

ABSTRACT

Title: To own π
A study of student teachers practical work in geometry.
Language: Swedish with summary in English.
Keywords: Practical work in geometry, pedagogical content knowledge, student teacher, mathematics education, teaching mathematics, learning mathematics, variation theory.
ISBN: 91-7346-527-5

The aim of this thesis is to study what practical work, and follow-up tasks in the form of problems to be solved in groups, could imply for the learning of and attitudes towards a certain teaching content for student teachers.

The aim is also to study student teachers who carry out practical work with pupils and to search for critical features of the ways in which they lead this practical work.

The study takes as its starting-point a number of central concepts in elementary geometry.

The empirical study consists of two substudies. In the first substudy, the student teachers' own learning was studied when they were working with practical geometry. In the second substudy, a study was made of how student teachers lead practical work in geometry with pupils in 9-year compulsory school.

Participants in substudy 1 included all 51 students who were taking their last mathematics course in the teacher training 1-7 program at a small university in Southern Sweden. The students in substudy 2, 22 in all, were attending a mathematics course, for future 4-9 teachers Ma-No, at the same university.

The great majority of the students say that they have changed their way of thinking about geometry and the teaching of geometry. They are now able to solve problems in more than one way, practically, concretely and by using formulae. This also provides them with new ways of explaining relations. They say that they think more logically and that the content now has a structure. Many of them feel that they had not previously understood what they thought they knew.

The students can be divided into different groups. The students in the group showing improved quality in their explanations, had experienced frustration and confusion. The students in the group with no improvement in quality at all had not experienced either confusion or frustration.

The results show that the way of leading the practical work can be described in three dimensions. The first dimension concerns what is focused on, the second dimension concerns who has the initiative, the pupil or the teacher and the third dimension concerns the communication between the teacher and the pupils. It can be noted that the students who allowed the pupils to take initiatives also took the pupils' thoughts about the content into account. The observations indicate that there was a lack of an adequate language when student teachers talked about geometrical objects and concepts.

When the student intends to communicate with the pupil about the aim of the practical work, he needs to relate what he says to the pupil's previous knowledge. This requires identifying this previous knowledge. We could see that the students found it difficult to determine whether the pupils had the desired previous knowledge or not.