1. Introduction:

With advances in learning technology and communication, information is expanding rapidly. In the past, books and teachers were the most frequent sources of information; nowadays there are many resources through which information can be disseminated such as CD Roms, the Internet and databases. Such sources are widely available, and are easily accessible. However, not all of these resources are available for free or with no or limited restrictions. It therefore becomes a challenge for some higher education institutes to provide affordable informational content for their students.

Open Educational Resources (OER) as defined by Atkins, Brown & Hammond (2007) are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others.

The guidelines for Open Educational Resources in Higher Education raise the importance of academic staff and students' contributions to the production of OERs in higher education institutes. They also shed light on the challenges and constraints that academic staff and students might have in this regard. The production of OERs can be possible through a process of sharing information among students and academic staff via interactive social networks such as wikis, weblogs and fora. The process of sharing knowledge is the underpinning of the social constructivist approach which maintains that knowledge is socially constructed.

The purpose of this initiative is to suggest an instructional teaching and learning Design (ADDIE) that could lead to the construction and dissemination of learning materials in a variety of electronic formats using Open Source Software such as Moodle. That is to say, it is an instructional design initiative for OER production.

2. Social constructivist Approach:

Constructivism, in general, maintains that knowledge is constructed by an individual, from within, rather than being transmitted to a learner from an external source.
Therefore, learning is seen as a process of actively constructing knowledge by integrating experiences together with the learners’ prior knowledge; the learner plays an active role in building his/her knowledge. Vygotsky (1978), the founder of social constructivism, emphasizes the importance of interaction with others such as peers, teachers, and parents in order to build knowledge. He also emphasizes the need for tools such as language and computers to mediate knowledge construction. Campbell (2004) argues that the best learning occurs in the middle of social interaction. The adoption of a constructivist approach in a technology-rich environment, promotes the full potential of technologies in producing and disseminating resources.

In a constructivist learning environment, students are engaged in active research and become managers of their own learning (Scott and Hannafin, 2000). Jonassen (1998) maintains that the learner has to be given the opportunities to process information, to ask questions, to solve problems, and to make decisions. Knowledge is not to be imparted to the learner, but acquired by the learner through an open inquiry process. King (1990) reports that students in a constructivist learning environment were engaged in both cognitive and metacognitive\textsuperscript{1} skills, as well as social skills. That is to say they were actively engaged in their learning. The employed Jonassen’s (ibid) four key opportunities. In this environment, learning is more collaborative and less didactic. The graphic (Figure 1) below shows students' active roles in knowledge construction:

\begin{figure}
\centering
\includegraphics[width=\textwidth]{Figure1.png}
\caption{Figure 1.}
\end{figure}

\textsuperscript{1} Metacognition refers to one's knowledge concerning one's own cognitive processes or, stated simply, thinking about thinking. The Metacognition process requires that learners take ownership of their learning and performance (Kanuka and Anderson, 1999).
A constructivist technology-rich environment imposes a new role on the teacher. Unlike traditional “top-down” teaching, Vygotsky (1978) advocates a bottom-up teaching approach wherein the teacher facilitates, as opposed to directs, what and how students learn concepts both in and outside the classroom. Within the learning environment teachers should play a major role in establishing the learning environment for their students supported by the use of various technologies. The teacher’s role is as a facilitator, coach, and co-learner. Her/His responsibility is to help and guide learners throughout their acquisition of knowledge (Phye. 1997). The role of providing guidance for learners, according to Vygotsky, includes the need to motivate them to excel beyond their current skills levels (i.e. activating learners’ zone of proximal development.). In addition, the teacher should possess ICT skills and knowledge of how integrate technologies into her/his teaching (Baker, Gearhart and Herman, 1994).

3. A Model of Open Educational Resources Construction:

This proposed model of instructional design is in line to some extant with the ADDIE model, one of the most popular instructional models in existence. Many eLearning professionals consider it the gold-standard instructional model. It has been examined extensively and used successfully by many instructional teams over (Bruce, 2002). The model involves the creation of instructions which illustrate how OERs are constructed and built by students and teacher/s through Wikis, in Moodle. The model promotes the use of information literacy skills as well as ICT skills. The American Library Association (ALA) defines information literacy as the ability to know:

- Determine the extent of information needed
- Access the needed information effectively and efficiently
- Evaluate information and its sources critically
- Incorporate selected information into one's knowledge base
- Use information effectively to accomplish a specific purpose
- Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally

ICT skills can be defined as the ability to use a wide range of communication and computer software applications, databases such as emails, text messages and social networking tools (wikis and blogs).
Wiki Tools:
Wikis enable students to collaborate on extensive writing projects. Because a Wiki is easy to use, interactive, and organized by date, it encourages informal discussion among the participants. This makes it a powerful tool for recording the thoughts and progress of participating students. It is a place to jointly contribute information in collaborative encyclopaedia like articles (Rice and Nash, 2010). Therefore, wikis and blogs are synchronous. They can be considered as tools to generate OERs.

Blog Tools:
ICT literature reveals that using a weblog can facilitate communication, pair/group work, and knowledge building and sharing. According to Richardson (2003), blogs are “a way to communicate with students…, archive and publish student work, learn with far-flung collaborators, and ‘manage’ the knowledge that members of the school community create.”
Weblogs also provide a means of delivering course content including syllabi, questions and other updates as necessary (Kajder & Bull, 2003). Students and instructors can use weblogs to cultivate ideas and share them online with colleagues and others (Glenn, 2003). Weblogs can also provide an electronic forum for reading, writing, and collaborating with peers and others (Kajder & Bull, 2003)

Learners' roles and Roles' of teacher:
In designing events, students are engaged in active research and become managers of their own learning (Scott and Hannafin, 2000). Knowledge is not to be imparted to the learner, but acquired by the learner through an open inquiry process.
The students were given the opportunity to process information, to ask questions, to solve problems and to make decisions.
Vygotsky (1978) advocates the teacher as facilitator, coach and co-learner. The teacher carefully scaffolds the learning environment for their students supported by the use of various technologies.

3.1 The model Stages:
The model consists of five stages during which the project will appear as OERs. Figure 2, below, depicts these stages:
3.3.1 Stage One: Analysis

Teacher and students negotiate and state clearly the topic (project) and the goals of prospective OERs. The target OERs could be part of course content with the intention of widening students' knowledge on a given topic. The project starts with stated teacher giving a briefing of what the project is about, doing brainstorming of a topic, discussing with students, and finally working with each group to decide on their research question. The interdisciplinary nature of the project comes from the research questions: students will choose a question that is personally meaningful to them. This brainstorming session can serve as a good technique to bring students' prior knowledge to a new learning experience.

Before students move to the next phase of their project, it is essential that the teacher reviews what students have brainstormed and what sorts of technologies and resources they have suggested to use in their project, to make sure that they are on the right track and have developed some questions for their research.

3.1.2 Stage 2: Accessing multimedia resources

Searching for more information about their topics, students list the resources that they are going to use. Students can access a wide variety of resources in different media and digital formats, i.e. photos, pictures, video, audio, and text. This engages students
in thinking about what types of media are suitable for their topic. Savage and Vogel (1996) argue that:

The addition of images or sounds to a traditional presentation naturally raises the question of which images or sounds to add and why. Those who develop even simple multimedia presentations are soon led to reflect on the criteria for using particular types of information, and this leads to identifying topics that may be presented better with these new tools.

Source: Jonassen, et al. (1999, p.86)

In short, students should learn to use the wide variety of resources that are freely available.

3.1.3 Stage 3: Development

Students process the required information using information skills thereby developing their understanding. They also can produce their own audio clips, video clips, pictures and computer-generated images as digital materials to support their research and reflect their newfound understanding.

3.1.4 Stage 4: Sharing and providing feedback:

At this stage students share their knowledge and understanding of the information they have processed of via blogs or Wikis. Different types of interactions that can take place during this stage: interaction among students themselves, interaction
between students and their teacher and interaction with their learning materials. These interactions can be both synchronous and asynchronous. The asynchronized interaction, according to Grabinger, Dunlap and Heath (1993) gives students chances to reflect on, evaluate, and summarize the acquired knowledge and experience, as well as to share it with others. Bowman (2001) argues that asynchronized learning allows students to reflect on and evaluate their learning process inclusive of self-assessment and self-criticism.

3.1.5 Stage 5: Publishing OERs

The posted information by students can be evaluated and corrected by teachers before it is disseminated to the others. This process might require a lot of editing by teachers and more constructive interaction might take place to validate the information. Then the link/s of the blog or wiki can be shared with students from all over the world to access these resources.

4. Conclusion

During these stages, both teachers and learners have important roles to play in producing Open Educational Resources. The teacher is seen as an important element in establishing, organizing and managing the learning environment; s/he provides scaffolding by guiding and assisting students with their learning. Students are actively involved in searching, organizing, analysing and presenting information. Throughout their project-work, they are engaged in metacognitive thinking, which is described by Chiquito (1995, p.211) as "involving thinking about or planning a learning process before the actual learning activity, monitoring the acquisition of new knowledge, or carrying out a critical self-evaluation of the results obtained after a learning process".
References


Grabinger, RS, Dunlap, JC & Heath, S 1993, Definition of learning environments, Paper presented at the Annual Conference of the Association for Educational Communications and Technology, New Orleans, LA.


