Chapter 2

Use of Information Communication Technology in Science, Technology, Engineering, and Mathematics:
Insights During the COVID-19 Pandemic in Zimbabwe

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ABSTRACT

The purpose of the chapter was to evaluate use of ICT in STEM teaching and learning in teacher education during the COVID-19 pandemic in Zimbabwe. A quasi-experimental research design with five teachers' colleges and five universities was used. A posttest and a pretest were given to 220 learners before and after the intervention of ICT tools such as Google classroom and smartphones. Findings show that lecturers prefer the use of simple social media gadgets to deliver lectures in colleges and universities. There is a strong relationship between use of ICT and performance by learners tested at 5% significance level (P<0.005). The chapter concludes that lack of knowledge, skills, application of integrated functions contained in the ICT gadget has resulted in its poor teaching and learning in colleges and universities. Teacher education lecturers are trained on the use of ICT tools and how it can be used for teaching and learning in colleges and universities.

INTRODUCTION

The application of information and communication technologies (ICTs) have transformed the schooling system and created new opportunities important for the development of education worldwide. Mandina (2015) argues that "the role of ICT in the classroom in this information age is very essential in providing opportunities for students to learn" (p. 90). For example, in the context of science, technology, engineering, and mathematics (STEM) teaching, the use of ICT is reported to offer opportunities to motivate both learning and collaborative skills (Benta, Bologa, Dzitac & Dzitac, 2015). Chai (2019) describes STEM education as a curriculum system which involves the integration of science, technology, engineering and mathematics enhanced through teaching and learning activities in institutions. This chapter evaluates use of ICT in STEM teaching and learning in teacher education during the Covid-19 pandemic in Zimbabwe. The teacher education involved were teachers' colleges and universities, mandated to train science teachers in Zimbabwe.

BACKGROUND TO THE STUDY

The emergence of Covid-19 disease presented a lot of challenges with regards to the teaching and learning of science in teacher education. The disease was named Covid-19 and declared a pandemic by the World Health Organisation (WHO, 2020). The dangers associated with this pandemic is that person-to-person transmission occurs primarily via direct contact or through droplets spread by coughing or sneezing from an infected individual (Liu et al, 2020). This means that the virus is transmitted from human-to-human through contact between infected and uninfected individuals. Preeti (2020) noted that this pandemic COVID-19 has resulted in disruptions in the economic, social and political aspects of life. As a result, countries took various measures to control the spread of the disease. In Zimbabwe, government declared recursive national lockdown, travelling restrictions, social distancing (Mbunge et al, 2020). Following such declarations, Dzobo, Chitungo, and Dzinamarira (2020) observed that all school, colleges and universities were closed. Therefore, it meant that learning institutions including universities and colleges had to find alternative ways of teaching and learning during these restrictions.

Teachers' colleges and universities in Zimbabwe fall under the Ministry of higher, tertiary, science and technology education, now Ministry of higher and tertiary education, innovation, science, and technology development. This Ministry churns out teachers who would work mostly in the Ministry of Primary and secondary education (MoPSE, 2014). Currently what clearly separates Teachers' colleges from Universities is that the former follows a three or two-year course program to train

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