

Workshop—ILLUA- Promoting Self-Regulated Learning through Metacognitive Applications in a 3D Virtual Environment

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Abstract—Overall, it is argued that future research has to conduct more in-depth process analysis that incorporates multi-method assessments and it also has to investigate how individual learner skills can be fostered. This workshop is a current research in prompting needs more insights on how students actually deal with meta-cognitive prompts.

Index Terms—*self-regulated learning, metacognition, learning strategies, instruction, prompting, virtual 3D-Environment, openSim*

I. INTRODUCTION

Teachers, lecturers, and instructors are currently facing a major challenge concerning the corona crisis. On the one hand, teachers feel overwhelmed with the situation of carrying out an online distance education setting because of insufficient relevant media skills. On the other hand, the challenge of switching between on- and offline teaching, results in inadequate learning arrangements. Comparative studies show that game-based learning environments prove to be more conducive to learning than regular learning arrangements as long as certain didactic design criteria are taken into account [1].

II. WORKSHOP TARGETS

Our aim is to answer the following question: How should an interaction design within a 3D learning environment be structured in order to promote metacognitive learning strategies effectively?

The lab team will provide a combination of presentations, exercises, share resources and results, and recommend specific aspects for 3D learning environments. Furthermore, the participants will be provided with concepts, cases, and networks to further the application of their own work.

If the learners find it difficult to orient themselves in a 3D learning environment and are distracted by irrelevant content, they can quickly become cognitively overwhelmed while completing learning tasks [2]. We assume that three-dimensional learning environments with a high cognitive structure and a prompt-based interaction design, can particularly be conducive for learning processes because they effectively support the use of meta-cognitive learning strategies and can, therefore, be accompanied by self-regulation of the cognitive learning process [3].

If a learning process is monitored via a learning protocol as a meta-cognitive learning aid it facilitates the application of cognitive learning activities [4]–[6].

The participants of this workshop are going to learn about the goal-oriented use of possible metacognitive aids to optimize various training scenarios.

III. TARGET AUDIENCE

This workshop is designed for participants with and without experience in virtual environments. The only requirement is an interest in:

A. 3D-Virtual Environments

- learning in general about 3D tutorial-based environments,

B. Didactic design

- learning how to design a 3D tutorial-based environment,

C. Interventions

- being part of a live experience with interventions through learning protocols and metacognitive prompts.

IV. WORKSHOP STRUCTURE

What this workshop will present you is how an interaction design should be arranged within a 3D learning environment to promote the use of metacognitive learning strategies effectively. The focus of the intervention is on self-regulated learning with the help of a learning protocol and metacognitive prompts to optimize the learning process.

Additionally, it points out how the concept of online support should be organized for the participants to promote immersion within a 3D learning environment. The Workshop is divided into three main parts in which the participants guides a subject's Avatar through the 3D learning environment by giving him instructions on how to solve upcoming tasks.

In the first part, participants will learn about the basics of metacognitive learning strategies through an explanatory video. The acquired knowledge will be tested with a Kahoot! -quiz. The second part presents possible mistakes occurring when creating a 3D-objekt, while sensitizing the participants for metacognitive strategies. Finally, the third part provides the possibility to experience the use of metacognitive learning strategies. In this scenario, the participants get the opportunity to apply those strategies by using a learning protocol and processing live prompts.

TABLE I. WORKSHOP AGENDA

<i>Agenda</i>	<i>Time & Duration (min)</i>	<i>Format</i>
Welcome and Introduction	10	Zoom
Part 1: Basics of Metacognitive Learning Strategies	20	Kahoot! -quiz
Part 2: Finding and Fixing Faults in Predesigned 3D-Objects	20	Zoom
Part 3: Practice Metacognitive Learning Strategies	20	CryptPad
Survey and Closing	20	Survey

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