

Integrating TESSA Science OERs in the Secondary School Curriculum in Kenya for Effective Pedagogy

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Abstract

Teacher Education in Sub-Saharan Africa (TESSA) is a research and development initiative creating Open Educational Resources (OERs) for teachers and teacher educators in Sub-Saharan African countries. The project focuses on interactive pedagogical skills for Teacher Education programmes. It seeks to promote effective pedagogy through interactive curriculum materials intended to enhance learners' participation in the learning process. TESSA Secondary Science was initiated in 2010 following the success of TESSA Primary Project to support pre-service, in-service and practicing secondary science teachers. TESSA Secondary Science is the focus of this paper. The activity-based TESSA OERs focus on five themes; probing students' understanding, making science practical, making science relevant and real, problem solving and creativity, and dealing with challenging concepts. In Egerton University, Kenya the TESSA materials are used by Science Teacher educators to enhance pedagogical skills of pre-service teacher trainees during subject methods training, micro-teaching lessons and practicum. The use of the materials is expected to be further extended by teachers when they join the teaching profession. A monitoring and evaluation survey revealed that student teachers were using the TESSA OERs during practicum and this helped to actively involve learners. However, student teachers encountered challenges. These include lack of electricity and internet connectivity, and poor ICT infrastructure in some schools. The use of TESSA OERs may be useful in teacher preparation in the 21st century. There is need to deal with the challenges encountered to enable use of the TESSA Materials to enhance active learning.

Keywords; Integrating, TESSA Science OERs, Curriculum, Effective Pedagogy

Introduction

It is argued that the provision of good quality education depends on effective teacher education, which is a direct outcome of the teacher education programmes. Indeed, evidence suggests that teacher quality is an important factor in learners' success (Kini&Podolsky, 2016; Arends, Winnaar & Mosimege, 2017). Good quality curriculum materials can support teachers in making the crucial link between theory and practice; between what they know and believe and how they teach in the classroom (Stutchbury & Ngman-Wara, 2012). The use of quality teaching/learning materials should, therefore, be emphasized in the training of pre-service teachers. Research indicates that low achievement, especially in science subjects, may be due to lack of sound pedagogical skills of teachers and use of relevant learning resources (Wambugu, Changeiywo & Ndiritu, 2013; Kibos, Wachanga & Changeiywo (2015). The teaching/learning approaches commonly used in Sub-Saharan African schools are mainly expository in nature, thus encouraging learners to become passive recipients rather than active participants in the learning process (Orora, Keraro & Wachanga, 2014; Hassler, Hennessy & Hofmann (2018). Such approaches do not actively engage learners in the learning process and appear to deny them an opportunity to take responsibility for their own learning. Effective and meaningful learning of science at secondary school level is crucial in the preparation of learners for the world of work and successful living in the modern and technological society (Sailin & Mahmor, 2016).

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