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The influence of practical work on chemistry teaching and learning: an approach using microchemistry kits in Mozambican junior secondary schools

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ABSTRACT

The problem which motivated this research was the lack of chemistry practical work in many Mozambican junior secondary schools. This problem is so critical that quite often learners finish the three years of junior secondary school without performing even one experiment.

In an attempt to contribute to the solution to the problem, the microchemistry kits are introduced. For this purpose a study of the influence of kits on the teaching and learning of chemistry in a Mozambican context was conducted.

The study involved four out of five public secondary schools in the city of Beira, the second largest city in Mozambique. Two schools were chosen to be the experimental group, in which chemistry was taught using the RADMASTE microchemistry kits. Two other schools, in which chemistry lessons were taught normally, were chosen to be the comparison group. In each school one Grade 9 class was used for the study.

Before starting the study, 18 secondary chemistry teachers of the four schools answered a questionnaire and 163 Grade 9 learners answered another questionnaire. These were used to determine teachers' and learners' opinions about the importance and aims of practical work. Before the intervention a pre-test was administered to 181 Grade 9 learners within the four classes.

After eight weeks of intervention, the same post-test was administered to 171 learners from the same classes. A questionnaire was also administered to the two teachers of the experimental group and another questionnaire was administered to 86 learners from the experimental group. Both questionnaires were used to find out teachers' and learners' opinions about the microchemistry kits.

Practical work is viewed as an important method for teaching and learning chemistry, mainly to link theory and practice or use practical work to support theory.

There was a statistically significant difference between the pre-test and the post-test scores in all four schools. But, learners from the experimental group performed better than learners from the comparison group in the questions which required conceptual understanding and in laboratory-based knowledge questions.
The practical work also contributed to increase learners' interest towards chemistry.

It is recommended that the microchemistry kits be implemented in chemistry teaching in Mozambique, both in schools with laboratories and schools without laboratories, and that further studies should be carried out to identify effective ways of doing this.