

THE DEVELOPMENT OF OPEN PROBLEMS AS LEARNING MATERIALS IN ANALYTIC GEOMETRY COURSE THROUGH DIFFERENTIATED INSTRUCTION

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ABSTRACT

Students have different skills and strategies in grasping information in the learning process. One of the prominent and effective characteristics of learning is when the learning process can respond to students' needs. Differentiated instruction is a learning strategy which accommodate distinction of readiness level, interest, and students' learning profile. Open problems are problems presented regarding situation to open any responses and approaches in solving tasks. This present study aimed at developing open problems as learning materials in analytic geometry course by implementing differentiated instruction strategies.

This study used design research. According to Plomp, design research consists of three phases, namely (1) preparation and design, (2) implementation, and (3) retrospective analysis and redesign. In the first phase, researchers formulated preliminary design principle, designed the first conjecture map, or drafting (sketches) from hypothetical learning trajectory (HLT), discussed topics or materials which would be developed, and chose anything – tasks, activities, learning environment and any knowledge which would be generalized. In the second phase researchers did interventions, test, and teaching experiments. In teaching experiments, researchers used activities and a set of instruction or suitable action, observation, and study.

In the last phase, researchers compared HLT with students' data while learning through activities or different tasks, tested conjectures to seek information and counter examples, and interpreted by peer examination. Data collection conducted through observation (classroom observation and small group observation), interview, related documents, tests, and students' works. Study result showed that differentiated instruction is a complex learning strategy which require teachers to continue doing reflection and feedback from any students' activities. One of the activities which has potency to differentiate in higher education or university is open problem.

Kata Kunci: open problems, analytic geometry, learning material, differentiated instruction