PRE-SERVICE STUDENT TEACHERS' (PSST) PRE-NOTIONS IN GEOMETRY

Judah P. Makonye
School of Education, University of Witwatersrand

The research presented in the form of a poster aimed to explore first year B.Ed. students' amateur concepts (Vygotsky, 1978) on geometrical tasks related to dimension and classification of quadrilaterals. Besides showing the specific errors and their prevalence in the sample, it also aimed to explore why students held those conceptions. The poster has 3 tables that show the tasks given to students and the answer choices for various questions. One of the questions was: What would you say to the statement: A parallelogram is a rectangle? They were to choose from; Always, Never or Sometimes. Students' responses are shown in percentages in the tables.

This research argues that errors and misconceptions play a major role in students' progress in learning mathematics and geometry (Shulman, 1986; Kembitzky, 2009). If the errors and misconceptions are not unpacked lecturers will continue to miss opportunities to help students learn from their errors.

Data for this study was collected from a group of fifty, 2013 first year Bachelor of Education, pre-service student teachers' (PSST) at a university in Gauteng from ten written geometry tasks (Table 1). They were also given tasks that required them to determine the dimensions of given geometrical figures (Table 2 and 3). The students' scripts were collected for analysis.

Students were also individually interviewed regarding the incorrect and correct answers they gave on the tasks. Analysis of students' results revealed staggering amateur concepts on the tasks. Some of amateur concepts gleaned from the tables are:

- A square is not rectangle, 86% of the students.
- A staggering 80% of the students asserted that a rectangle is never a trapezium,
- 40% regarded that a rhombus is always a square.
- On the issue of a hollow square as one dimensional, participants argued that since it is a plane figure then it is two dimensional. '… my primary school teacher taught me that the square is two dimensional, I am not about to give up this truth…'
- The interviews with the participants show that their conceptions on geometrical objects are static and show ambiguities.
- One student argued that "a square is a square and a rectangle is a rectangle. ..how can a square be a rectangle, that is a funny question!".
- Yet other students held that a rhombus is a square. One student said 'all sides in a rhombus are equal; its actually a *pushed* square' .

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