

# **CHALLENGES FACING TEACHERS USING TEACHER EDUCATION IN SUB-SAHARAN AFRICA (TESSA) PRINT MATERIALS IN SELECTED SECONDARY SCHOOLS IN TANZANIA**

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## **INTRODUCTION**

Education is one of the key priority sectors specified in the Tanzania Development Vision 2025. It is considered to be an agent of change that is envisaged to transform the country into a middle-income economy (URT, 2011). Tanzania faces a critical shortage of science teachers in secondary schools. According to the Ministry of Education, Science and Technology (URT, 2016:89), there is an incredible deficit of teachers in Mathematics (7 291), Biology (5 181), Chemistry (5 373) and Physics (6 873). It follows, therefore, that the teaching of science subjects in Tanzania is wanting, implying a heavy load for these teachers, with some schools having none of these teachers at all.

The critical shortage of teachers in secondary schools can be attributed to the small number of qualified science teachers in schools that are able to produce students to enter teacher education, hence the limited number of science teacher graduates from colleges and universities. Another reason is the rapid expansion of secondary education following the implementation of the Secondary Education Development Plan (SEDP) I and II, consequently resulting in a mismatch between the number of teachers and the demand for science teachers in schools. There has also been a high attrition rate of teachers with a science background (URT, 2014). Finally, the teaching and learning environment in which science is taught is not favourable, partly due to a shortage of teachers, but also due to a lack of science laboratories and a lack of student interest in science subjects. The culmination of these factors has resulted in a limited number of science graduates at teacher education colleges and universities. The Teacher Education in Sub-Saharan Africa (TESSA) secondary science project is one of the interventions that aims to address this problem.



## TESSA SECONDARY SCIENCE PROJECT

The TESSA secondary science project was launched in five countries in 2010. It involved five participating institutions: Dar es Salaam University College of Education (Tanzania), Makerere University (Uganda), Egerton University (Kenya), University of Zambia (Zambia) and University of Education, Winneba (Ghana). The Open University of the United Kingdom coordinated the project.

The selection of the content was based on shared views from participating countries, reflecting the secondary science curriculum, focusing on common topics across member countries. The development stage included brainstorming and writing at different levels, reviews by the team, subject experts and classroom teachers, and versioning and customisation by individual countries for relevance and applicability.

The outcomes included the creation of open educational resources (OER) to support teachers of pupil-centred pedagogies in teaching science in secondary schools, the development of 15 units on five themes in different scientific contexts, increasing awareness of participatory pedagogies that teachers could use in other science teaching contexts and lessons emerging from extending the TESSA approach to secondary education.

### OER DEVELOPMENT

OER is now a popular means to offer education through the distance mode by offering easily accessible reference material for teachers and learners in diverse learning environment (Atkins, Brown and Hammond, 2007).

The TESSA material provides one module for each subject namely, Biology, Chemistry and Physics, focusing on the following five pedagogical themes: probing children's understanding and learning, making science practical, science lived (relevant and real), problem solving (creativity and innovation in science), and dealing with challenging ideas in science. TESSA developed this material under the Creative and Commons Attribution – Non-commercial-Share Alike 4.0 License, which makes the material openly accessible online. In addition to web-based access, TESSA materials are also available on CD and in print for circulation among member institutions. These options made it possible for the material to reach teachers in selected schools. The materials are accompanied by clearly selected case studies, activities and resources, customized to the national curriculum context.

## **PURPOSE OF THE STUDY**

The study explored the teachers' use of TESSA secondary science materials in classroom teaching and learning. It sought to establish the extent to which teachers in selected secondary schools were able to use the materials in teaching secondary school science subjects.

The following five key questions guided the study:

- What were teachers' views on the covered topics?
- How did teachers perceive the suggested teaching approaches?
- What areas needed improvement?
- Did teachers access online TESSA materials?
- What were the major challenges teachers faced?

## **METHODOLOGY OF THE STUDY**

The study employed a qualitative research approach, where interviews and observations were used as the main data-collection techniques. Three secondary schools in a typical rural setting in the Bukoba district were purposively selected for the study. A content analysis was performed to identify thematic areas and capture teachers' and students' activities during the lessons. Both teachers and students were informed of the purpose of the study.

## **RESULTS**

The findings of the study summarise the use of TESSA science materials and the challenges faced by secondary school teachers in selected schools.



## **Advantages**

The study revealed that teachers were happy with the coverage of the material and the good linkage between the practical and theory components of the subjects. The use of the materials also enabled teachers to gauge students' understanding of the content in different topics. The approach used also enabled teachers to support students' learning through case studies and activities, and made the learners learn independently through experimentation (Osaki, 2007). Teachers felt that the web-based materials would enable them to access the materials if they had computers at their schools. Teachers commended the TESSA materials, particularly in respect of the guidance provided on practical issues and the enhancement of students' interest in science subjects. Furthermore, teachers commended TESSA for bridging the gaps brought about by book shortages, and for enabling students to learn on their own in the absence of teachers.

## **Challenges**

The study revealed that only two out of seven participating teachers accessed the materials on the internet. Limitations related to funds and unreliable internet connectivity were experienced. Other teachers had limited familiarity with the internet, which posed a major barrier. Teachers were hopeful that printed copies, video copies for practical work, and soft copies on CD or a flash device for schools would provide suitable alternative means to access the materials.

## **CONCLUSION**

This study assessed the impact of the TESSA material in selected Tanzanian schools and revealed that teachers used the print material received and found it useful.

## REFERENCES

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