledge representations and one's experiences is exemplified. Experiential methodology is closely linked to a preference for a social context, where knowledge representations are best constructed in a group setting.

Similarly to constructivism, feminist theory favours subjectivism as well. Moreover, feminist theory questions paradigms, 'calling into question previously held beliefs and ideologies' as feminist pedagogue Jackson states (1997). Thus, feminist theory denies objectivism categorically. Feminist theorist Humm refers to an essential difference between constructivism and feminist theory, when stating: '[t]he whole point of recent feminist theory is not to construct a theory of knowledge but to put forward a series of methods for examining the production of knowledges' (Humm in Jackson 1997). Thus, feminist pedagogy upholds a dedication to difference and experience, connecting intelligences strongly to learning styles when signalling disciplinary dispositions.

It seems that Dalgarno's definition of constructivism includes feminist theory, rejecting objectivism and embracing experiential methodology strongly. Similarly to Dalgarno, technological pedagogues Garrison and Anderson refer to constructivism, preferring a subjective understanding of knowledge representations, an experiential methodology and a social context. They introduce the term collaborative constructivism to denote their pedagogical concept. Preferring an influence of feminist theory, I will uphold the term collaborative constructivism to denote a process-based pedagogical concept based on subjective knowledge representations, experiential methodology and a strong social context.

Within collaborative constructivism as defined by Garrison and Anderson, critical and reflective thinking is of great importance. For Gee, critical thinking entails being able to consciously 'attend to, reflect on, critique, and manipulate' principles or suppositions within a semiotic domain. A learner 'must see and appreciate the semiotic domain as a design space' in terms of its contents as well as ways of 'thinking, acting, interacting, and valuing' within that domain, representing respectively internal and external views (Gee 2004, 40). Garrison and Anderson use a similar definition, though drawing from critical theorist Dewey's reflective thinking model, stating: '[c]ritical thinking both authenticates existing knowledge and generates new knowledge, which suggest an intimate connection with education.' (2003, 56) Indeed, I argue that within higher education critical and reflective thinking as hallmarks of collaborative constructivism is of the highest importance.

The experiential and semiotic bases of collaborative constructivism effectively demand a learner to situate him- or herself within a semiotic domain. A semiotic domain can only be understood completely if a learner develops the intelligences, as well as the learning styles it prefers, resulting in critical and reflective learning, instead of constituting critical and reflective thinking only. Indeed, critical and reflective learning demands an internal view of the semiotic domain first, accompanied by an external view subsequently (Gee, 98). Thus, true to principals of feminist theory, discipline-specific intelligences and closely connected learning styles are reflected upon.

As feminist pedagogue Freire states: 'all educational practice implies an educational theory' (Freire in Jackson 1997). If intelligence is indeed 'exhibited during a performance or problem-solving process' (Silver, Strong and Perini 2000, 7), a strong connection between process-based experiential pedagogy and like-minded didactics is favoured. Such didactics represent learning and learner centred formal educational practices encouraging the development of multiple learning styles and intelligences specific to the analyzed discipline. The following chapter examines some adopted didactic approaches in Dutch higher education and subsequently argues for the adoption of collaborative constructivist didactics, allowing for a specific use of multi-user game environments.

# **Learning and learner centred didactics**

## **Traditional didactics in higher education**

Similar to Smith, educationalists Standaert and Troch signal product- and process-based approaches in their accounts of general didactics. Preferring a person's use for society, product- or society-based didactics adopt a unilateral educational practice that emphasizes the educational system as provider of knowledge, competencies and diplomas (1998, 21). Such didactics indeed represent product-based pedagogy, by centralizing an objective view of knowledge and teachers as providers of knowledge. The following short analysis of product-based didactics is based on signalled learning goals, teaching methods and views of content.

By defining closed, operational and quantifiable learning goals, product-based didactics prefer a clear-cut increase in knowledge or change in behaviour as a result of learning (Standaert and Troch 1998, 39). Here learning is seen as simply 'passive-information-transfer' (Garrison & Anderson 2003, 4). Befitting product-based didactics, classic instruction is exemplified as a teaching method (Standaert and Troch 1998, 120). Within traditional higher education, the lecture is the best example of classic instruction. Instruction entails a mimic supposition of learning. A teacher shares knowledge and a subsequent test of some sorts determines whether a learner can reproduce the shared knowledge.

Mimetic product-based didactics entails a predisposition for content, as absolute and objective knowledge that is transferred. Educationalists thus order content in courses, where each course can uphold an entry level, detailing which courses a student should have taken priory (110). Moreover, the book, viewed as a continually perfected bearer of objective knowledge, is centralized (111). Yet, Standaert and Troch conclude that the centralization of an objectively viewed society as part of product-based didactics cannot be upheld categorically (106).

## **Collaborative constructivist didactics**

The previous chapter unveiled how cognitive psychology calls for process-based experiential pedagogy and like-minded formal educational practices. Standaert and Troch state that within process-based or personal didactics, the learner is once again centralized and the development of an individual's personality is favoured (22). Closed, operational and quantifiable learning goals are no longer definable. Instead, more open and expressive learning goals, describing an encounter, situation, problem or simply a task need to be defined (46-7). Indeed, defining such open learning goals that centralize the learner, as part of process-based didactics, reflect process-based experiential pedagogy.

End results from a learning experience reflecting process-based didactics are heterogeneous in nature. Thus, results should be continuously signalled and assessed during a learning experience. Teaching methods explored by Standaert and Troch as reflecting process-based didactics are therefore aimed at continuous assessment of personal development (128-9). Such assessments emphasize the development of capabilities and skills, forming the pedagogical basis. Working groups, in which learners discuss issues critically and reflectively, form the best example of process-based didactics within higher education. Furthermore, practical experience periods or internships form examples of other teaching methods.

Technological researchers Garrison and Anderson emphasize in their concept of collaborative constructivism that the interaction between the values of society and one's personal interests and experience is of great importance when formulating an educational practice (2003). Thus, in order to provide meaningful education based on collaborative constructivism, the distinction between product- and process-based didactics needs to be blurred. In this context, Garrison and Anderson appreciate a 'shared understanding' (22), in which a 'community of inquiry' (25) engages in an educational experience, comparing individual and shared understandings of society (23). Similarly, Gee uses the term 'affinity group' (2004, 192) to denote such a community that researches situated meanings within a specific semiotic domain, or discipline. Garrison and Anderson argue that '[a] critical, collaborative learning community has been the sine qua non of higher education.' (2003, 22) This warrants an in-depth investigation of educational practices that instigate a community of inquiry.

Arguing for a different use of e-learning technologies in higher education, Garrison and Anderson introduce a distinction in presences to elaborate on an educational practice that reflects collaborative constructivism. As explicated earlier, collaborative constructivism represents process-based experiential pedagogy, which in turn is based on an in-depth understanding of the learning human brain. The distinction in presences is a helpful tool for applying this pedagogical concept in an educational practice. By signalling social, cognitive and teaching presences among all members of an educational experience, both teachers and students alike, a community of inquiry is instigated. In such a community, meaning is constructed experientially and independently, yet refined and confirmed collaboratively (23).

Although Garrison and Anderson apply their distinction of presences to text-based e-learning environments, I argue that they are equally applicable to multi-user game environments. The following paragraphs provide an ontology of multi-user game environments, revealing pedagogical and didactic qualities that reflect collaborative constructivism very well.

## Defining a MUGE

The preference for the term multi-user game environments (MUGEs) stems from connecting different specificities of closely related massively multiplayer online role-playing games (MMORPGs) or the broader massively multiplayer online games (MMOGs). Often more simply referred to as virtual worlds, such computer generated representations of basic elements of physical reality, such as nature, culture and the human body, deserve a further investigation.

In his history of MMOGs and MMORPGs, Kent states that such computer games should entail a graphical and persistent representation of a world, in which multiple users can roam using a (broadband) Internet connection (2003). In other words, the virtual world should be continually available to anyone who has the required computer power and Internet connection. The term multi-user game environment adheres to these basic technical conditions.

By definition, a MUGE should induce a sense of 'worldliness' (Kelly 2004). Considering definitions of worldliness, virtual and world, multimedia teacher Kelly writes in a critical reflection how he and his students tried to signal conditions a virtual world should meet if it is to be deemed as such. Kelly concludes that a virtual world should have the 'efficiency' of a world. Where the physical world denotes 'worldhood', as a function of the world itself, a virtual world denotes 'worldliness', as a function of perception. Thus, worldliness is a subjective concept, sensed by players.

Kelly concludes that a virtual world should indeed be persistent, in the sense that it should run continually regardless the presence of users. Subsequently, it should induce a feeling of presence among its users by initiating user-user and user-world interactions. Thus, although a virtual world should be persistent, without active user interaction on multiple levels it cannot be deemed as a true virtual world. In these interactions, players can experience a sense of worldliness, if the virtual world can be subjected to a characterization. Apparently, a virtual world needs to be thematic, or perceptually cultural. Only then can users, interacting with each other and the world, learn and extend this culture. As Kelly concludes: '[t]he presence of a learned culture, being contended and extended, is what gives a place its specificity, and makes it what it is and not what it is not.'

Game researcher Kjastrup seems to concur with Kelly when analyzing specific types of virtual worlds. One of the major functions of a virtual world 'is that of providing a stage for an experience of shared lived world', Kjastrup states (2003). It seems that a sense of learned culture is an 'aspect of being in the world, which is related to the experience of time, history and community development within the world'. A virtual world needs to explicitly accommodate an social learning

experience to induce a sense of worldliness and subsequently be deemed a virtual world. In effect, experiential pedagogy is an obligatory principal of a virtual world.

Game researcher Juul seems to concur as well. Interacting with other users and with the world entails negotiating a full representation of the world socially, according to Juul. He prefers the term 'fictional world', instead of virtual world, denoting a demarcation from physical reality only. The preference for the term 'fiction' stems mostly from a previous debate discussing the use of ludology and narratology in computer game studies<sup>1</sup>. Moreover, fiction seems to denounce a categorical denial of reality that the term 'virtual' connotes, by focusing on physical reality only. Juul applies the concept of fiction to denote that fictional worlds offer 'incomplete information'. As an overall picture of the complete world is unattainable, Juul states that some information 'will be filled in by the user, some of which will remain subject to controversy' (2005, 122). Thus, a sense of worldliness is signalled by user-world and user-user interaction, in which players cognitively and socially complete the incomplete information constituted by the perceptual representation of the world. Learned culture, as a necessity for a virtual world, is signalled by a world's users who contend and extend culture in a social context.

### **Didactic qualities of a MUGE**

Juul provides an insight into several elements of the perceptual representation of a virtual world, constituting incomplete information as a basis for learned culture. However, where Kelly and Klastrup focus on essences of virtual worlds, Juul expands the object of research by examining game worlds. Therefore, he sheds light on different rule structures within the fictional world that also help constitute a sense of worldliness.

Indeed, a game world implies more than a virtual world. As Kelly states: 'games are task-based or goal-oriented in a way that the world is not.' (2004) In her discussion of specific types of virtual worlds, Klastrup signals ludus and paidea, as respectively 'more strict gaming aspects of the world' and 'pretence play or conscious performing' (2003). Juul attributes these elements to different rule structures. For Juul, rules represent 'limitations and affordances' (2005, 58), presenting players challenges and ways to overcome those challenges. Together, they 'give games structure'. Games of progression 'directly set up each consecutive challenge in a game', whilst games of emergence 'set up challenges indirectly because the rules of the game interact' (67). Thus, emergence, or paidea in Klastrup's view, is instigated by open rules that enable a multitude of player

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<sup>1</sup> According to Frasca, this debate 'never took place' (2003), as there were neither recognizable opposing positions, nor identifiable opposing scholars, of what computer game studies should entail. Therefore, ludology and narratology as methods of analysis can and should be combined in computer game studies.

actions. Progression, or *ludus* in Klastrop's view, is instigated by closed rules that individually allow for only a limited number of actions, or even a single action.

Within game worlds, Juul states that rule structures instigating progression and emergence can be signalled simultaneously. A MUGE seems to correspond to Juul's concept of 'coherent world games' (132), in which incomplete information is contended and extended by its users, constituting a learned culture. Emergence forms the absolute basis of such a world, although progression plays an important part as well. According to Juul, progression can induce user-user and user-world interactions, thereby reinforcing a learned culture and a sense of worldliness. Thus far, a MUGE has been defined as a audiovisual persistent representation of physical reality, inducing a sense of worldliness by applying rules instigating emergence and progression to provide a basis for learned culture.

Essentially, a MUGE seems analogous to a simulation of reality. Yet, simulation connotes a degree of realism that can be problematic. As Juul states, '[s]imulation can have varying degrees of fidelity to what is being simulated.' (170) Indeed, playing FIFA 2002, a simulation of soccer, does not entail learning soccer. Instead, the player learns a simulation of soccer, as 'an extreme simplification'. Juul concludes that any simulation removes 'detail from the source domain', allowing to 'focus on a specific idea of what the game is about'. A MUGE can equally provide a 'stylized concept of a real-world activity' (172), as a specific educational quality.

Gee states that a good computer game of any genre, thereby including MUGEs, provides opportunities to learn internal and external views of a semiotic domain. Such views unveil respectively a domain's content and ways people 'tend to think, act, interact, value, and believe' (2004, 28) within that domain. Connecting Gee to the concepts above, I argue that a stylized concept of a real-world activity, complemented by the presence of a learned culture and a subsequent sense of worldliness, thus induces active and critical learning.

In accordance with critical learning, a didactic MUGE allows users to contend and extend this stylized concept explicitly. A didactic MUGE for higher education offers a stylized concept of a real-world activity as a starting point. In accordance with reflective and critical thinking principles of constructivism and feminist theory, learners should be able to subsequently analyze and critique the stylized concept. By affording users specific tools to do this in a didactic MUGE, users become to an extent game world designers. The collaborative constructivist framework of Garrison and Anderson is useful for explicating what specific tools users should be afforded in a didactic MUGE. The next chapter connects the didactic specificities of collaborative constructivism and a didactic MUGE, shedding light on the practical application of both in higher education.

# Connecting didactic specificities

## A communal identity

According to Garrison and Anderson, collaborative constructivist didactics entail creating a community of inquiry, where the teacher provides a critical and reflective learning environment (2003). They introduce a collaborative constructivist didactic framework, which entails inducing and maintaining social, cognitive and teaching presences among all learners in the community. The following paragraphs explain which specific technologies of a didactic MUGE correlate well with these presences. By connecting these didactic specificities, an insight is provided into how a didactic MUGE can reflect and enrich collaborative constructivism in higher education.

Garrison and Anderson define social presence as the absolute foundation, as 'the ability of participants in a community of inquiry to project themselves socially and emotionally, as 'real' people (i.e., their full personality), through the medium of communication being used' (2003, 28-9). Thus, a social presence creates a level playing field for the entire community, where a climate is created that 'supports and encourages probing questions, scepticism and the contribution of more explanatory ideas.' (50)

To signal a social presence within a community of inquiry, Garrison and Anderson offer three 'categories of communicative responses'. An 'affective' communicative response is emotional, humorous or personal in nature and is viewed as essential to induce a sense of true equality and respect within the community. A response deemed as 'open communication' is a substantive response in which one learner relates to another on a specific issue. As such, '[i]t allows questioning while protecting self-esteem and acceptance in the community.' (52) Finally, a 'cohesive' communicative response entails, similarly to open communication, a relation to another learner, yet on a sociable level. Such a response helps to uphold the perception of a community among the learners.

All the aforementioned categories of communicative responses correlate well to Sutton-Smith's observations on play as a practice reinforcing communal identity. Within the textual e-learning environment as proposed by Garrison and Anderson, such communicative responses would not necessarily entail an activity that could be deemed as 'play'. Yet, as Garrison and Anderson admit, communicating 'socio-emotional content necessary for building a social community' (49) as perhaps being essentially non-verbal, is especially difficult within such an e-learning environment.

However, within a didactic MUGE, non-verbal interactions become available that can help instigate a social presence more easily. Creating a persona, better known as an avatar, a MUGE user creates a fictional bodily representation of the self, though no causal relations between the physical person and fictional persona

should be drawn per se. Such a persona is instead 'adaptable to each individual's prerequisites' (Manninen 2004, 113), allowing for non-verbal implicit interaction with other users via their own personas. Manninen states that aspects of a persona's appearance, as 'visual aspects of one's presentation', essentially are 'either static or dynamic communicational messages' to other users (112).

World of Warcraft, a popular MMORPG of the fantasy genre, allows players to choose personas by combining a fantasy race, class and appearance. Choosing a persona entails choosing in-world specific abilities as well as race and class history. Thus, users meeting each other within the fictional world know of each other's history and abilities to an extent, representing static communication messages. The way in which users represent their chosen persona's history and abilities more explicitly, yet still non-verbally, entails an affective or cohesive communicative response, or a dynamic communication message, instigating a communal identity.

Moreover, implicit interactions with other users within World of Warcraft are accompanied by explicit interactions with other users as well as the fictional world when its rule structures are engaged. Within World of Warcraft, the 'quest' represents a progression offering a challenge that can demand grouping of users in order to overcome it. In effect, such a quest demands play constituting a community. Different technologies are provided that help users in tackling a quest. Chat channels, either area or topic specific or available to everyone, offer users possibilities of finding other users that can help with a quest. Moreover, grouping users in different ways helps users in keeping track of the other users' whereabouts, strengths, skills and health.

Although very sceptic, Sutton-Smith recognizes that 'rhetoric' favouring a view of play as constituting communal identity is very prevalent (1997). Yet, Sutton-Smith's realization that such discourse is intrinsically ideological and positivistic, viewing play as 'a function of some other more important cultural process', instead of being an 'enjoyment' with both intrinsically positive or negative characteristics, is indeed noted (106). Thus, rule structures within World of Warcraft that, once engaged, induce communal identity forms a domain-specific and subjective view of play. Moreover, creation of a communal identity is seen as an effect of the explicated forms of play, not as an intrinsic element.

Within collaborative constructivist didactics in a broader sense, creating communal identity by inducing and signalling several communicative responses among learners can be helped by using specific communal technologies. The examples offered by World of Warcraft reveal that customizable personas, progressions, as well as group communication and group facilitation functionalities are necessary specificities of a didactic MUGE. They help initiate and uphold social presence among learners, as a crucial foundation of collaborative constructivism.

## Situating

Within the didactic framework of Garrison and Anderson, social presence is the starting point of a community of inquiry. Subsequently, a learner's cognitive presence is signalled through indicators of critical and reflective learning. Such indicators unveil a learner's capacity to construct meaning individually, as well as a capacity to confirm, reflect on and refine meaning socially. (2003, 28) Therefore, learners exhibiting a cognitive presence encourage an 'intellectual environment that supports sustained critical discourse and higher-order knowledge acquisition and application' (55). As such, intellectual autonomy, though thoroughly collaboratively constructed, is exemplified.

Garrison and Anderson offer four 'descriptors and indicators' (61) of 'practical inquiry' (58), based on Dewey's model of reflective thinking, that in effect combine models of both Kolb's experience-based and Myers' cognition-based learning styles. The 'triggering event' and 'exploration' descriptors of cognitive presence represent learning styles of perception that favour respectively experience and cognition (59). The triggering event constitutes 'a dilemma or problem that students could relate to from their experiences or previous studies as an experiential style of perception. Exploration constitutes group or individual activities, such as 'brainstorming' or 'literature searches', as a cognitive style of perception. Furthermore, the 'resolution' and 'integration' descriptors represent learning styles of judgment that equally favour respectively experience and cognition (60). Resolution entails 'reducing complexity by constructing a meaningful framework or discovering a contextually specific solution' by 'direct or vicarious action', as an experiential style of judgment. Integration entails 'a highly reflective phase', in which students engage in 'critical discourse that will shape understanding', as a cognitive style of judgment.

Gee argues that playing a good computer game requires players to situate themselves within a semiotic domain, obtaining both internal and external views of the domain, constituting active and critical learning (2004, 98). Indeed, a didactic MUGE constituting a learned culture and offering a stylized concept of a real-world activity, helps learners to actively seek and reflect on situated meanings. The role-play architecture of *Neverwinter Nights* sheds light on specific technologies that constitute situated learning. Similar to *World of Warcraft*, a player of *Neverwinter Nights* adopts a persona. However, within *Neverwinter Nights*, a persona's abilities is defined and developed more elaborately by class-specific feats, spells, as well as a character sheet that 'grades' several character capabilities. Playing *Neverwinter Nights* entails overcoming challenges constituted by different rule structures. It entails being a wizard, rogue or another persona in which you formulate and adopt strategies based on your persona's abilities.

When playing with a persona in *Neverwinter Nights*, a player learns to develop its abilities, similar to what game researcher Herz signalled (2002). Indeed, developing a persona in a multi-user setting makes a player 'emotionally invested in the statistical profiles' of the persona (186). Role-play represents situated learning, in which players invest emotionally in the various abilities of a role, exploring rule structures and subsequently defining strategies to develop those abilities further. The 'triggering event' and 'resolution' experiential descriptors of cognitive presence are thus clearly perceivable phases of role-play within a didactic MUGE. As such, role-play adds a significant and valuable experiential component to cognitive presence of collaborative constructivist didactics.

### **Critiquing and re-situating**

The role-play architecture of *Neverwinter Nights* shows that situated learning can be instigated experientially, by offering stylized concepts of the abilities of a semiotic domain's member. Furthermore, Gee signals critical learning within the context of a computer game explicitly when the computer game allows player customization. Building 'fan modifications', or mods, a player can customize her or his 'own learning experience' (Gee 2004, 194). Indeed, within a didactic MUGE, players should equally be 'insiders and producers', critically contending and extending the learned culture of the fictional world.

Such capabilities correlate well to the teaching presence of collaborative constructivism as explicated by Garrison and Anderson. As collaborative constructivism dictates equivalence of teachers and students, both being learners, 'students must have some influence on what is studied and how it is approached' (Garrison & Anderson 2003, 68). As such, a teaching presence is defined as 'the design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes' (29). Although Garrison and Anderson emphasize that social and teaching presences are facilitators of a cognitive presence as the essential learning process, they recognize that teaching presence encompasses both social and cognitive presences on a design level.

As with the other presences, Garrison and Anderson offer descriptors or indicators for a teaching presence as well. Firstly, 'instructional design and organization' is a descriptor in which a learner effectively helps to shape the educational experience in a way that will introduce effective responsiveness to developing needs and events' (68). Furthermore, 'facilitating discourse' entails helping maintain critical and reflective thinking by taking responsibility for 'not just a prescriptive dissemination of information' (69). Finally, 'direct instruction' entails

'diagnosing misconceptions', 'injecting knowledge' and asking questions that potentially help to instigate critical and reflective thinking (70-1).

Within Second Life, users collaboratively build areas by using in-world three-dimensional modelling technologies. Using basic three-dimensional shapes (or 'prims': primitives), users can create elaborate objects that extend the fictional world or a persona. Similarly, within Active Worlds, users can choose from and connect hundreds of thousands of pre-defined three-dimensional objects to extend the fictional world. Contrary to Second Life, these pre-defined objects are built out-world in other three-dimensional authoring software. Nevertheless, Second Life and Active Worlds are similar in how they offer users capabilities to build a setting. Moreover, both software products allow users to attach scripts to created objects, allowing for specific object functionalities and user interactions.

The explicit verbal or textual descriptors of teaching presence signal an environment for critical and reflective learning. Equally, the aforementioned building technologies of Second Life and Active Worlds allow users to create a setting that exhibits a teaching presence non-verbally. In effect, when learners collaboratively create a setting in a didactic MUGE, all of the teaching presence descriptors are clearly perceivable.

Within a didactic MUGE, role-play technologies like the ones of Neverwinter Nights, as well as building technologies like the ones of Second Life or Active Worlds are necessary specificities. Creating a new setting allows for subsequent re-situated learning, in which learners can reflect critically on the experientially developed alternate stylized concept of a semiotic domain. Ideally, the building technologies are user-friendly in a sense that they provide as little scripting knowledge of a learner as possible. As the following paragraph shows, Neverwinter Nights offers a unique building toolset that is in that sense more user-friendly, yet less rudimentary, than the building capabilities of Second Life and Active Worlds.

## **Using a MUGE**

Interestingly, Neverwinter Nights was used in US higher education at the University of Minnesota (Berger 2006). In a journalism course called Jour 3004 offered at the School of Journalism and Mass Communication, students need to 'master practical and conceptual skills' in the field of journalism. Using Neverwinter Nights, the two professors who coordinated the course concluded that '[g]ame simulations can offer a realistic world in which to 'practice' those practical and conceptual skills without risk.'

Thanks to an included building toolset, users of Neverwinter Nights can create new game environments, in which different buildings, computer-generated characters and event triggers can be put. True to form, this MUGE subsequently

allows multiple users to enter the created game environment, formulating strategies to overcome rule structures. The professors used the building toolset to create a fictional city called Harperville, where a train wreck had occurred, calling for users to become journalists reporting on the disaster in an article. Offered lots of information, i.e. background material and computer-generated characters, students had to formulate a strategy to overcome the assignment of covering and writing the story. The professors were equipped with extra capabilities to monitor a student's progress and to distil how a strategy was formed.

To an extent, this specific use of *Neverwinter Nights* represents collaborative constructivist didactics very well. Students are offered a learning experience that represents process-based experiential pedagogy, in which a student's progress is monitored continuously and product-based closed learning goals are denounced. Moreover, the learning experience exemplifies subjectivity, allowing users of *Neverwinter Nights* to formulate their own strategies to overcome specific challenges of journalism. Thus, the course offered a stylized concept of a real-world activity, i.e. being a journalist.

However, if the course were to reflect collaborative constructivism completely, students should be able to contend and extend the stylized concept as well. Thus, a similar course representing critical and reflective learning more explicitly could provide students with access to the building toolset of *Neverwinter Nights*. Equipped with capabilities to redefine the rule structures that help to create a stylized concept of journalism, students can experiment with the experience of being a journalist even more critically and reflectively.

## Discussion

The communal, situating and critiquing capabilities of a didactic MUGE reflect the social, cognitive and teaching presences of collaborative constructivism. These critical capabilities offer an insight into how a didactic MUGE can be implemented in a collaborative constructivist didactic setting practically. As a summary, a didactic work flow is given below, supporting the developed principals and the use of a didactic MUGE:

### Start

For a teacher, the steps below form an example of an application of collaborative constructivism, in which a teacher forms and joins a community of inquiry that is situated within a specific discipline (subset) to develop situated meanings:

- Choose a discipline or semiotic domain;
- Define one or more affinity groups within the domain;
- Define intelligences and learning styles befitting the affinity group(s);
- Define characters and their traits, i.e. roles, based on those intelligences and learning styles;

### Cycle

Subsequently, the steps below form an example of an application of a didactic MUGE, in which a community of inquiry uses game technology to add an additional explicit experiential component to the learning experience:

- Define a progression that portrays the intelligences and learning styles;
- Build a setting as a stylized concept of a real-world activity;
- Add the defined progression rule structures and play it out;
- Redefine intelligences and learning styles as a critique to the setting;
- Redefine characters and their traits, i.e. roles, based on the redefined intelligences and learning styles;

### End

Finally, the cycle above can be repeated until learners have created a setting within a didactic MUGE that allows any player to choose between different progressions as stylized concepts of real-world activities. Combined, emergence, in which strategies need to be formulated, is encouraged.

The steps above represent a single example of an educational practice. They do not necessarily have to be followed to the letter. Moreover, they should not be followed serially if they are followed to the letter. If they were followed serially to the letter, the learning experience would be quite lengthy indeed. Instead, existing MUGEs can be used to help develop or critique intelligences and learning styles within one or more disciplines. Thus, the steps above primarily summarize a conceptualization of an educational practice based on collaborative constructivism that uses a didactic MUGE as an additional experiential learning component.

Using a MUGE in collaborative constructivist didactics is warranted if the original educational practice did not accommodate experiential learning. Within natural sciences, experiential learning is imaginably adopted widely and thoroughly already. Indeed, when emphasizing situated meanings within disciplines by recreating settings as stylized concepts, it seems that a didactic MUGE is best applicable when the learning experience is situated within social sciences or the humanities. Within such disciplines, it is conceivable that experiential learning is not always adopted. A didactic MUGE can enrich collaborative constructivist didactics by offering opportunities for experiential learning styles within disciplines in which such learning styles are often not necessarily accommodated.

My research is a result of the application of explicated principals in which experiential learning, collaborative constructivism and an interdisciplinary approach were exemplified in a research methodology. Situating myself in cognitive psychology, pedagogy, didactics and computer game studies, I have connected different disciplines to argue for alternate educational practices within Dutch higher education with the help of a didactic MUGE. Basing my argumentation on pedagogy, I have signalled different MUGE technologies that together represent a specific valuable pedagogical principle for higher education: collaborative constructivism.

It is clear that more research is required to refine the concepts of collaborative constructivist didactics with the use of a didactic MUGE. Specifically, the application of theories of multiple intelligences, learning styles and literacies in a didactic MUGE need to be researched more thoroughly to shed light on the specific intrinsic or extrinsic qualities of different MUGE technologies, as well as playing with them. By experimenting with the concepts developed in this thesis within case studies of learning experiences, good practices can be formulated and the use of computer game technology within higher education can be argued further.

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