AN OPEN SOURCE SELF-ASSESSMENT PLATFORM AS TECHNOLOGICAL TOOL FOR DISTANCE AND OPEN EDUCATION LEARNERS

Simon-Peter Kafui Aheto
Cape Peninsula University of Technology, South Africa and University of Cape Coast, Ghana
kafuiaheto@yahoo.com

Johannes C. Cronjé
Cape Peninsula University of Technology, South Arica
cronjej@cput.ac.za

Dick Ng'ambi
University of Cape Town, South Arica
dick.ngambi@uct.ac.za

ABSTRACT

This paper explores the use of the WikiEducator E-quiz platform as an educational tool to enhance self-assessment techniques applied by distance and open education learners. Anderson's Model explains six different types of interaction: student-student, student-teacher, student-content, teacher-teacher, teacher-content and content-content. The model has a number of intertwining links with higher order thinking skills—analysis, evaluation and creating—of Bloom's Digital Taxonomy. Most of the learner-participants in this pilot study presented in this paper were privileged to have access to a computer, mobile phone and Internet, that enabled them to access, edit and add content to the E-quiz platform. A review of literature involved two main topics, namely self-directed learning and self-assessment. This study was qualitative in nature and conducted at a university in Ghana. Initially, Bower's affordances analysis was used to test the efficacy and appropriateness of the WikiEducator E-quiz platform for distance education. The affordances analysis not only assisted in analysing the platform and the tasks to achieve, but also identified the gaps. Learners who used the platform critiqued and reflected on the platform from their own perspectives. Two of the principal author's colleagues were instrumental in offering their opinions of the platform from a teacher's lens.

INTRODUCTION

Transformation through technology continuously enhances the ubiquitousness and massification of educational practices. One of the innovative ways of bringing education closer to the doorsteps of learners is through a Distance and Open Learning approach (Meyer 2014; Keegan 1996; Keegan 1980). Distance and open education learners are usually self-directed adults who face many learning challenges due to the unconventional nature of the course structure for learners who are geographically separated from their lecturers (Keegan 1980). In bridging the geographical gap, a number of measures are put in place as support system to assist the learners in achieving the learning objectives and learning experiences set out for them (Bates 2005). Some of these measures include online resources such as access to educational institutions' online libraries, modules (paper and digital formats), telephonic enquiries, emails, videos, and access to past question papers and sample questions.

To achieve good academic grades and enjoy a quality experience, it is incumbent upon every distance and open education learner that due diligence be applied to regular practice of learning tasks and self-assessment. Having practised as a course facilitator in distance and online education, the principal author made the observation that distance and open education learners' reliance on past and practice questions as well as case studies for self-assessment do not offer interactivity and instant feedback with the intuitiveness one would expect. Distance and open education learners do not have the luxury of meeting their lecturers in person to seek clarification whenever they need guidance with learning material (Simonson, Smaldino, Albright and Zvacek 2015; Keegan 1996). An interactive online self-assessment platform might assist in enriching these learners' educational experience while enabling them to work through a sufficient number of questions for practice.

The purpose of this paper is to explore an open source platform that enables self-assessment for distance and open education learners. The paper is directed by the following question: To what extent can open source self-assessment technology support distance and open education learners? The open source platform selected for this pilot study is the WikiEducator E-quiz platform, that is based on Bower's (2008) affordances analysis.

LITERATURE REVIEW

Educational Problem and Specific Context

With the increase in distance and open education, virtual learning platforms are becoming a necessity for almost every teaching and learning strategy employed by this mode of education (Kurilovas, Kubilinskiene and Dagiene 2014). In assessing the academic work of distance and open education learners, lecturers use a variety of questioning techniques that include multiple choice items, "fill in the gaps" and matching. To have a wide range of coverage and overview of content, distance and open education learners of the university involved in this study continue to rely on paper-based past questions, trial questions and case studies for practice. The majority of the learners have access to mobile phones, laptops and internet connectivity (Nyagorme 2014). Despite widespread access to technology, organisers of the course programme have not yet adopted any E-quiz platform to assist their learners with self-practice. An exploration into the use of open source E-quiz platforms stands the chance of improving the frequency of self-assessment and quality of learning outcomes by distance and open education learners who are self-directed (Aheto, Nyagorme and Mensah 2013).

Self-Directed Learning

Most distance and open education learners are self-directed adults and this reflects in the way they take ownership of their studies (Merriam 2001; Knowles 1975). Usually, course designs have not always favoured distance and open education learners in terms of learner support systems, especially when they are not on campus, compared to regular learners (Moore 2013; Moore and Kearsley 2012; Bates 2005). From the authors' experiences, distance and open education learners have often been treated as regular learners. The influence of technology on self-directed learners taking distance education programmes cannot be underestimated (Moore and Kearsley 2012).

As technology advances, distance and open education learners resort to a variety of media to support them in achieving learning tasks. Huang, Chandra, DePaolo and Simmons (2016) note that online platforms for learner support engagement are on the increase. Nonetheless, E-quiz platforms that encourage learners' participation in self-directed learning are virtually non-existent (Aheto et al. 2013). According to Prestera and Moller (2001), distance and open education learners gain satisfaction from self-paced and self-directed learning via a number of platforms with different kinds of methodologies.

Self-Assessment

Self-assessment becomes necessary whenever we question ourselves or self-reflect in order to measure what we have learnt (Boud 2003). Self-assessment is an important and effective way of learning in the life of every learner, especially distance and open education learners (Boud 2003). In their research findings in self-assessment, Colbert-Getz, Fleishman, Jung, and Shilkofski (2013) found that self-assessment sometimes increases learners' anxiety; however, females who self-assess perform better than their male counterparts. Self-assessment helps learners measure their progress of academic achievement (Costa 2004) through the analysis of set goals in terms of "specificity, difficulty and proximity; distinguishing between partial and final goals" (Siminică and Traistaru 2013, 6).

One limitation of self-assessment is the effectiveness of learners' self-assessment skills. Though self-assessment upholds the freedom that encourages learners to achieve their learning tasks, self-assessment remains an individualistic matter where much intrinsic or self-motivation is needed to achieve the requisite outcomes (Siminică and Traistaru 2013; Siminică, Circiumaru and Simion 2012). Unfortunately, learners are not guided in how to self-assess their learning.

In the literature search conducted, the authors observed that the potential of open source E-quiz platforms to promote self-assessment has not been explored. Considering the merit of such platforms, it could serve as the geographical link between learners, facilitators/lecturers and content.

METHODOLOGY

Part of the authors' methodology was conducting a literature review. Apart from revealing gaps in literature, the review, which was organised thematically, facilitated an understanding of the subject matter (Booth, Sutton and Papaioannou 2012). The six levels of interaction of Anderson's Model and the six thinking order skills of Bloom's Digital Taxonomy were applied to offer the educational experience of self-assessment for distance and open education learners.

In terms of interaction, educational experience involves three main actors: *learners, teachers* and *content*, on six levels: *student-student, student-teacher, student-content, teacher-teacher, teacher-content* and *content-content*. The six thinking order skills of Bloom's Digital Taxonomy (lower to higher) applied in this research are made up of *remembering, understanding, applying, analysing, evaluating* and *creating*.

The study was qualitative by means of a survey that included reflections of six second-year distance education Bachelor (Business) learners at a University in Ghana. The WikiEducator E-quiz platform was adopted for a pilot study with the selected learners for a semester in one of their courses. The six learners who were randomly selected formed part of a class of 36 learners who all held a Polytechnic

Higher National Diploma (HND) prior to pursuing their 3-year bachelor's degree in business. All the learners had access to computers, mobile phones and Internet connectivity (Ranker 2015). Access to technology were either personal or by means of their work place where computers, mobile phones and Internet connectivity were basic tools for their work.

WikiEducator E-quiz platform and how it works:

WikiEducator E-quiz is an open source platform used as a technological tool to facilitate learners' interaction and learning experiences on a distance learning education programme. The next sub-sections give an exposition of the platform.
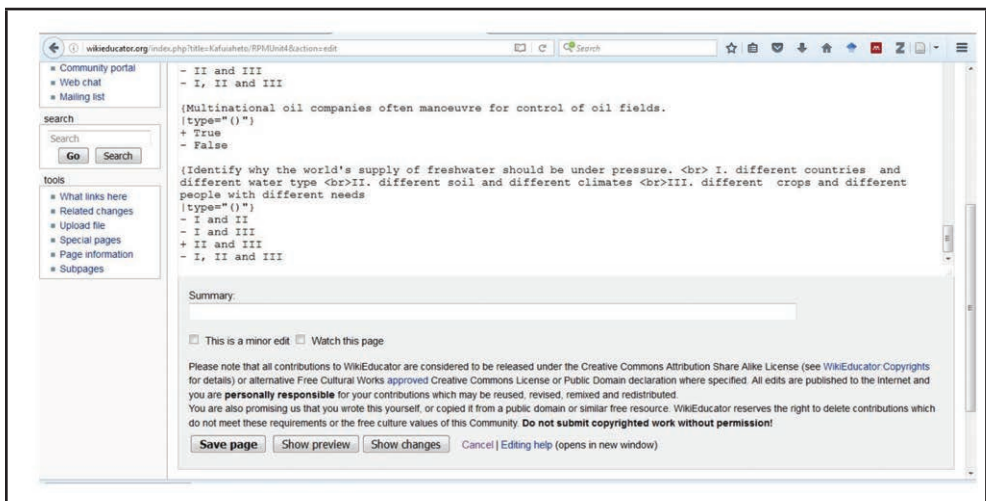
Back end page

Figure 1:   Back end of WikiEducator E-quiz platform

The back end of the platform allows the user to edit and reuse the content and codes. Subscribers to the platform can click on the "Watch this page" check box to receive real-time updates each time the page is updated. The "Save page" button allows users to permanently save their activities, especially after editing or creating new pages and content. The "Show preview" button allows the person editing the page to see how the interface would look like once it is saved; however, at this stage, the page is not saved. The "Show changes" also allows a person editing to see what changes have been made.
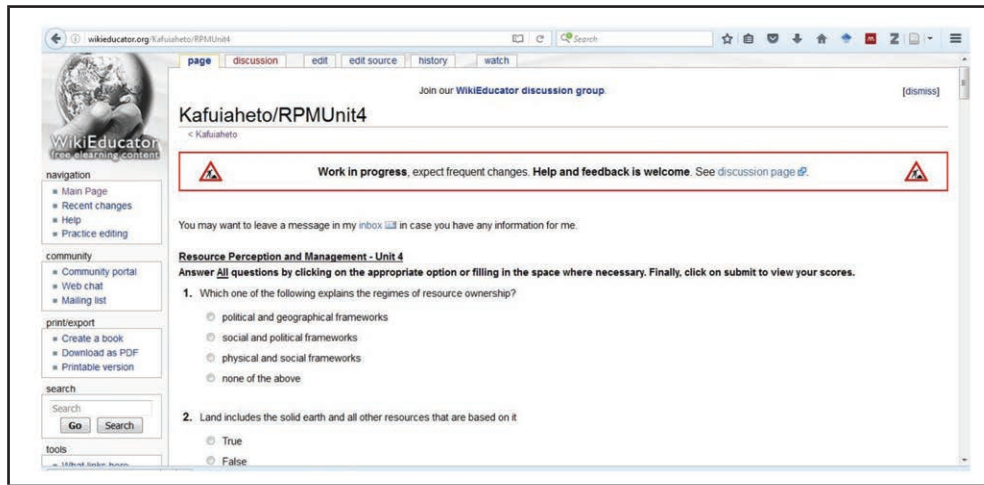
Opening page

Figure 2: Screenshot of the WikiEducator E-quiz opening page

The opening page allows learners to email the lecturer directly by clicking on "inbox". Learners can use the scrolling bar to reach the end of the page.
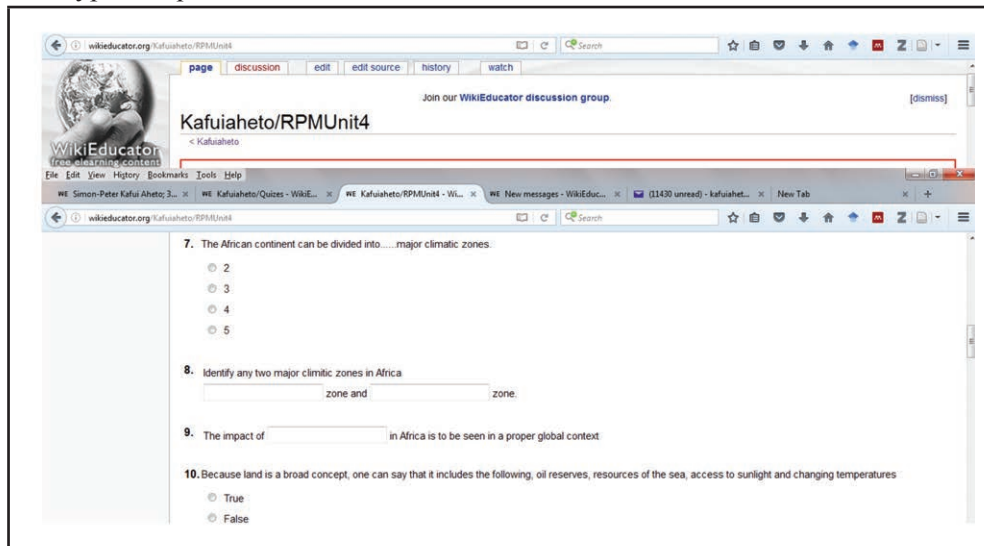
Types of questions

Figure 3: Screenshot of question types that can be used on the WikiEducator E-quiz platform

For this research study, only multiple-choice items and "fill in the gap" questions were explored. In future projects, other types of questions will be explored as well.
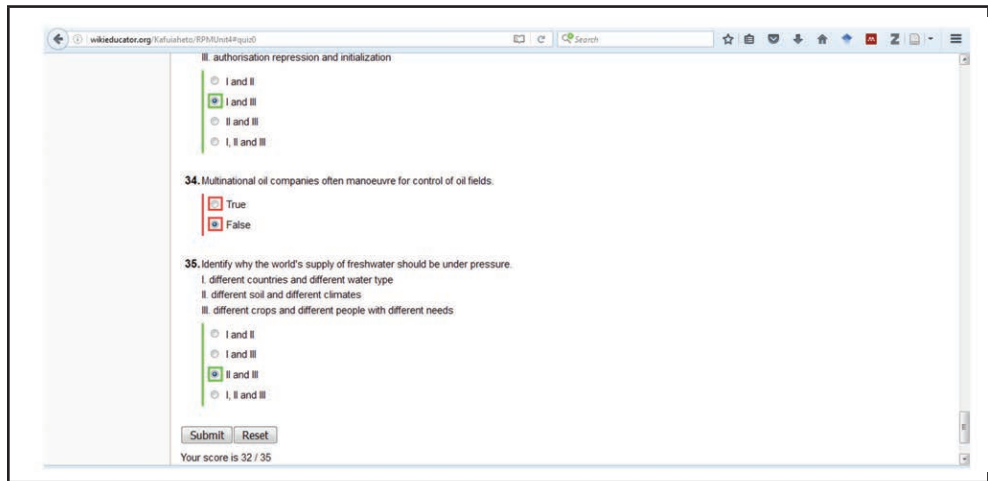
Feedback and scoring

Figure 4:   Screenshot of the WikiEducator E-quiz platform showing the feedback interface

One unique feature of the platform is the instant feedback, indicating whether a selected answer is correct, wrong or not answered as well as the exact scores of the correct responses. One particular quiz could be taken several times and at several locations by several users.

APPLYING ANDERSON'S MODEL AND BLOOM'S DIGITAL TAXONOMY TO WIKIEDUCATOR E-QUIZ PLATFORM

Anderson's Model

The key actors in Anderson's Model include the learner, teacher, content and type of interaction existing between each of them (Anderson 2008). Interactions among these key actors are at various levels: student-student, student-teacher, student-content, teacher-teacher, teacher-content and content-content (Anderson 2008). The interactions may take either asynchronous or synchronous forms. Anderson's Model has a major implication on the learning engagement of distance and open education students.
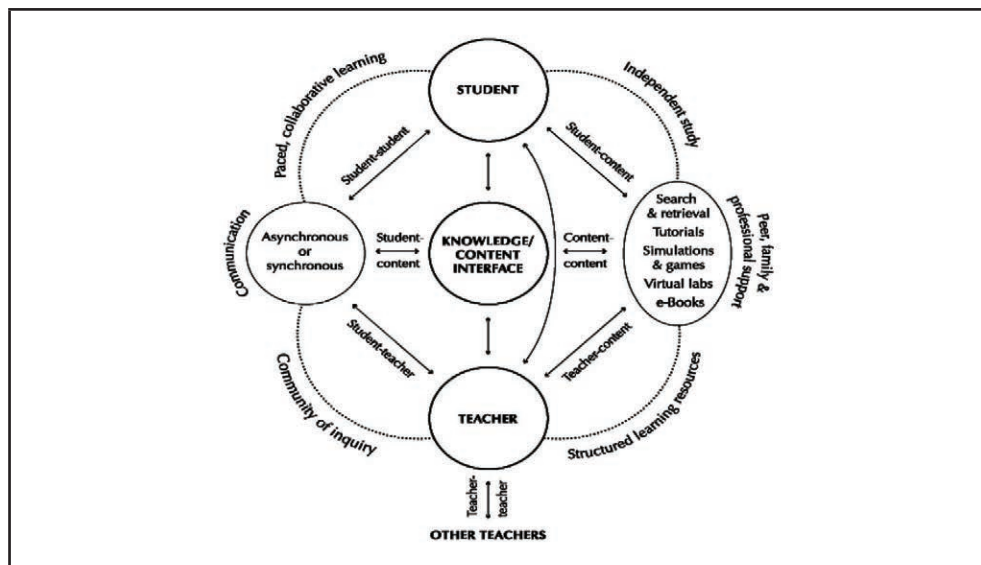
Figure 5: Anderson's Model (2008)

BLOOM'S DIGITAL TAXONOMY

Bloom's Digital Taxonomy gives a classification and breakdown of what learning outcomes or activities and thinking skills one should expect in every learning task (Churches 2009). The thinking skills, sub-divided into lower order thinking skills (LOTS) and higher order thinking skills (HOTS), describe "elements and actions" that can lead one to achieving a particular learning task or outcome (Churches 2009). The classification ranging from LOTS to HOTS are as follows: *remembering, understanding, applying, analysing, evaluating* and *creating* (Churches 2009; Krathwohl 2002). While some learning activities or learning platforms may offer all the thinking skills, others may not necessarily focus on everything (Prakash and Saini 2017). Figure 6 is a layout of Bloom's Digital Taxonomy.
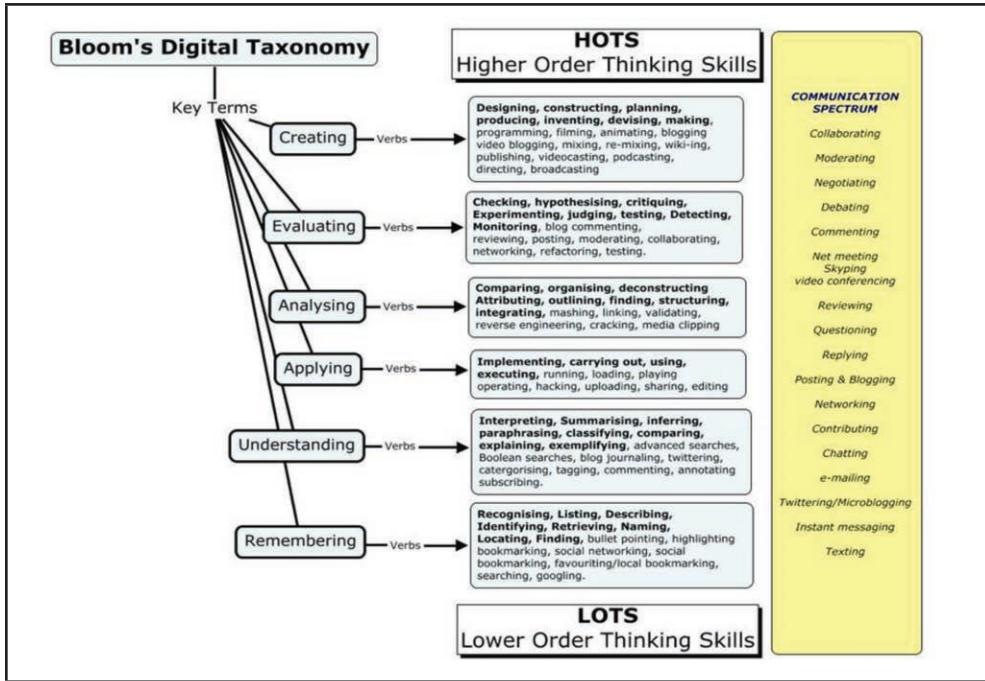
Figure 6: Bloom's Digital Taxonomy

(adapted from Educational Origami, cited in Munzenmaier and Rubin, 2013)

Table 1:   Matrix of Anderson's Model and Bloom's Digital Taxonomy in analysing WikiEducator E-Quiz platform for distance education

Anderson's Interaction level	Bloom's Digital Taxonomy Lower Order Thinking Skills <------------------>Higher Order Thinking Skills					
	Remembering	Understanding	Applying	Analysing	Evaluating	Creating
Student-Student	√	√	√	√	√	√
Student-Teacher			√	√	√	√
Student-Content	√	√	√	√	√	√
Teacher-Teacher				√	√	√
Teacher-Content				√	√	√
Content-Content	√			√		

Source: Authors

Student-Student Interaction, Bloom's Digital Taxonomy and the Wikieducator E-Quiz Platform

From Table 1, it can be observed that the WikiEducator E-quiz platform has the capacity to allow learners the experience of all the thinking order skills of Bloom's Digital Taxonomy at varied interaction levels. The creation of content, "wiki-ing", publishing and programming (Figure 7) are some of the higher order thinking skills that learners can acquire by using this platform. Figure 7 is a screenshot of the back end of the platform where content can be added, edited and designed. By doing this, learners may collaborate to obtain the same goal in helping each other to achieve the overall learning outcomes. All the other thinking order skills of Bloom's Digital Taxonomy are integrated in *student-student* interactions such as judging, deconstructing, executing, interpreting and recognising.
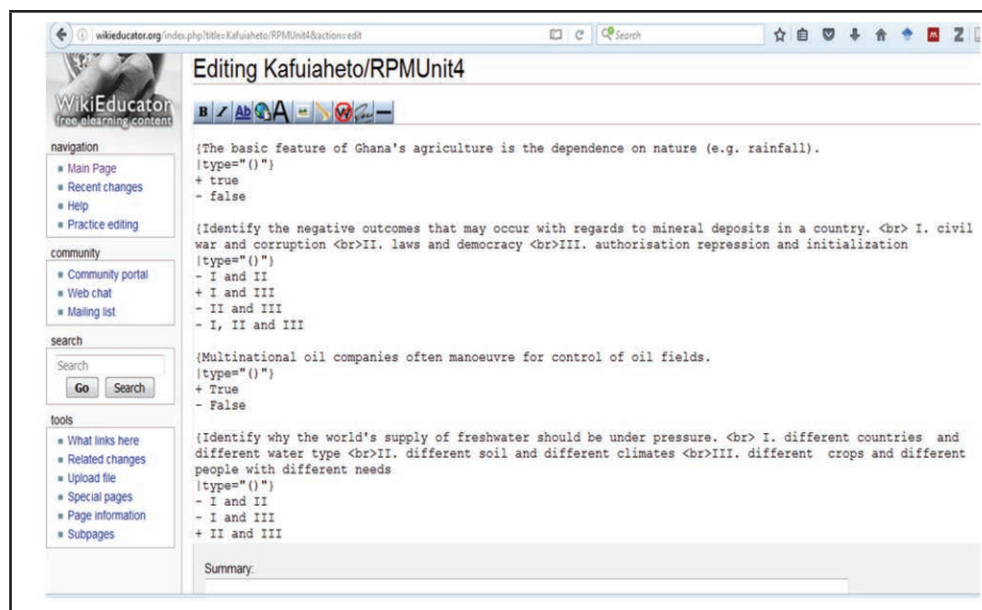

Figure 7:   Screenshot of backend of an example of WikiEducator E-quiz platform

Student-Teacher Interaction, Bloom's Digital Taxonomy and the WikiEducator E-quiz Platform

The proposed platform does not directly promote *student-teacher* interaction. The only interaction one can easily identify is an asynchronous way of communication. Since the platform is more of enhancing learners' ability to self-assess in a 'non-threatening' environment where a learner competes against him- or herself based on the feedback received after each self-assessment session, the proposed platform

keeps anonymous all persons who attempt answering self-assessment questions. The platform in its current state does not have chat pages that facilitate *student-teacher* interaction. However, traces of *student-teacher* interaction may be evident from the types of responses, outcome(s) and performances of the overall learning via WikiEducator E-quiz platform.

Student-Content Interaction, Bloom's Digital Taxonomy and the WikiEducator E-quiz Platform

The proposed platform can be best categorised under *student-content* interaction. Even though Anderson (2008, 58) describes *student-content* interaction as a very passive way of learning:

> "the Web supports these more passive forms of student-content interaction, and also provides a host of new opportunities, including immersion in micro environments, exercises in virtual labs, online computer-assisted tutorials, and the development of interactive content that responds to student behaviour and attributes",

and that such intuitive platforms which provide immediate feedback to learners support their learning significantly. The WikiEducator E-quiz platform keeps learners active and eager to achieve better scores each time they use the platform. As with *student-student* interaction, Table 1 shows the propensity to provide *student-content* interaction for distance and open education learners with all the levels of thinking order skills on Bloom's Digital Taxonomy.

Teacher-Teacher Interaction, Bloom's Digital Taxonomy and the WikiEducator E-quiz platform

The proposed platform is basically for learner self-assessment; nonetheless, *teacher-teacher* interaction could work effectively on Bloom's Digital Taxonomy for the highest order thinking skill, namely *creating*. Teachers, facilitators or lecturers could design and construct questions to help guide their learners. Distance learning programme teachers could collaborate to upload content and self-assessment questions for learners to "play" with. Teachers usually give tutorials and sample questions to learners for hands-on practice to master certain tasks. Anderson (2008, 59) notes that *teacher-teacher* interaction is usually on "professional development" levels.

Teacher-content interaction, Bloom's Digital Taxonomy and the WikiEducator E-quiz platform

Teacher-content interaction will only come to play in situations where distance education programme teachers introduce their learners to the platform and provide sample questions to learners via the platform. One way teachers can interact with the content is through creation and sharing of resources on the quiz platform. *Teacher-content* interaction does not necessarily imply a teacher's interest in who attempts the self-assessment questions or the progress learners make in terms of scores obtained on the platform. This supports the backdrop that adult and self-directed learners take ownership of their own studies and at their own pace (Ally 2004). Most importantly, this interaction will assist the teaching and learning process in such a way that the creation, design and structuring of content on the platform for learners will be possible.

Content-content interaction, Bloom's Digital Taxonomy and the WikiEducator E-quiz platform

The WikiEducator E-quiz platform is sufficiently intuitive to **remember** and return correct or wrong answers to individuals. It computes all scores and returns instant feedback in terms of final scores by interpreting and analysing the responses of the learner. However, the platform does not generate practice questions, neither does it have a question shuffling system.
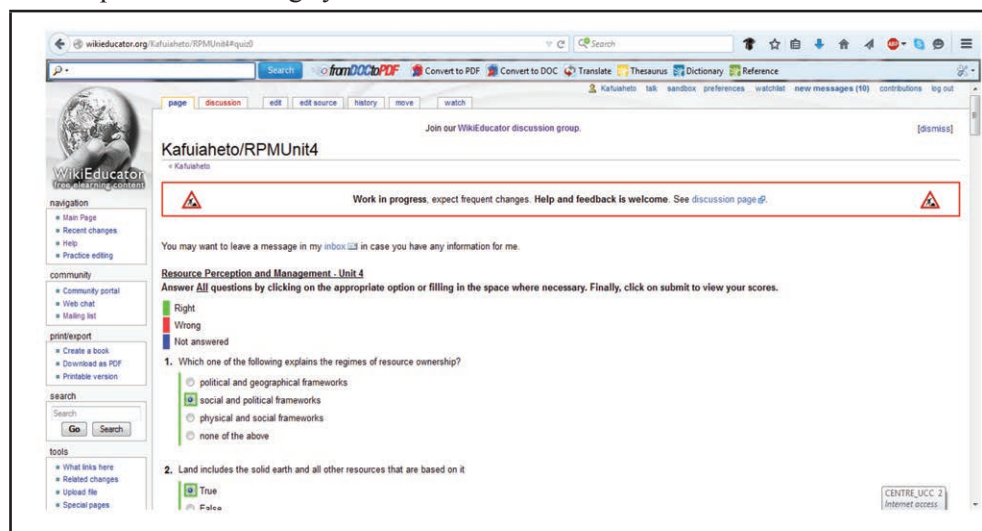

Figure 8: Screenshot of interpretation colour codes for scoring on WikiEducator E-quiz platform

AFFORDANCE ANALYSIS

In affordance analysis, Bower (2008) and Kirschner, Strijbos, Kreijns, and Beers (2004) noted that educational and social affordances contribute significantly to the affordance classification system.

Educational Affordances

Within the context of distance education, continuous practice and self-assessment by learners who are geographically distanced from their lecturers and facilitators is unavoidable (Boud 2003). A platform allowing some level of interaction and instant feedback is vital for the entire learning process. The WikiEducator E-quiz platform is open source. Learners, lecturers and experts in a particular field have the privilege of adding and editing content without considering the element of instant feedback, self-practice and self-assessment. One important characteristic offered by the platform is that learners do not need to login before taking a quiz, so that learners are encouraged to master a particular task through several sessions of practice.

Social Affordances

In a social context, the WikiEducator E-quiz platform promotes qualitative collaboration through contributions from its users irrespective of location. Although the platform does not have functionalities such as chats, the main focus is to encourage learners to practise, add and edit content, which promotes collaboration (Anderson 2008; Bower 2008). The merit lies in the platform encouraging purely academic sharing which is different from simply 'socialising'.

Technological Affordances

Having access to computers, mobile phones and Internet connection in the pilot study combined with the advantage of not being first time users of computers and wikis; the learners need not have wasted time on learning to navigate their way through the platform. The following technological affordances were offered (Bower 2008):

Media affordances – the platform allows for editing. Apart from text, it also allows audio, images and videos to be embedded which helped learners to grasp the concepts put across better.

Spatial affordances – objects such as pictures can be resized (but not moved) using the front end of the platform. Objects can only be moved through the back end of the platform.

Temporal affordances – the WikiEducator E-quiz platform is a web-based open source platform that can be accessed from anywhere, provided there is Internet connectivity. This feature enables learners to use content on the platform from any

location. Learners are not restricted to the number of times the platform can be accessed. The platform also has synchronous and asynchronous features that allow for instant feedback of tasks.

- **Navigation affordances** – the platform has hyperlinks that make navigation easier for end users. The links lead users to their preferred sections and sub-sections. The platform's search function works the same as any other search box.

- **Emphasis affordances** – Figure 8 shows how the platform enables feedback through highlighting correct, wrong and unanswered questions.

- **Synthesis affordances –** the platform has the ability to integrate tools that do not originally come with it. These tools may include videos, images and plug-ins to promote teaching and learning.

- **Access-control affordances** – the platform is open to everyone, who are free to use the content on the platform as long as they acknowledge the source. However, one can only edit or add content if she/he registers on the platform. Copyrighted content is not allowed on the platform except when proper citations and permissions are duly acknowledged. The links and content can also be shared any time by anyone.

- **Technical affordances** – the WikiEducator E-quiz platform is ubiquitous in nature. It works on all browsers and does not have to grapple with large bandwidth.

- **Usability** – the platform is user-friendly with general tools used every day on other web platforms.

- **Aesthetics** – users are at liberty to design and redesign the platform and elements such as the interface. The interface is similar to the *Wikipedia* platform.

- **Reliability** – the WikiEducator E-quiz platform can be used by a number of people from different locations at the same time, and this will in no way affect the other users.

Among the technological affordances discussed, media, spatial, temporal, access-control, technical and reliability affordances speak directly to activities linked to distance and open education learners in achieving quality learning outcomes and experiences.

REFLECTIONS FROM LEARNERS AND FACILITATORS USING THE WIKI-EDUCATOR E-QUIZ PLATFORM

Six of the 36 learners who used the platform shared their experiences in using the platform as a tool for self-assessment. In general, all of them found the platform to be an extremely useful tool for self-assessment and self-practice. Some of the learners requested that the platform be extended to cover all their courses. These requests are quoted below.

Learner 1

> I wish this platform is available for all the courses we have registered for in this semester. I don't need to wait for far too long before I get certain basic concepts clarified by my friends. I got the fundamental meanings of certain concepts which I now apply directly in my company.

Learner 2

> Why are we getting introduced to this nice educational tool only at this time? I am sure our performance would have been better if this tool was introduced to us during our diploma level. I commend the authorities for this initiative. No time to waste, all other subjects must also have their own question and answer bank for us to use for our self-assessment. It is not easy to be a distance learner if you do not get some of these supports.

From the voices of the learners the value of the *student-content* interaction as cutting edge across Bloom's thinking order skills, is revealed. At least Learner 1 confirmed that the platform allows for understanding, applying and analysing concepts learnt through self-assessment. In evaluating the platform, Learner 2 discussed content creation through the creation of questions and answer banks. This suggests that *student-content* and *teacher-content* interaction can also occur at the highest level of thinking skills, i.e. *creating* using an E-quiz platform.

The need for intuitive platforms supporting learners to achieve learning tasks and learning experiences are not only perceived by learners. The work of facilitators is also enhanced during evaluation.

Colleague 1

> This is a very great initiative to encourage learners [to] do self-assessment before they face exams...most learners don't do well because they never try their hands of practice questions. Sometimes, they feel lazy to do so; others too don't create the time to do so. With this platform, learners can practice and practice and practice, even on their mobile phones.

From the literature, self-motivation, which emerged as an attribute of self-assessment (Siminică and Traistaru 2013; Siminică et al. 2012), resonates as reflected on by one of the learners.

Learner 6

> This is just fantastic. What amazes me is that I don't need to be chasing all those paper-based past questions. All I need to do is to launch the link to the platform site, answer the questions and then no-one even knows about my progress.

Learner 6 has confirmed research conducted by Merriam (2001) and Moore and Kearsley (2012), demonstrating that distance and open education learners engage in self-directed learning. Some suggestions, considered to be gaps by the participants, were evident in their reflections:

Learner 5

> One major problem with this platform is that it does not give you continuous details about your progress as you work. I need to know about my progress and a statistics on that can help all of us. Apart from that I will say that the platform is helpful.

Learner 3

> I look forward to a day where we will use similar platforms for our main exams from the comfort of our homes. The instant feedback helps me to work towards my mistakes.

The learners have confirmed that despite the need for interaction with content, at each of the thinking order levels formative self-assessment is preferred. This also falls within the category of support systems for self-directed distance and open education learners (Moore, 2013).

Colleague 2

> Can there be a way of linking their progress of self-assessment to our databases such that they can gain some points for that? Sometimes it is good for us to know how our learners organise their time for learning purposes. Linking this platform to our databases can also help our learner counselling activities.

Colleague 1

> A chat plug in can also encourage a number of the learners to use this platform. I realise that if they are not on Facebook, then you can easily find them on WhatsApp or Twitter. We have to really go all out to embed some of these things in such kind of learning designs.

From the perspective of the facilitators, teachers want to have oversight responsibility of learners' progress with self-assessment. Although tracking learners' progress with self-assessment platforms may assist non-performing learners in terms of remedial

programmes by teachers, it will destroy the element of learners taking ownership of their learning. This, in conjunction with Learner 6's view that the E-quiz platform enables learners to take control of their progress without anyone tracking it, shows alignment to *student-content* interaction at the level of *understanding* and *evaluation* thinking skills.

SUMMARY

This paper sought to explore and suggest ways in which the WikiEducator E-quiz platform could be used as an educational tool to enhance self-assessment techniques applied by distance and open education learners. Anderson's Model and Bloom's Digital Taxonomy were discussed to determine how the two models can converge to offer an educational experience with the WikiEducator platform. Anderson's six interactional levels—*student-student, student-teacher, student-content, teacher-teacher, teacher-content* and *content-content*—were matched with the six thinking order skills of Bloom's Digital Taxonomy, namely *remembering*, *understanding*, *applying*, *analysing*, *evaluating* and *creating* using a matrix as indicated in Table 1. It was established that the *analysis*, *evaluation* and *creating* of higher order thinking skills of Bloom's Digital Taxonomy matched with almost all of the levels of interaction in Anderson's Model. A brief literature review under the subheadings "self-directed learning" and "self-assessment" was done. Educational affordances, social affordances and Bower's affordance analysis were also applied. Eleven aspects of technological affordances were discussed to confirm the appropriateness of the WikiEducator E-quiz platform for distance education. The affordance analysis contributed in identifying gaps should the platform be adopted for use. Finally, reflections from the learners who were involved in the pilot study were presented. The reflections included the experiences, suggestions for future improvement, and critiquing of the platform, all in the interest of enhancing the WikiEducator E-quiz platform for distance and open education learners. Two colleagues were approached for their opinions on the platform from the lens of a teacher and based on their work experience.

CONCLUSION

The WikiEducator E-quiz platform was explored for use by distance and open education learners for self-assessment and practice. From the literature it was found that self-assessment supports learners to perform better. However, E-quizzes have not been explored in literature as a tool to support distance and open education learners, even though most learners do have access to tools and internet connectivity that can be used to enhance the quality of learning outcomes and the ability to self-support. It was further found that one of the advantages of open source E-quiz platforms

includes learners' lively interaction with content and facilitators. The creation and sharing of content are highlighted for open and free usage.

RECOMMENDATIONS

Providers of distance and open education should consider open E-quiz platforms to fill the geographical gap in which learners find it challenging to engage with self-assessment. Further research on similar open source E-quiz platforms could prove to be useful to triangulate results found in this study.

REFERENCES

Aheto, S-P .K., P. Nyagorme, and P. A. Mensah. 2013. *Using WikiEducator to Improve the Academic Performance of Distance Education Students: Evidence from Centre for Continuing Education, University of Cape Coast*. Proceedings. The Second International Conference of Design, Development and Research. Kumasi, Ghana: Kwame Nkrumah University Science and Technology 172-189.

Ally, M. 2004. Foundations of Educational Theory for Online Learning. *Theory and Practice of Online Learning* 2: 15-44.

Anderson, T. 2008. Towards a Theory of Online Learning. *Theory and Practice of Online Learning* 2: 15-44.

Bates, A. W. 2005. *Technology, E-learning and Distance Education*. New York: Routledge.

Booth, A., A. Sutton, and D. Papaioannou. 2012. *Systematic Approaches to a Successful Literature Review.* London: Sage.

Boud, D. 2003. *Enhancing Learning Through Self-Assessment.* London: Kogan Page.

Bower, M. 2008. Affordance Analysis–Matching Learning Tasks with Learning Technologies. *Educational Media International* 45(1): 3-15.

Churches, A. 2009. Bloom's digital taxonomy. http://edorigami.wikispaces.com/Bloom%27s+Digital+Taxonomy (accessed April 11, 2015).

Colbert-Getz, J.M., C. Fleishman, J. Jung, and N. Shilkofski. 2013. How do Gender and Anxiety Affect Students' Self-Assessment and Actual Performance on a High-Stakes Clinical Skills Examination? *Academic Medicine* 88(1): 44-48.

Costa, A.L. 2004. Assessment Strategies for Self-Directed Learning. Thousand Oaks, CA: Sage.

Huang, X., A. Chandra, C.A. DePaolo, and L.L. Simmons. 2016. Understanding Transactional Distance in Web-Based Learning Environments: An Empirical Study. *British Journal of Educational Technology* 47(4): 734-747.

Keegan, D. 1996. *Foundations of Distance Education*. New York: Routledge.

Keegan, D. J. 1980. On Defining Distance Education. *Distance Education* 1(1): 13-36.

Kirschner, P., J-W. Strijbos, K. Kreijns, and P. J. Beers. 2004. Designing Electronic Collaborative Learning Environments. *Educational Technology Research and Development* 52(3): 47-66.

Knowles, M. 1975. *Self-Directed Learning: a Guide for Learners and Teachers*. United States of America: Cambridge Adult Education.

Krathwohl, D. R. 2002. A Revision of Bloom's Taxonomy: An Overview. *Theory into Practice* 41(4): 212-218.

Kurilovas, E., S. Kubilinskiene, and V. Dagiene. 2014. Web 3.0-Based Personalisation of Learning Objects in Virtual Learning Environments. *Computers in Human Behaviour* 30: 654-662.

Meyer, K. A. 2014. Quality in Distance Education: Focus on On-Line Learning. *ASHE-ERIC Higher Education Report*. Jossey-Bass Higher and Adult Education Series.

Merriam, S. B. 2001. Andragogy and Self-Directed Learning: Pillars of Adult Learning Theory. *New Directions for Adult and Continuing Education* 89: 3-14.

Moore, M. G. ed. 2013. *Handbook of Distance Education*. Mahwah, NJ: Erlbaum.

Moore, M. G. and G. Kearsley. 2012. *Distance Education: A Systems View of Online Learning*. Belmont, CA: Wadsworth Cengage Learning.

Munzenmaier, C. and N. Rubin. 2013. *Perspectives Bloom's Taxonomy: What's Old is New Again.* Santa Rosa: The eLearning Guild.

Nyagorme, P. 2014. *E-Learning adoption and utilisation: a comparative study of Kenyatta University, Kenya and University of Cape Coast, Ghana*. (Unpublished Doctoral thesis). Kenyatta University, Nairobi, Kenya.

Prakash, L.S. and D. K. Saini. 2017. *Instructional Design Technology in Higher Education System: Role and Impact on Developing Creative Learning Environments*. In Handbook of Research on Creative Problem-Solving Skill Development in Higher Education. IGI Global: 378-406.

Prestera, G. E. and L. A. Moller. 2001. Organizational Alignment Supporting Distance Education in Post-Secondary Institutions. *Online Journal of Distance Learning Administration*, 4(4): http://wp.westga.edu/wp-content/uploads/sites/40/ojdla/winter42/prestera44.pdf (accessed February 10, 2016).

Ranker, J. 2015. The Affordances of Blogs and Digital Video. *Journal of Adolescent and Adult Literacy* 58(7): 568-578.

Siminică, M., D. Circiumaru, and D. Simion. 2012. The Correlation Between the Return on Assets and the Measures of Financial Balance for Romanian Companies. *International Journal of Mathematical Models and Methods in Applied Sciences* 6(1): 249-256.

Siminică, M. and A. Traistaru. 2013. Self-Directed Learning in Economic Education. *International Journal of Education and Research* 1(12): 1-14.

Simonson, M., S. Smaldino, M. Albright, and S. Zvacek. 2015. *Teaching and Learning at a Distance*. United States of America: Information Age Pub.