An Undergraduate Primary Education Students' Teaching Practicum Design on Developing Technological, Pedagogical and Mathematical Knowledge (TPACK) via teaching Scenarios

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Now days research in educational technology suggests that there is a need for "Technological Pedagogical and Content Knowledge" (TPACK), so as technology to be incorporated in pedagogy (Niess, 2005; Angeli & Valanides, 2009). This interconnectedness among content, pedagogy and technology has important effects on learning as well as on professional development. Mishra and Koehler suggest that "...*a curricular system that would honour the complex, multi-dimensional relationships by treating all three components in an epistemologically and conceptually integrated manner*", and they propose an approach which is called "*Learning Technology by Design*" (Mishra & Koehler, 2006, p. 1020). Also, according to Paul Cobb et al. (2003), design experiments constitute an effective methodology for studying teacher development in the setting of an education department.

Moreover, the last decade educational scenarios, (educational activity plans) which take into account technological tools, support design experiments so that a) to gather more accurate data and b) to give students the possibility to come to knowledge (Kynigos, 2006). According to the above briefly mentioned theoretical background, our research focuses on 4rth year students', becoming primary teachers, development of TPACK concerning educational scenarios (ES) in teaching geometry. We have adapted a multiple research method approach (qualitative and quantitative) for the 25 participants in the Department of Primary Education of the Aegean University, who were attending the compulsory course "Applied Methodology for Mathematics - Practicum B" during 2008-2009 spring semester.

The researchers provided students with opportunities "*to develop and practice teaching lessons that take advantage of the ability of technology to enrich and enhance the learning of mathematics*" (Association of Mathematics Teacher Educators [AMTE], 2006, p. 2; Jones, 2000; Pickreign, 2007).

Data were collected and are currently analyzing, quantitatively (questionnaires) and qualitatively (audio and video recordings, observations, interviews, narrative observations) in a technologically elaborate working environment. The technological environment consisted of a) the educational software (microworlds: "Geo-board", "3D solid manipulation (Solid-board)", "Calculator" and "Table Tracking") from Educational Software of Pedagogical Institute for Mathematics (ESPIM), b) Moodle as the Course Management Information System (CMIS), c) the educator's website, d) a forum, e) the research team's blog and f) the use of sms.

Whether or not a learning environment, rich in technological tools and student support in authentic educational scenarios design, give opportunities to students to draw the necessary connections between technology, mathematics and pedagogy, so as to improve their TPACK teaching skills, is a challenge for us to answer in this research project.