

LEARNING SCHOOL MATHEMATICS IN THE ABSENCE OF A TEACHER IN CLASS: REALLY?

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In South Africa, as in many developing countries, poorly trained teachers, absenteeism and lack of financial resources pose serious problems for school education, particularly in mathematics. In this time and age, it seems logical to ask whether relatively accessible and affordable technologies, such as TV and video, can contribute towards addressing problems like these. Huge (1990) reports on the use of video recordings of mathematics lessons to successfully compensate for the absence of teachers. In addition, there is evidence that the use of a “video class system” (VCS) does not impair the learning and teaching of school mathematics (Lowry & Thorkildsen, 1991). In the current project the influence of a VCS on learning variables and achievement in mathematics was investigated in a pretest-posttest experimental setting; qualitative analyses of observations were noted too.

Three groups of classes participated in this project over a period of six months. The mathematics lessons of experimental group 1 (E1) were videotaped, which were then played back to experimental group 2 (E2) in the absence of a teacher. A third group of classes acted as a control group (C), taught by the same teacher in the “conventional” way. Although the experiment was conducted in two suburban state schools, this presentation focuses mainly on the observations and results obtained in a multicultural high school for girls, involving grade 9 learners ($n=100$). The instrumentation used comprised a version of the LASSI-HS (Weinstein & Palmer, 1990), adapted for mathematics, which was used to measure variables influencing classroom learning (e.g. attention, motivation, etc.), as well as a series of self-constructed mathematics tests, which were used to measure achievement.

Overall, the results seem to support the claim that the use of a VCS does not impair learning performance in classes E1 and E2, as no significant differences occurred between the achievement of the learners in the respective groups. Surprisingly significant differences ($p<0.05$) occurred concerning the learning variables: Compared to E1, E2-learners’ attention, use of main ideas and use of test strategies improved with medium effect ($d\geq 0.5$), however, their anxiety also raised markedly ($d=0.6$). Compared to E1 and C, E2-learners’ learning motivation differed with medium effect to almost practical significance ($d=0.7$; $d=0.5$), while their concentration ($d=0.5$) improved with medium effect. Finally, these results can, and will be connected to mostly “positive” qualitative changes observed in learning behaviour, especially in E2, as well as with marked mostly “positive” adaptations of teacher behaviour.