AALBORG UNIVERSITY
COPENHAGEN

INVITATION to PhD Defense by Evangelia Triantafyllou

Department of Architecture, Design & Media Technology, Aalborg University Copenhagen

Thursday, December 10 2015, 13.00-16.00

A.C. Meyers Vænge 15, 2450 Kbh. SV, Room B1/1.008 (Auditorium)

Title:

"ICT-based teaching methods for improving mathematics learning for Media Technology students: Investigations and findings"

Introduction:

Over the past years, a number of engineering programs have arisen that transcend the division between technical, scientific and art-related disciplines. Media Technology at Aalborg University, Denmark is such an engineering program. In these fields, mathematics is increasingly used as the actual building block in various new digital products and creative expressions. This new development has also implications on how mathematics should be taught in these studies. This PhD project investigated and assessed interventions to increase student motivation and engagement in mathematics among Media Technology students. These interventions focused on two directions: a) teaching methods and b) ICT-based learning environments. As far as teaching methods are concerned, this project has applied the flipped instruction model (or the flipped classroom). Regarding ICT-based learning environments, visualizations of mathematical topics have been developed and a game engine (Unity) has been introduced as a domain for mathematical learning. Since many studies have indicated that the attitude towards mathematics influence the achievement of learning goals, Media Technology students' attitudes towards mathematics were also investigated. Several mixed method studies have been conducted in order to explore student attitudes and to assess the impact of these interventions. It was found that these students often lack mathematics confidence and they consider mathematics a difficult subject that they don't like but value. The adoption of the flipped classroom instructional model revealed that students perceive learning with online resources on their own pace as contributing to their understanding and they reported that they could adjust the learning process to their own needs. This project has also proposed the use of a model of reflection for designing activities that promote experience-based learning in flipped classrooms. As far as ICT-based learning environments are concerned, this project has explored two different implementations and provided insights on how students apply knowledge from a mathematical model to implement a physical model. This study shed light on students' misconceptions and difficulties but also on their opportunities to challenge their understanding. The results of this project can be furthermore used to assess and improve practice in Media Technology and other trans-disciplinary engineering programs.

Assessment Committee:

Professor Stefania Serafin (Chairwoman)
Department of Architecture, Design & Media Technology, Aalborg University Copenhagen

Associate professor Nikolas Vidakis
Technological Education Institution of Crete, Heraklion, Greece

Associate Professor Stefan Hrastinski
KTH Royal Institute of Technology, Stockholm, Sweden

Supervisor: **Associate Professor Olga Timcenko**
Department of Architecture, Design & Media Technology, Aalborg University Copenhagen

The supervisor is a committee member in a non-voting capacity

A small reception will be arranged afterwards in the guest canteen area.

The PhD Dissertation can be obtained from Evangelia Triantafyllou by sending an email to evt@create.aau.dk