



**Measuring and defining the experience of immersion in games**

This paper talks about whether immersion can be defined quantitatively by using three experiments. The first experiment investigated participants' abilities to switch from an immersive to a non-immersive task. The second experiment investigated whether there were changes in participants' eye movements during an immersive task. The third experiment investigated the effect of an externally imposed pace of interaction on immersion and affective measures (state anxiety, positive affect, negative affect).

In the conceptual background of immersion, the paper talks about the three levels of immersion: engagement, engrossment and total immersion. These levels are defined as how comfortable the gamer is in the gaming environment. In total immersion, gamers are cut from reality to an extent that only the game mattered. There are three main ideas that are widely used to describe engaging experiences: flow, cognitive absorption, and presence. Flow is described as the process of optimal experience, where the individuals are absorbed in their activities. Cognitive Absorption (CA) has been described as a state of deep involvement with the software. Presence is described as a psychological sense of being in a virtual environment.

In the first experiment, the participants were given a tangram task to complete the pretest and post-test. The results showed that the time to complete the task the second time was less than the first time. The hypothesis predicted that the more immersed a person is, they would improve less in the tangram task. I think this is a great way to check if a person is immersed or not. In our research, we can ask the artist to take a break while performing and the participants can be tested on non-immersive tasks. This would give us a clear understanding of how involved the participants were in the live art performance.

In the second experiment, the results were presented as eye gaze data trends, subjective immersion ratings, and qualitative analysis. The level of immersion in the immersive condition was higher than the level of immersion in the non-immersive condition. Fixation data revealed that participants' eye movements significantly increased over time in the non-immersive condition. In contrast, participants' eye movements in the immersive condition significantly decreased over time.

A new questionnaire was divided into six sections in total. The first three sections were concerned with varying degrees of attention to the task: basic attention (e.g. To what extent did you feel you were focused on the game?), temporal dissociation (e.g. To what extent did you lose track of time?), and transportation (e.g. To what extent was your sense of being in the game environment stronger than your sense of being in the real world?). The questionnaire consisted of 31 items overall: basic attention (4 questions), temporal dissociation (6 questions), transportation (6 questions), challenge (6 questions), emotional involvement (5 questions) and

enjoyment (4 questions). Participants are asked to rate from a scale of 1 to 5 how they felt at the end of the game (where 1=not at all and 5=very much so). Immersion scores are computed by summing participants' answers to all 31 questions.

Researchers validated this questionnaire by doing a study on 260 participants who were above the age of 18 and had played a computer game in the last week. The results showed that the questionnaire was a mixture of personal and game factors. This is a great questionnaire sample that can be used in our project. Some variations can be made to relate to the live art performance rather than the gaming experience. Since the questionnaire is tried and tested, it will be easier for us to follow its format and test it on our first sample of performance viewers.

In the third experiment, participants were randomly assigned to one of four conditions: self-paced, slow-paced, fast-paced and increasing pace. The increasing pace had the highest mean immersion score followed by the fast condition, the slow condition and then the self-paced condition. Positive and negative effects were also calculated. The self-paced condition had the highest positive affect score. The increasing pace condition had the highest negative effect. Participants in the increasing pace condition experienced the highest level of state anxiety and negative affect. Therefore one can suggest that emotional involvement appears to be a key factor in immersion.

**Works Cited**

Jennett C, Cox AL, Cairns P, et al. Measuring and defining the experience of immersion in games. *Int J Hum Comput Stud*. 2008;66(9):641–661.