

VIRTUAL AGENT'S DESIGN AND ITS' VALENCE AND AROUSAL EFFECT ON EMOTIONS IN LEARNING: A RESEARCH PROPOSAL

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Keywords: Virtual agent; uncanny valley; emotion in learning

ABSTRACT – *Virtual agents are animated life-like characters used in virtual learning environments to facilitate learning tasks. The effectiveness of virtual agent in term of promoting positive emotion is very much related to character realism influences. The level of realism of virtual agent may cause distress to the users, especially when the character mimics like human; which was based on the uncanny valley phenomenon highlighted by Mori in 2012. Therefore this research is aimed to analyse the effect of different realism level of the virtual agent's design on students' emotions.*

1. INTRODUCTION

Generally, virtual agents are animated life-like characters used in virtual learning environments to facilitate learning tasks (Bian & Yang, 2016). Virtual agents play motivational role in educational setting to increase motivation among the learners in order to produce meaningful learning (Mohanty, 2016). When they engage in learning tasks, a good social interaction will be created and maintained between virtual agent and learners (Berry, Butler & Rosis, 2005). Since social relationship between the virtual agent and learner is important, thus bigger prominence should be granted in design phase of the virtual agent appearance (Shiban et al., 2015). The effectiveness of virtual agent in term of promoting positive emotion is very much related to character realism influences (Mohd Najib, 2015).

Based on previous researches in animation and games industries, it clearly indicates that the realism factors have impact on the success of the animation and games (Schwind, Wolf, Henze & Korn, 2015). Hence, question arises if the same effects will befall on the virtual agent, specifically for education purposes? Therefore, it is essential to conduct studies that address this phenomenon in instructional settings.

2. RESEARCH BACKGROUND

These days, animations are consolidated as a feature of computer based multimedia learning aid to facilitate human learning through technologies such as virtual agent (Tien & Kamisah, 2010). In designing aspects, the level of realism of the virtual agent is among the most vital attribute that should be addressed (Ahmad Zamzuri & Mohd Najib, 2016). It is to ensure that the virtual agent animation is capable of obtaining maximum impact in learning (Baylor, 2011).

According to Mori (2012), a character that is too realistic or almost resembles a human would eventually cause viewers to feel fearful and horrified when viewing these characters which is also known as the Uncanny Valley phenomenon (Tinwell, 2016; Mohd Najib, 2015). If a virtual agent does not exhibit socially acceptable behavior, then people may reject it. Moreover, the level of realism of three-dimensional animated characters is higher in resembling the actual human compared to a two-dimensional animated characters (Mohd Najib, 2015). Therefore, this study will only focuses on various realism design of 2D characters. Most studies on the impact of the level of realism were focused on the film industry and very less in education field. Consequently, it is important to conduct studies that analyse the impact of realism levels of the virtual agent in teaching and learning media as well.

Many previous studies only focused on agent's appearance but limited on realism level of the character (Shiban et al., 2015). Besides, past studies only focused on students' emotions caused by character's appearance in isolated and not on the entire learning process. Hence, this study aims to address the gap by studying on the impact of different realism level of virtual agent.

Firstly, the character's appearance in isolated on students' emotions in the dimension of valence and arousal. Secondly, students' emotions on overall learning and thirdly, its relation. For that, four different realism level of virtual agent in Multimedia Learning Environment (MLE) had been developed as experimental items and tested to analyse its impact, specifically on emotion caused by the character's realism level and emotions in learning. Accordingly, the four 2D female virtual agent prototypes are realistic agent, semi-realistic agent, stylized agent and cartoon-like agent.

3. PROBLEM STATEMENT

Adequate realism level of virtual agent might have an impact in simulating positive emotions among the learners. Although, different realism level of virtual agent would create different emotions among learners, it is still unclear on how to design the appearance of a virtual agent to improve students' positive emotions. The relationship between learning and emotion is not something new but still very few numbers of researchers who have studied about it.

4. THEORETICAL FRAMEWORK

The Mayer's Cognitive Theory of Multimedia Learning (Mayer, 2009), Mori's Uncanny Valley phenomenon (Mori, 2012) and Russell's Circumplex Model of Affect (Russell, 1980) used as the basis to construct conceptual framework in this study.

A conceptual framework of this study has been constructed, as depicted in Figure 1.

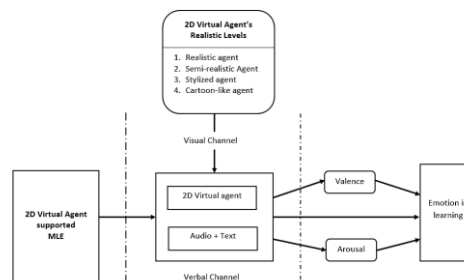


Figure 1 Proposed Conceptual Framework

5. RESEARCH OBJECTIVES

The self-assessment manikin (SAM) nonverbal pictographic questionnaire will be used to measure students' individual emotions in the dimensions of valence and arousal on the different realism level of the animated virtual agent design. Whereas, the achievement emotions questionnaire (AEQ) will be used to measure students' emotions in as a whole.

Accordingly, the specific objectives of the study are as follows:

- To analyse the effect of different realism level of the virtual agent design on students' emotions in the dimension of valence.
- To analyse the effect of different realism level of the virtual agent design on students' emotions in the dimension of arousal.
- To analyse the effect of different realism level of the virtual agent on students' emotions in learning.
- To analyse the relation between students' emotions in the dimension of valence caused by different realism level of virtual agent design and emotions in learning.
- To analyse the relation between students' emotions in the dimension of arousal caused by

different realism level of virtual agent design and emotions in learning.

6. CONCLUSION

Animated virtual agent acts as computer generated animated character that can serve as a social model to hold meaningful interaction with learners. A mismatch in virtual agents' visual elements could attribute to negative impact on students. It is because, level of realism on agent may cause distress to the users, especially when the character mimics like human based on uncanny valley phenomenon. Therefore, this study focuses on the realism impacts of virtual agent on students' emotions in learning.

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