Science Teachers' Information and Communication Technology (ICT) Self-Efficacy and Classroom Technology Integration: The Case of Manicaland Province, Zimbabwe

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Abstract

Computers and the internet are becoming common in learner's everyday life. The learners therefore acquire competencies associated with these digital resources outside the classroom. The way the learners are educated must keep pace with the realities they experience in their lives outside the school environment. The initiatives by Zimbabwe to integrate ICTs in the teaching and learning process is in line with the current learners' digital image. The effort and determination in using information and communication technology (ICT) in teaching and learning is influenced by one's level of computer self-efficacy. The aim of the study was to determine the ICT self-efficacy and practices of Science teachers in Manicaland province of Zimbabwe and to propose a teacher professional development model to enhance Science teachers' self-efficacy to ensure ICT integration in the teaching and learning of science. The self-efficacy theory was developed by Albert Bandura's as a sub-set of a larger theory, the social cognitive theory. This study therefore drew from the social cognitive theory. This study used the mixed research methods and adopted the exploratory sequential design using a descriptive survey. Data was collected in two phases. The initial phase (qualitative) was done to identify challenges and impediments to ICT integration in the teaching and learning of science as perceived by the population members using questionnaires and interviews to collect data. The second phase of the research was carried out to determine the level of teacher ICT self-efficacy and the frequency of use of digital devices in lesson delivery. Generally, the teachers agree that they are not confident in using ICT in teaching

and learning, that is they are not computer self-efficacious (computer self-efficacy mean score=39, standard deviation =26.624). The Science teachers in the study sample never or rarely used ICT in the teaching and learning process (mean score=1.97, standard deviation = 0.825). There is a positive but moderate correlation between the Science teachers' ICT self-efficacy and their frequency of using digital teaching methodologies (correlation coefficient of 0.521). The linear relationship between the variables was statistically significant ($p<0.01$). The findings indicate that teachers' ICT professional development needs are not sufficiently addressed in a well-coordinated manner to ensure effective integration of ICT in teaching and learning. This study recommended that an effective monitoring and evaluation mechanism for the ICT integration in education should be put in place and teachers and senior management staff at schools should be professionally developed to ensure ICT integration in teaching and learning. Teachers should integrate technology in classroom practice using available devices. Well-coordinated technology centres should be established. An ICT policy dedicated to education besides the generalised one should be formulated.

Key words: Digital gadgets, Information and Communication Technologies, ICT self-efficacy, Digital teaching methodologies, Professional development, Technology integration.