Can Moodle be used as a tool to educate the masses in Africa?

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Abstract

This paper aims to inform and persuade stakeholders in Africa so they support instructors by meeting their online basic needs because online instruction cannot be carried out in isolation. The report is based on a piece of research which was carried out from 2010 to 2013 in Rwanda. It will focus on a teacher training institute in Rwanda, Central Africa, where instructors have been trained on how to create, develop, and manage online courses in Moodle.

Firstly, the study will lay down background information which, in addition to literature review, highlights a needs analysis that was carried out by the institution and which found out that there was a great need to raise the effectiveness of instruction through Information and Communication Technology (ICT). Also, the institution wanted to meet the professional development needs of a growing teaching and student population by developing and using online educational materials beyond the classroom. Afterwards, the paper will evaluate the training, based on the project's expected outcomes i.e. development of training materials and introduction and use of online learning materials. It will draw on instructors' own Moodle experience, including online courses they have created on the platform and challenges they have faced during the implementation process. It will then recommend Moodle because it's an open source and is free to customise to any context. Furthermore, though there may be low hosting cost, it has a lot of potential to reach out and educate more people , develop learning and teaching beyond the classroom. Finally, it will make suggestions to stakeholders as to what needs to be done to support instructors and learners with a view to adopt Moodle, a growing online learning environment across the world.

Keywords

Online Learning in Africa, Moodle in Africa, Moodle in Rwanda.

Background information

African research suggests that many efforts have been invested in ICT infrastructure in Africa i.e. hardware, software, bandwidth, etc. (Masanja, 2010: 681). A recent report "*ICT for education: five years of learning"*, by the International Institute for Communication and Development (IICD, March, 2013) provides an account of best ICT practices in a few African countries. Examples include a computer skills training centre which was set up in Ethiopia for teachers from several schools to come together and learn to develop and share materials. The TIC-EDUC project in Burkina Faso has developed a mailing list for teachers to share knowledge, experience, and material online and offline according to the report.

In general, however, the investment is still limited i.e. limited telephone connections, low computer ownership (Boitshwarelo, 2009). In places where there is no Internet connection or low bandwidth, the IICD report (2013) suggests a solution. For example, it describes a project in rural Kenya where computer games have been installed on computers rather than accessing the game online. The game can also be suitable for computers without a large memory or fast processor. In rural schools where there is no Internet connectivity, ICT may not be the priority however according to the IICD report above.

There may be other ICT challenges in other African countries the author is not aware of but , according to another piece of research, little is happening in training/re-training of staff (Masanja, 2010). Let's now focus on the teacher training the author of this paper was involved in Rwanda.

Introduction and use of online materials in Kigali Institute of Education (KIE)

In 2009, KIE, a teacher training institution which created in 1999, successfully applied for an international funding to train teaching staff (N=50) on the design of online learning materials. The project aimed to improve the competences of the academic staff in ICT applications so they can get introduced to the design and use of

online learning materials. Therefore, the project targeted 50 staff , 14 women and 36 men. The selection criteria included the age (the average age was 35.26), basic ICT knowledge and skills and interest to learn. Most of them were tutorial assistants. It was integrated in the KIE strategic plan i.e. delivering a curriculum aimed to provide relevant and adequate subject content as well as pedagogical aspects to meet student's academic and professional component. Furthermore, the project aimed at shifting from traditional teacher-centred approach to a learner-centred approach in line with the ICT in education plan for the whole country. Some of pedagogical implications of a learner-centred approach are concerned with creating interactive materials that engage students in interaction with others and with the instructor, small group learning, adapting instructional content for an online delivery, etc. (Sife et al., 2007).

However, there were perceived constraints at the institutional level and among staff members. They were related to resistance to change(from a teacher-cantered approach to learner-centered approach, lack of computer skills , online security, insufficient power supply, heavy workload and slow integration of ICT in the education system.

Though KIE as a whole institution was faced with these challenges, the institution felt that it met the basic requirements for online instruction and training i.e. server in place as well as instructors , system administrator, computers with Internet access, browser (Sife et al., 2007; Cole & Foster, 2007; Nash & Rice, 2010). However, they needed external expertise which the author of this paper offered. Among other virtual learning environments like Blackboard, Moodle was selected because it affords more advantages as it's an open source, with free download, help and support from www.moodle.org though there may be hosting costs to bear. Furthermore, it's a course management system that universities, colleges, and individual instructors can use to integrate technology in their courses (Cole & Foster, 2008:ix).

Before the implementation started, Moodle was first introduced to instructors, faculty deans, instructors, and students and a sensitization workshop was held with a participation of about sixty participants from the whole institution (166 teaching staff). Then, over a three year period, the project was implemented i.e. about forty instructors were introduced to Moodle where they created and developed courses with a view to extend learning beyond the classroom and allow students to engage with the instructional materials any time, not just in class, while saving time for face-to-face time for questions and troubleshooting (Cole &Foster, 2008; Rice & Nash, 2010).

The instructors represented a wide range of departments, faculties and subject areas across the institution. Examples of real courses they have created include, among others, Introduction to geomorphology, counselling, introduction to oral literature, introduction to psychology, etc. although the courses were only accessible from the institutional intranet.

Instructors' Moodle experience

Below, screenshots demonstrate instructors in action. They are engaged in designing and developing Moodle (adding resources and activities see captions for details).

Figure 1 Moodle resources (Label: Geomorphology, description, image, etc.)

The teacher in figure 1, Vaillant, has created a course, geomorphology (GPHGEO) and has included a label (geomorphology in topic 1) with a question (how does the climate system work?).

Figure 2: Integrating resources (video and label)

Figure 3 Moodle activities (Forum)

Among other activities, Moodle forums are a virtual place for students and teachers to ask or discuss questions and share learning experience (Rice & Nash, 2010). The facilitator of the training created a forum for participants to engage with, and answer in the forum, questions regarding a book they were reading (Cole &Foster(2008). In figure 3 above, five representatives (see pictures and names in the second column and third columns) of the four groups were given feedback at different day and times.

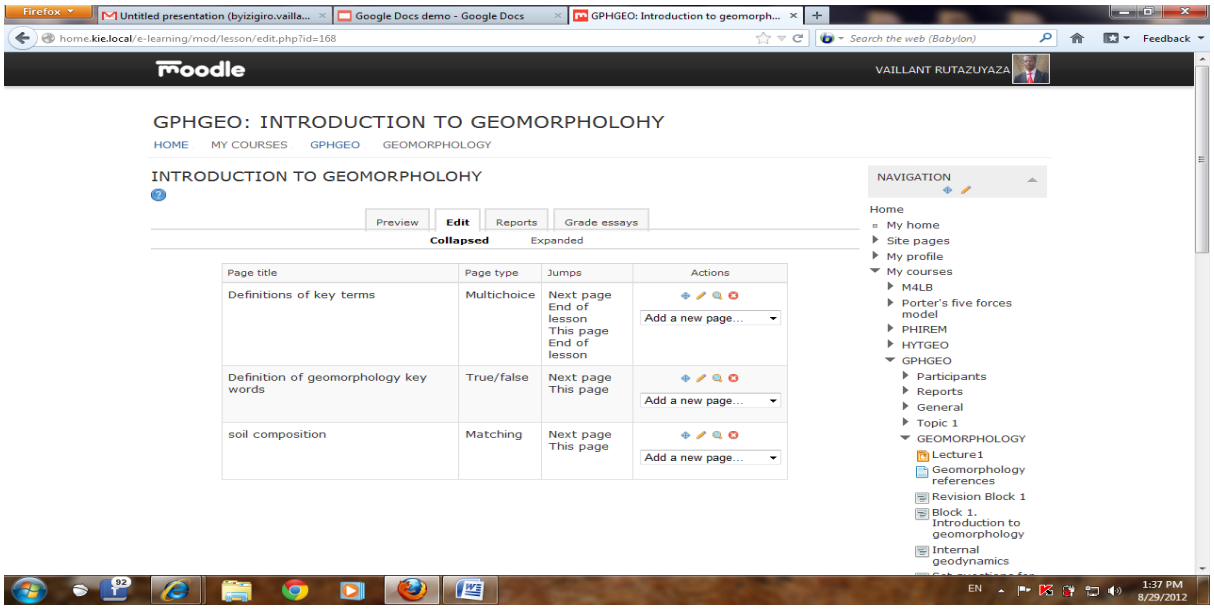

Figure 4 Moodle assessment (quizzes)

Self-assessment lets students observe, analyse and judge their performance based on criteria set by the teacher so they can determine how to improve performance (Rice & Nash, 2010). The teacher above (figure 4), has created quizzes in his course (multiple choice, true/false, and matching questions) which help students to become more engaged with the learning and assess their performance.

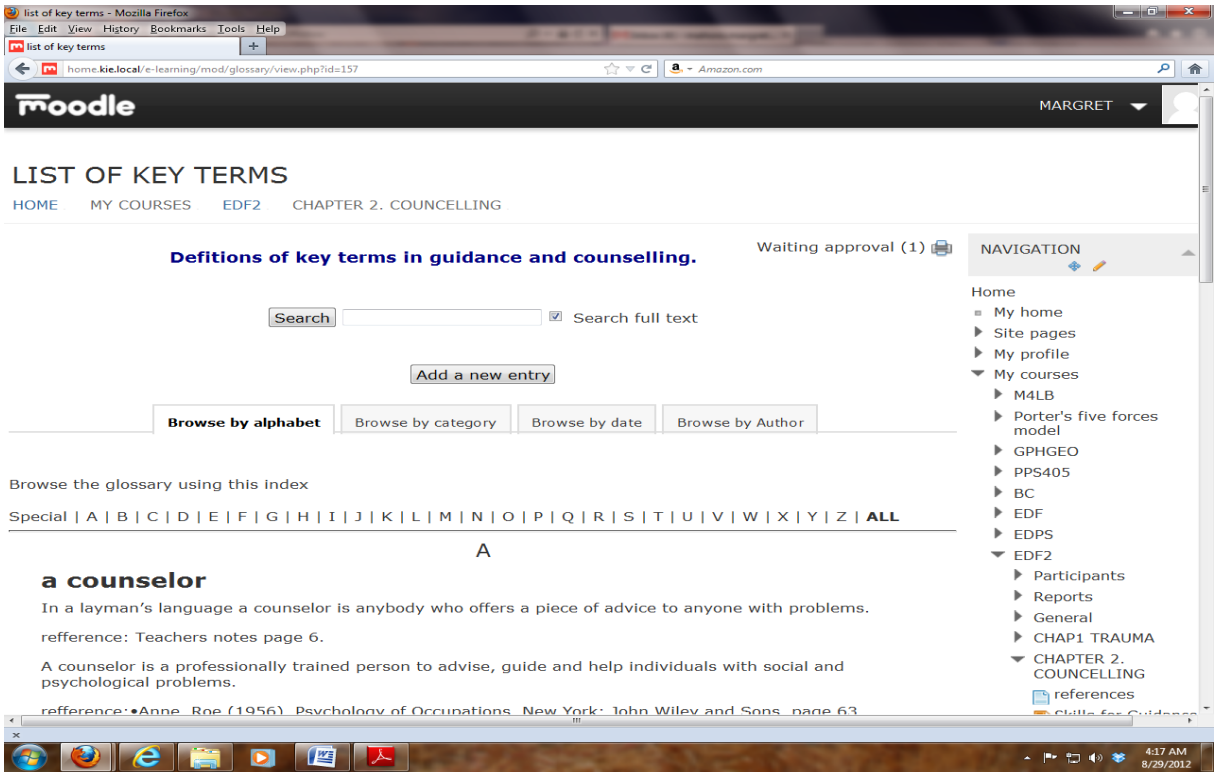

Figure 5 Moodle activities (glossary)

Another Moodle tool each teacher has embedded in their courses is a list glossary of terms(glossary) in connection with their subject area for students to develop vocabulary in their subject , communicate new ideas

with others, add comments or links to the definitions (Rice, 2008; Cole &Foster, 2008). In the case above, the teacher has created a glossary, including reference (see the bottom of the image above).

Evaluation of the training

There is no single correct way of evaluation as it takes many forms such as formative evaluation, which is an evaluation of a course or unit of teaching while in progress, and summative evaluation which is concerned with evaluation of a fully developed instructional system (Ellington et al., 1995). However, evaluation can be defined as

> "the collection, analysis, and interpretation of information about any aspect of a programme of education or training, as part of a recognised process of judging its effectiveness, its efficiency and other outcomes it may have" (ibid., p.148).

One way to evaluate a course is to look for outcomes (intended or not) in terms of skills, implementation problems, and operation of an instructional system and information can be gathered through different sources including questionnaires, interviews, observations, feedback from teaching staff involved in the instructional system(ibid. p.154).

Data collection methods

In order to find out whether the training objectives were achieved and the challenges instructors faced, a wide range of methods was used to collect information, including attendance registers which demonstrated over 90% drop out, informal chats with participants, one-to-one interview with instructors, and an informal evaluation was carried out at the end of the training. Additionally, they completed a needs analysis form before and at the end of each training session.

The needs analysis aimed at assessing the needs of each participant and setting goals to achieve by the end of each session. Participants were asked to put a tick before things they can do and a cross before those things they cannot do. They were also asked to specify any other relevant online learning experience they may have. They were asked to provide information about their Moodle experience. Let us have a closer look at two excerpt questions from the needs analysis form which are about specific Moodle experience questions.

Do you have experience using the Moodle platform or other online learning systems?

☐ I have much experience ☐ I have some experience ☐ I have no experience

other experience (please specify)

If you have experience with Moodle, how often have you used it in the past?

☐ Once a month ☐ once in three months ☐ once in six months ☐ once a year ☐ never

Other experience (please specify)

Other Moodle experience questions were related to Moodle access, enabling or exiting the edit mode, enrolling/removing users, reviewing settings, etc. Also, teachers were asked to say whether they can integrate, and engage in, communication activities (forum, chat, etc.) in their course, embed and manage collaborative activities (glossary, survey, etc), create multimedia resources (audio, video, links, etc.), create and engage in assessment activities (quizzes), and monitor users' activities. All the information was collated and an evaluation of the training was made.

Data analysis

Almost every participant (99.99%) said they have used Moodle once in six months but this was the last time they were being trained (this could not be checked against Moodle activity reports following technical problems). Concerning the question about Moodle experience, most participants said they had Moodle

experience though they could not remember the password. As a matter of fact, the password to the Moodle website had to be reset for all of them (the single most common problem instructors experienced).Two participants had used Moodle at other universities (one as student in a South African University and another as an instructor in a Kenyan University).

Participants' evaluation
Participants enjoyed constructing and sharing knowledge as mentioned in the following quotation.

- "Everyone was free to share their ideas so it was wonderful"
- "…I have shared experiences with colleagues on forum. I have also learnt how to set different kinds of quizzes on Moodle. I have learnt how to use videos, pictures, labels etc. in my lessons"

At the end of each seminar session, participants were asked to write a short evaluation of the training. To prompt them, they were asked to include in the evaluation things like peer interaction and interaction with the facilitator, peer support, and implementation of Moodle, etc .This is what some of them said:

- "The course was learner-centered; the teacher acted as a facilitator; learners were motivated and shared experiences";
- "Learners supported each other and learning was active"
- "The interaction between teacher and student and students-students was assured"

Moodle opportunities for instructors

Some participants made the following comments as far Moodle opportunities are concerned.

- "Moodle is very interesting and enjoyable for teachers"
- "the next step is implementation. We will need to brief other lecturers about Moodle. The institute has already taken the initiative of using Moodle, the remaining task is the implementation modalities"

As the participant above said, the institution organised the training i.e. the room was equipped with computers with Internet connection with appropriate software, a projector, etc. Moodle software was installed on the local sever though it could only be accessed internally. However, participants were faced with many challenges.

From the facilitator's point of, a training manual was developed and provided to instructors to guide them in the design of courses on Moodle. It was mainly inspired by Cole & Foster (2008), Rice (2008), and Rice & Nash (2010). It was also supplemented with other online resources such as Moodle teacher manuals (http://docs.moodle.org/22/en/Moodle_manuals) and other references.

Challenges to Moodle implementation

One of the complaints instructors raised informally and formally was that they have been even busier as the training was added on to their heavy timetable without any remission time as it can be realised on the reflections below from evaluation forms.

- "The training was organised when all trainees were overloaded with academic duties and they could not attend the whole session regularly…"
- " Participants are missing due to other assignments given to them"

Additionally, some instructors have articulated plans, fears and threats as follows.

- "Moodle is large but we will try to introduce it in our daily activities"
- "I intend to create my course online (on the Intranet).With the support of the institute technicians, my course will be followed by students …''

If Moodle is needed, can it be a solution to the problems?

Instructors made these recommendations in their comments.

- "Train more teachers to acquire knowledge and skills in Moodle"
- "Carry out a Moodle implementation in a given subject/department and implement it at the institution level";

According to research, Moodle has many benefits (free download, open source, and its ability to be used to teach a fully online course or to supplement a face-to-face course in a traditional setting (Cole, J.& Foster, H. (2007:ix). One instructor raised a similar point as follows:

> "Though everything about using Moodle is difficult, I was able to learn a lot ... for instance, organizing lessons, methodology such as scaffolding, assessment and grading of students"

However, there are many challenges particularly in Africa as some the participants have mentioned above. Research suggests that there is limited ICT infrastructure in Africa (low internet bandwidths, limited telephone connections, low computer ownership (Boitshwarelo, 2009). This point was mentioned in some instructors' evaluation of Moodle training.

- "Very interesting course but there may be a problem of implementation due to poor connection to the net, …students are not introduced to Moodle software"
- "The only threat will be inaccessibility by students to computers and internet connection"

Another research points that ''Africa lacks high-speed Internet infrastructures, access to computers, and human resources with the expertise to effectively implement and support hi-tech delivery methods'' (Aderinoye et al., 2009).

In Rwanda particularly, "the pace of development of a national ICT infrastructure is remarkable as is the progress within the education system on disseminating computers and providing connectivity and teacher training" (Farrell ,2007:418). Also, according to author, Rwanda has developed an ICT in education policy which is widely applauded (p.422). Despite a strong policy, there are implementation problems as one of the instructor said below.

> "I have, fears that I will not be able to use some of what I have learnt in Moodle in my lessons for several reasons: I have many students so it is difficult to cater for individual differences. Time is short to cover topics. In addition, few students have access to computers and internet connection. Also I feel I need a bit of training on how Moodle is used"

Suggestions to stakeholders in Africa

Research advocates that online education can fundamentally change the relationship between students and teachers with educational institutions according to the American National Education Association(NEA), in its 'Guide to Teaching Online Courses' (2006), for policymakers, administrators, educators, etc. The guide also suggests that online teachers be provided with technology infrastructure, technical and administrative support as well as educational support in order to succeed in an online environment. Technological support (software and hardware) should be provided .It is concerned with developing infrastructure to support online delivery for students and teachers, including networks and bandwidths to support Internet access, computers, space where teachers and students can have access to the course platform, etc.(NEA, 2006; Sife, Lwoga, & Sanga,2007). Instructors had to say the following about infrastructure:

> "The department/institution has to install all the equipment so as to start creating courses and students can be enrolled".

In addition to hardware and software, technical and administrative support should be provided to students and teachers in case they have problems (NEA, 2006; Sife, Lwoga, & Sanga,2007)

Another participant mentioned that there is a need to "create an atmosphere that can help lecturers to use Moodle program during their activities and the students to be motivated by having access to the Internet".

Administrative support includes a grading and registration system, student handbook, policies; etc.(NEA,2006; Sife et al.,2007).This is supported by one of the teachers in Rwanda who made the comment below. "Moodle can be implemented if they set a policy of working with students online."

Also, Moodle is suggested as it can be customised to meet the local contextual needs and it allows online peer interaction and discussion among students and teachers through such Moodle features as blog, chat, forum, etc. This way, it can supplement face-to-face instruction (Cole &Foster, 2008; Rice &Nash, 2010; Kesse, 2010).

Finally, I suggest educational support, online and face-to-face, for both teachers and students. It should include, among other things, release time for professional development, mentoring and peer coaching because teachers need guidance from experienced online instructors (NEA,2006;Sife et al.,2007).

Conclusion

The experience of KIE instructors quoted above has demonstrated that, despite some African government strong ICT policy, instructors are faced with many implantation challenges (heavy workload, too many students with individual differences to cater for in too short a time, poor access to computers and the Internet, poor connection to the Internet, etc.).These problems hinder online instruction and learning and Moodle implementation. For Moodle to be better implemented, it is extremely important to provide technological infrastructure, technical and administrative support. It is crucial that policy makers, administrators, etc. demonstrate a 'political' will by setting a policy and strategy in place at the institutional level, so as to create a viable and supportive environment for online instruction and learning. Otherwise, if such a will and support is not in place, instructors will be reluctant and unprepared to face the challenge of online education.

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