

## **Research Study I Would Like to Carry Out**

**Name:**

**Number:**

**Date:** 4<sup>th</sup> January, 2009.

**Title: Instructional Systems Design (ISD) Closing The Physical Science Gap.**

### **1. Selecting a Topic**

**Using e-Learning to increase access to and improve learner performance in Physical Science at secondary school level in Malawi.**

The topic stated above forms the basis for my research. The topic is directly related to my work, which involves monitoring and improving the quality of education provision in secondary, primary, and Teacher Training Colleges (TTCs). One of my concerns has been to find an alternative and accessible way of increasing participation and improving performance of secondary school learners in Physical Science. In this research I would like to explore how e-learning can be used to increase participation and performance rates of secondary school learners in Physical Science. The research will focus on design, development, delivery and evaluation of e-learning materials that can support self-learning in Chemistry (Physical Science) at secondary school level in Malawi.

### **2. Identifying the Research Problem**

Secondary education in Malawi is offered through Conventional (CSSs) and Community Day (CDSSs) Secondary Schools. The curriculum offered at this level designates Physical Science as one of the core (compulsory) subjects. Unfortunately, there is overwhelming evidence that Physical Science is not offered and studied in many secondary schools in the country. In the few schools where it is offered and studied, pupils still perform poorly in national examinations. Some of the reasons behind these problems are inadequate qualified teachers to teach the subject, understaffing and limited teaching and learning resources for the subject. This current status of Physical Science is therefore, becoming a major concern to government, education officials, learners and parents, hence the need for the study.

If this study is conducted, it will offer a flexible and alternative mode of accessing knowledge and skills in Physical Science (Chemistry) for secondary school learners. Currently, the only way learners can learn Physical science is through the face-to-face (traditional classroom teaching) which is limited to the few secondary schools. The

research will also assist the government to realize the principle of designating the subject as compulsory (core). Finally, the research study will provide an opportunity for more learners to enroll and do better in the subject during national examinations. This in turn may facilitate better understanding of science and technology among nationals which will create a fertile ground for technological advancement of the nation.

### **3. Literature Review**

In this research, supporting information will be from both electronic and printed database. The research study will draw on the understanding of e-learning and material design and development based on the principles of ISD models. Literature review of various books will also provide vital information on understanding the learning process of young people especially in a self-learning environment. Inspection reports and other policy documents from Malawi like the Policy Investment Framework (PIF) and on Malawi secondary sector education system will be studied to have a full understanding of the extent of the problem. Experience will also be drawn from related research studies in journals.

### **4. Stating the research Questions**

The following will be some of the hypothetical questions that will guide the course of the research study from the starting point:

- What will be the effects of e-learning on quality and access of education?
- Can secondary school learners learn through e-learning?
- How can e-learning improve the performance of learners in Physical science?
- How will the e-learning materials support self – learning?
- Can e-learning promote the intrinsic learning motivation factor among learners?
- What will the response of teachers towards e-learning and e-learning materials supporting self-learning?
- What are the educational and economic implications of adopting e-learning and e-learning materials that can support self-learning?

### **5. Determining the Research Design**

The research design will be largely descriptive. Data collection will be qualitative as well as quantitative in form of notes from observations, literature reviews, tests and interviews/discussions. Both formative and summative evaluation will be done to check the quality and effects of the e-learning material. In summative evaluation of quasi experiment, learners from both Conventional and Community day Schools will be used. Considering the time factor, prior arrangements with the Ministry of Education, Division

Offices and Schools with/without computers and teachers have to be made well in advance as the period of research falls outside the school calendar.

## **6. Determining methods**

It is planned that a total of 215 people will be involved in the research. 200 Form 3 learners will form 10 groups, (5 CDSSs & 5 CSSs), one teacher from each school (10 teachers), and 5 officers from the Inspectorate Department to observe and record learning proceedings. Materials and other instruments to be used are 1) the e-learning material itself, 2) Lesson observations checklist, 3) Test items and answers, 4) Questionnaire, 5) Structured questions for interviews and discussions.

Teachers will be allowed to conduct a lesson using a core blending approach to a group of 20 Form 3 learners. The exercises will be marked and results recorded. A questionnaire will be administered to learners and teachers to solicit their opinions. The supervisors will be evaluating the teaching and learning process using the observation checklist. In the final analysis, interviews and discussions will be conducted with teachers and Inspectors for more reactions. All the instruments will be brought together for qualitative and quantitative analysis. It is expected that tools used in previous research studies will be adapted in my research, failing which my supervisor's/mentor's expertise on construction and development of these tools will be needed.

## **7. Identifying Data Analysis Procedures.**

As stated in the research design above regarding data collection approaches; a combination of qualitative and quantitative analysis procedures of the collected data will be used. All transcripts will be organized and sorted out. Careful synthesis and coding of answers from questionnaires as well as field notes will be done to derive patterns and ideas for the research conclusions. Test results will be analyzed and effects of material deduced from them. Comments from learners, teachers, and inspectors will also form part of the basis for the research study conclusions. Experts in statistical analysis techniques will be consulted for guidance with the help of my supervisor/mentor.