THE ISOLATION EMOTION: AN EMOTIONAL POINT OF VIEW ON TEAMING AND GROUP TOOLS IN E-LEARNING ENVIRONMENTS

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ABSTRACT

The Socio-constructive approach applied by the largely used e-Learning platforms tries to give the learners the ability to build their own knowledge by searching, analyzing and discussing information in a collaborative environment. This approach has known a large success. In this paper, we will look to this approach from an emotional point of view. The idea is to understand the emotional dimension of the collaborative tools that allow the realization of Socio-constructive learning activities. To do so, we have chosen to use a 3D learning environment in a, attempt to understand the link to the isolation emotion which is generally expressed in text-based environments. The main idea is to prove the presence of an emotional dimension in every component of e-Learning platform. If proven, this affirmation could help us to define new design approaches that exploit this emotional dimension and don't need additional emotion-dedicated components.

KEYWORDS

Emotions; Isolation emotion; 3D Environments; E-Learning

1. INTRODUCTION

Emotions are strongly related to learning activity (Picard, 1995)(O'Regan, 2003). Today, studying and analyzing learning emotions are a key factor in providing a better learning experience (Lin, & al., 2010). This importance becomes more urgent in an e-Learning context (Lin, & al., 2010). With the absence of the human contact, the teacher is no longer able to detect the emotional state of the learner; an ability that can be seen as trivial in a classic classroom course (Lin, & al., 2010). Consequently, providing course adaptation and motivational support becomes more difficult (Picard, 1995)(Lin, & al., 2010).

One of the first and most used framework to represent learning emotions is the FEASP named after the five emotions: Fear, Envy, Anger, Sympathy and Pleasure (Astleitner, 2001). In larger emotional theories, these emotions are seen as basic emotions (Geslin, 2012)(Ekman, 1999). In this paper, we will try to put in focus another less studied emotion that is the emotion of isolation.

Isolation can be defined as "having a well-functioning social network but still feels emotionally separated from others" (Helgason & al., 2001); we can adapt this notion to a learning group by saying that intentional isolation during a learning session is the sensation of separation from the other members of the learning group. It can be seen as the contrary of belongingness where the learner sees himself as a part of the team (Baumeister & Leary, 1995). In a learning context, teaming is a powerful tool in organizations; including classrooms (Quinn, 2016). Its importance allowed the proposition of a whole new pedagogical approach known as "Socio-constructivism" (Raynal & Rieunier, 1997). This approach came to complete the constuctivism approach which sees the learner as an active agent during the learning process (Quinn, 2016)(Raynal & Rieunier, 1997). In the socio-constructivism approach, the learners are seen as a set of teams that build actively their knowledge by searching and analyzing information and performing experiments (Raynal & Rieunier, 1997).

In e-Learning context, a large part of these notions are lost with the absence of the human to human (direct) communication (Lin, & al., 2010). The teaming in text-based environment such as chat rooms and forum groups seems to be very limited compared to teaming and grouping in real-life classic classroom environments (Cruz-Lara, 2010). Consequently, the emotion of isolation appears more frequently in e-Learning context (Cruz-Lara, 2010).

To resolve this problem, we can proceed with the generic approach of emotion integration in e-Learning systems (Lin, & al., 2010). This approach defines three steps: emotional indicators' collection, emotion recognition and system reaction (Lin, & al., 2010)(Geslin, 2012). This approach can be applied in different situations and integrated in different e-Learning platforms; however, it represents a very high coast in implementation, integration and evaluation. It can, also, require the use of particular equipments (Boutefara & Mahdaoui, 2015).

In this paper, we explore another option to prevent the isolation emotion: the use of 3D environments. The idea finds its roots in two main points. First, the success of virtual agents and emojis as an enhancement of the on line communication in there absence of the face-to-face (human-to-human communication) (Cruz-Lara, 2010)(Kim, 2015). Second, the success of the Socio-constructivism approach in teaching (Raynal & Rieunier, 1997). In an emotional point of view, we think that the success does not reside in the value of interactions only but by the emotional state of the group members which can be seen as the opposite of the isolation emotional state (Baumeister & Leary, 1995).

In this paper, we present a local experiment which aims to provide emotional feedback, mainly about the isolation emotion, during a learning activity in a 3D environment. The paper is devised to three main sections. First, the related work section presents briefly a set of important notions for the realized work. Second, the experiment section presents the used tool, the experiment plan and the experiment result. Finally, the discussion section presents a critical analyze of the obtained results.

2. RELATED WORKS

In a learning context, such as e-Learning, the obtained results in the cognitive field represent a sufficient justification to study the possibilities and opportunities to take in count the learner emotional state on e-Learning platforms (Picard, 1995).

The largely used e-Learning platforms, such as Moodle (http://www.moodle.org/), try to give support for the socio-constructivism learning approach. They offer a set of tools such as forums, chat and blogging to allow communication between the teacher and his learners and the communication between learners during learning activities (Angeli & al., 2003)(Naidu, 2006). We think that these tools have an emotional dimension that can be exploited in taking in count the learner emotional state during learning activities.

A platform that takes in count the learner emotional state should be able to accomplish more that the detection; it should be able to influence the emotional state to obtain the more adequate emotional state for the current learning activity or to prevent emotional states with negative effect on learning activity such as frustration (Lin, & al., 2010)(Geslin, 2012). To achieve this goal, many works have been realized. Some of these works use virtual agents (Faiver & al., 2002). Virtual agents try to simulate the presence of a human being that accompanies the learner during the learning activity (Faiver & al., 2002). The main reason that justifies its utilization is the limited possibilities given by the textual tools as support of communication. Virtual agents are also used in 3D and VR environments (Cruz-Lara, 2010).

Taking these points and the precision that we are trying to adopt an emotional point of view, we define the following hypothesis: it is possible to realize an e-Learning environment that can have a well known and manipulated emotional effect on learners without the need for additional dedicated tools.

3. EXPERIMENTATION

The defined hypothesis is a generalization of perceived facts; we will not be able to validate it with one experiment. Therefore, the realized experiment had as main goal the obtaining of explicit feedback from learners about the isolation emotional state after using a 3D e-Learning environment.

3.1 Open Wonderland

Open Wonderland (http://www.openwonderland.org/) is an open-source toolkit for creating collaborative 3D virtual worlds. The learners are present by their avatars and can move from a location to another by walking and they can express body gestures. This environment offers a set of collaborative tools such as chat, the collaborative white board, live conferencing and screen sharing. These tools allow the design and deployment of different forms of learning resources and the performance of live demonstrations and experiments.

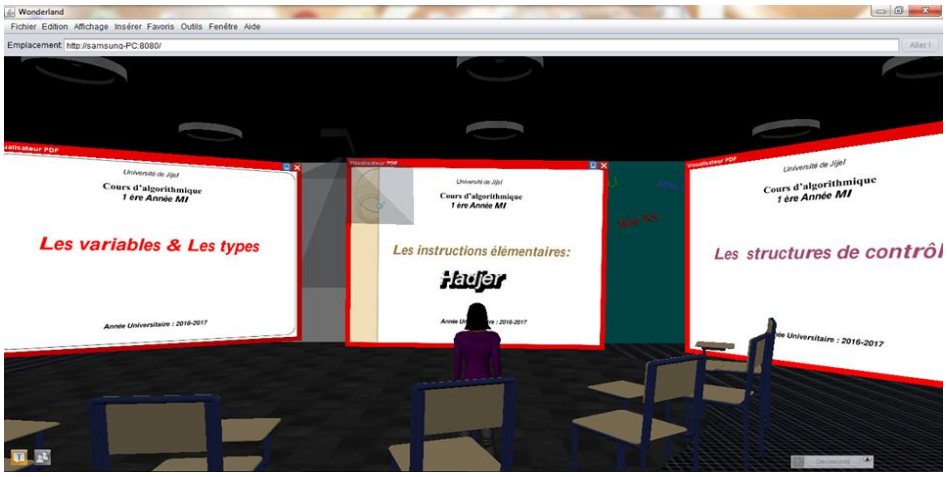

Figure 1. File display component, one among many collaborative tools in Open Wonderland

3.2 Experiment Plan

Given that the aimed emotion in this study is the isolation emotional state, we have to conceive an experimentation that tries to eliminate other learning emotions that can affect our experimentation. Thus, we have not included grading activities and prerequisite knowledge to avoid Fear, Anger and Envy.

The experiment has been performed by 20 students; each one has assisted to Algorithmic learning session of 30 to 40 minutes with the ability to use different collaborative tools. The feedback is gathered using a form that every participant will fill just after the end of the experiment and through a set of observation notes.

3.3 Results and Discussion

The experiment has been held recently; we are still analyzing and mining all the significant paths in the collected data. This is a first impression of the obtained result while:

- Attention and implication: the learners have all presented a very good level of implication, attention and activity during the learning session.
- Similarity to classic classrooms: 60% have said that the 3D environment is very similar, on communication aspect, to the classic classrooms compared to 40% for fairy similar.
- In comparison to text-based e-Learning environment, the simulated presence of the teacher has been seen as the most valuable aspect. Having the sensation of a direct human-to-human communication have been felt by 90% of the students.

The first feedbacks from the experimentation are very encouraging. The feeling of having a human-to-human communication means that the emotional state of isolation has been avoided in the 3D learning environment. The experiment does not imply all the factors related to isolation emotional state or all the possibilities of text-based and 3D based e-Learning environments. However, being able to exploit the nature and the emotional characteristics of the learning support, in this case the 3D environment, to induct or to avoid a particular emotional state without the need to implement or to integrate a full stack emotional systems (detecting and reacting system) is an encouraging validation (even partial) for the fixed hypothesis.

4. CONCLUSION

In this paper, we have tried to study the effect of a 3D learning and collaborative environment on the isolation emotional states to the learner. The main motivation for this work is to understand the emotional dimension in the Socio-constructivism tools. Understanding this dimension can help us to design and build on line courses that take in count the learner emotional state without the need to implement an emotion detection and reaction system. In this work, we have limited our field of action to one emotional state which is the isolation emotion. A 3D environment has been chosen to simulate a classic classroom.

The realized experiment on 20 students that tries to limit the influence of other learning emotion to allow a better observation of the isolation emotional state helped us to obtain a significant feedback from the students. The obtained results are very encouraging; the virtual presence was seen by most learners as very similar to the physical presence and their implication in the activity was very strong. The emotional state of isolation was not observed, therefore, we can say that the nature of the 3D environments gives the opportunity to design and build an on line learning experience with no isolation emotional state.

This reasoning can be generalized in farther studies to define explicitly the emotional state of every available tool on today e-Learning platform; the obtained data can be included in the course design to take in count the emotional dimension of the learner without the need for additional or dedicated components.

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