

Interactive teaching tools and mathematical student competency: Pedagogical experiment in higher mathematics courses teaching

Daria Termenzhy

Vasyl Stus Donetsk National University

`gubar.darya@gmail.com`

The talk is devoted to implementation of various interactive teaching tools into the up-to-date higher mathematical education. This research reports a six years long experiment which took place in Vasyl Stus Donetsk National University in Ukraine. The experiment was led by own research group of three academics (including author) of the Faculty of Mathematics and IT (now Faculty of Information and Applied Technologies). We worked with 14 students of the Faculty who specialized in Mathematics from 2013/2014 till 2018/2019 academic years. The selection of students was based on their interest and ownership of appropriate gadgets for studying (laptop, smartphone, PC, webcam, etc.). The learning was done by carrying out student activities with applying interactive tools into several mathematical courses (Analytical Geometry (2013/2014), Logic (2014/2015), Differential Geometry (2014/2015), Methodology of Teaching Mathematics (2015/2016), History of Mathematics (2016/2017), IT in Teaching Mathematics (2017/2018), Preparation of Master's Work (2018/2019). The students used educational interactive portal and distance courses at LMS Moodle developed by author. It included syllabus; tutorial video lectures; diagnostic tests; links to external webpages with mathematical resources that explore the different contents of the course; additional tasks (so-called "extraproblems"); e-lectures with links for downloading; online quizzes and surveys; online consultation module; interactive mathematical games; library of students' scientific projects; discussion forum panel. We have a long-standing experience of the applying technologies for enhancing the quality of higher mathematics learning. I started a pilot experiment with applying of educational interactive portal in freshmen course of Analytical Geometry for Mathematics students at the University in Fall 2012. This study was preceded our experiment, some results were presented in author's PhD thesis and proved the efficiency of applying interactive teaching tools in mathematical course. The test procedure of the experiment consisted of 5 parts: pre-test (Math and IT literacy), intellectual test (intellectual lability, ambition test), post-test (Math and IT literacy), several questionnaires and interviews. We also carried out some electronic surveys designed with applying Google Forms. More detail of this experiment and its results will be covered in the talk.