Collaborative meaning generation processes while interacting with a 3d turtle geometry microworld

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This poster reports on a study conducted to explore the way students collaboratively generate mathematical meanings, as they engage in open-ended, non-standard mathematical problems, that call for planning in advance the course of action to be taken so as to address them. The study took place for 26 school hours in a Lower Secondary Education school, in Athens, with ten 15-year-old students divided in two Groups. The members of each Group -working in subgroups of two-communicated through a web-based Platform called Metafora.

The Metafora Platform hosts three types of tools: Microworlds and Authoring Tools for Microworlds, a Discussion Tool called LASAD and a Planning Tool for describing the course of action to be taken in the process of exploring mathematical concepts when working with the microworlds. The 3d math Authoring Tool is a Turtle Geometry environment that allows the creation and dynamic manipulation of geometrical figures created in 3d space using Logo commands. It is designed to provide students opportunities to express mathematical ideas by integrating the use of symbolic notation (Logo programs) with the dynamic manipulation of 3d geometrical constructions, using specially designed Variation Tools (Kynigos & Psycharis, 2003). For this Study we designed with 3d Math, a half-baked microworld (Kynigos, 2007) called the "Twisted Rectangle". Half-baked microworlds, being incomplete by design, challenge students to deconstruct and reconstruct them, possibly forming new artefacts completely different than the initial ones. In this poster, we will attempt to highlight students' meaning generation processes as they work with the TwR half-baked microworld. We put emphasis, however, on the collaborative shaping of those meanings as students discuss ideas, share parts of their microworlds, negotiate and argue on how to combine those parts while creating new 3d figures.

Acknowledgements

References

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