Social Media Integration into Problem Based Learning in Universities

Julius Murumba, Elyjoy Micheni

Abstract: The current generation of students in universities is made up of digital natives who prefer to use social media to socialize and interact. Many Universities have introduced Problem Based Learning (PBL) and appears to be of growing interest particularly where such learning requires computer supported collaborative working. This article examined the current state of problem based learning in Kenyan universities and investigated the social networking technologies frequently used, factors influencing integration of social networks into PBL and challenges faced. The study is carried out through an examination of scientific research papers in journals and conference proceedings, and from online journals and reports. The paper concludes that integration of social networking technologies into PBL is necessary to enable use of real world problems or situations as a context for learning. The paper recommends that Institutional leaders should recognize the opportunities that social media and the Internet offer to problem based learning and develop supportive policies, and academic members of staff need to provide an educational context that enables students to integrate social media academically, especially in PBL

Index Terms: Social Media, Problem Based Learning, Universities

I. INTRODUCTION

Many universities in Africa are recognizing the educational value of the Internet and social media in augmenting teaching and learning purposes. Social media has provided new possibilities and ushered in a new era of teaching and learning that is student centered in a technologically and socially rich environment. [1] state that learning in today's world needs to be implemented with new sets of structures through the internet that utilize new and emerging technologies in order to provide the level of learning provision needed for the 21st century. The widespread adoption of social networking technologies mainly for social interaction in universities has meant that these technologies are within reach of majority of students and are easily accessible. These technologies can therefore afford university academic staff ability to convey concepts in new ways that are more efficient and effective if used [2]. [3] observe that social networking technologies can further offer learners a greater degree of control over their learning pace and experiences. Social media users can share information and knowledge among themselves freely, synchronously or asynchronously. There are numerous types of social media,

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many of which are not fully developed leading to situations where faculty members worry about the negative aspects some social media could have on learners. These fears not withstanding there are developments which offer possibilities for the intelligent use of social media in education [4]. Social media is defined as those technologies that facilitate social interaction, collaboration, and deliberation across stakeholders, and comprise of technologies such as blogs, wikis, multimedia media sharing tools, virtual worlds and networking platforms e.g. Face book and twitter [5]. Social media has not only fundamentally changed the way communication takes place in university communities, but also has the potential to transform how learning takes place and the roles of students and teachers in the learning process [6]. Similarly, [7] states that social media has the potential of reinforcing class material and positively influencing student's collaborative work, knowledge construction , and stimulating critical thinking skills.

Problem-based learning is described an approach to learning that encourages active learning through creation of environments and tasks informed by social-constructivist learning theory, and are an alternative to traditional instructional approaches [8]. This instructional method helps learners to be independent, and able to continue their learning and to solve their problems in their entire life. Problem Based Learning (PBL) has gained recognition as an instructional model that engages students in investigations of compelling problems that culminate in authentic solutions A PBL learning approach typically starts with an authentic, semi-structured problem that requires students to develop expertise in information seeking and decision-making to solve problems. PBL is therefore believed to enhance students' critical thinking skills, increase motivation and improve social skills through group work. In many cases, the realistic problems used in PBL studies may not have a right or wrong answer. [9], state that PBL works through five cognitive areas to stimulate learning. These are: 1) Activation of the students' prior knowledge 2) Elaboration of prior knowledge through cooperative discussions 3) Restructuring of knowledge to fit the problem presented; construction of an appropriate semantic network through internal discourse. And 4) Learning in the scaffolding context of a real-world problem. Institutional characteristics in favour of integrating Information Technologies, such as social media into PBL include strategic plans, investments in a robust Information Technology infrastructures and training sessions on the use of technologies in pedagogy.

Institutional cultural characteristics too should ideally be in favour of integrating Information Technologies in PBL and evidenced by adequate levels of support given by university leadership. In majority of the universities a significant number of academic staff members have adopted the constructivist approach to teaching and learning, while making effort to incorporate use of Information Technologies.

II. OBJECTIVES

i) To investigate the social networking technologies frequently used in Universities
ii) To establish factors influencing successful integration of social networks into PBL
iii) To establish challenges faced in integrating social media into PBL

III. METHODOLOGY

To achieve the study's objectives, an investigation was carried to collect and analyze information on the integration of social media in problem based learning. Information and Literature gathering was done over a period of two months beginning January 2017. A systematic collection and analysis of data on the uptake of social media technologies by university communities and consequent integration in problem based learning was done. Sources of literature reviewed included scientific research papers in journals and conference proceedings, reports and strategic plans from various universities and from online journals and reports.

IV. SOCIAL NETWORKING TECHNOLOGIES IN UNIVERSITIES

Information Technology can help create an active environment in which students can learn by solving problems. Social media in particular, can offer powerful tools that transcend the traditional classroom learning. This can be achieved by providing video-based problems, computer simulations and digital communication platforms capable of connecting classrooms with instructors, and with communities of practitioners in various fields such as science, mathematics and engineering irrespective of the distance or location [10]. The wide range of electronic tools that social media provides are useful in PBL for problem structuring, analysis, planning, design and information sharing in ways that enables learners to perform sophisticated and complex tasks and solve problems in creative ways [11]. [12] Observed that the various forms of social media are mostly internet based tools and technologies which have audio and visual capabilities comprising of capturing, storing, connecting and retrieving features. [13] Noted that universities that are encouraging use of Information Technologies, including social media in teaching and learning find that problem-based learning is a natural approach to integrating technology into the curriculum. The successful integration of social media is however influenced by teachers' knowledge, experience, approach to teaching and learning, and information technology literacy skills. The extent to which social media is

integrated into PBL is influenced by institutional and cultural characteristics of universities, by being accommodative to use of technologies in learning. Many universities have in recent years improved their Information Technology technical infrastructures and have modernized their computer labs with high speed internet connectivity to increase student access. Social media has presented universities the capability of promoting virtual communities that can interact and communicate freely and many educators are already exploring and experimenting with these tools in learning methodologies such as PBL [14]; [15]; [16]. Social media has the ability to serve as a critical tool for information searching, organization and analysis of data, and presentation of solutions. Table 1 below presents some social networking technologies that are being used by university communities and their uses. Social Media is among the technologies that can support problem based learning by offering sources of information that would otherwise not be available, providing tools that can help students manage and organize ideas, information, data and results and a multitude of ways to present their findings [17].

V. THE CONSTRUCTIVIST APPROACH TO LEARNING

Trends of the last few years indicate that educators are increasingly being urged to adopt a variety of constructivist approaches in order to facilitate student-centered learning environments [18]; [19]. PBL involves learners working in small groups to solve authentic problems using resources that have been made available to them [20], and the role of the instructor is to facilitate and provide scaffolds and coaching, and models the kinds of meta-cognitive strategies and questions which students are then expected to do on their own. The instructor acts as a guide or adviser as students explore the issues involved, formulate questions, conduct research, and consider possible solutions to the problems. Each problem cycle concludes with a reflection phase, in which learners discuss the efficacy of the information obtained and their solution strategies [20]. From [9] perspective, Problem based learning is a constructivist method of teaching which enables students to learn content knowledge and problem-solving skills through investigating and finding.

Table 1: Types of Social Media that can be used in PBL: Adapted from [4]

Tool	Example	Educational Application Areas
Weblogs	Distance and E-Learning Resources such as Moodle, WebCT	Allow instructors and students to communicate easily; Students can make regular postings
Wikis	Wikipedia, Wetpaint	Open collective publications capable of allowing students to collaboratively create knowledge
Content tagging	MERLOT, SLoog	Content areas are one method that schools use to organize knowledge, teaching, and academic programming. For example, learning standards, standardized tests, academic teams, graduation requirements, and faculty departments are often organized by content area
Really simple syndication (RSS).	Yahoo News, Feed Reader, Google Reader, Bloglines,	Allows users to subscribe to news feeds originating either from blogs and web spaces like newspapers and magazines. This enables content to come to the reader instead of the reader having to retrieve the content.
Social networks	Face Book, Twitter, LinkedIn	Connects students with their friends and enables interact sharing of study and work
Multi-media	You-Tube, Podcasts, Open Courseware's, e-portfolios	Allows students to access, create, store, download and share information in various multimedia forms
Multi-player games	Lord of the Rings Online	Students can compete or collaborate against each other or against third parties represented by the computer, in real time
Mobile learning	Mobile phones and apps such as wats app	Ubiquitous access for students to multiple information formats in multimedia form

Solutions for ill-structured problems. Well designed problems or projects encourage active inquiry and higher level thinking, and as consequence students become more engaged in learning when they have a chance to dig into complex and challenging problems that resemble real life problems [21]. When it comes to designing projects in PBL, students typically have choices which allows them to pursue their interests and engage their curiosity, and in the course of answering their own questions, they are likely investigate topics not identified by the teacher as learning goals. True learning in the 21st century requires students to be able to use the new and emerging Information Technologies, including social media in a variety of ways such as enhancing memorization of facts and for problem solving in real world settings [22].

VI. PEDAGOGICAL IMPLICATIONS OF INTEGRATING SOCIAL NETWORKS INTO PROBLEM BASED LEARNING

Social media has become an everyday communication medium for both learners and academic members of staff, and is therefore only logical that universities incorporate its use into instructional approaches. According to [7], by integrating social media technologies in PBL, the task of knowledge construction can share by the instructor, students, and other individuals in industry who share an interest in the subject. Social media also provides students with opportunities to participate in societal, economic, cultural, civic, and educational matters, and therefore offers students opportunities for social inclusion. Well designed project based learning supported by Information Technology tools, including social media can significantly enhance students' ability to enhance their understanding levels and concepts of

subjects and enable them to construct solutions to complex and real world problems [23]; [24] Face book for example has primarily been known for social networking, but is now also being recognized as a respectable learning platform [25]. Among the ingredients of successful use of social media in pedagogy is use of up-to-date, real and authentic data rather than contrived data that young people cannot relate to, for example the use of Twitter in math's or status reports of academic functions [26].

A report by [27] indicates that in 2015 the internet penetration in Africa stood at 42% with 545.5 million people being connected, and generally the use of social media has becoming increasingly important in many African countries. Kenya's Internet penetration for instance was at 64% in 2015 [27] and social media had become an effective tool through which Kenyans use to write on topics of interest to them, and exercising their freedom to free speech as guaranteed by law. According to [28] statistics from the Communications Authority of Kenya in 2016 indicated that Kenya had over 90% mobile penetration with mobile subscriptions reaching 39.7 million, while Internet subscriptions grew by 8.2% to 26.8 million with majority of Kenyans connecting via 3G or better connections. In addition Google's Consumer Barometer [28] indicated that Smartphone uptake in Kenya in 2016 stood at 44%, and on the internet usage of the smart phones Social media dominates with 58% of the users, search engines with 39%, email with 30% and video with 25% which was deemed remarkable given that bandwidth and data bundles are expensive in Kenya.

Additionally [29]; [30]; [31] indicated that Face book was the biggest social media platform of all in Kenya with approximately 5 million active users, followed by WhatsApp which is chatting platform estimated to have 10 million users and Twitter with approximately 1.7 million users. Other Popular platforms were Linkedin with 1.5 million and Instagram with 3 million respectively while Blogs enjoyed a continued of growth. This indicates that social media use is widely accepted and can therefore be integrated into pedagogical practices at the tertiary level in Kenya.

Today's university students are exposed to numerous types of technologies in many aspects of their lives with social media ranking among the most widely used technologies by the students. The students typically aged 18 to 24 years are commonly referred to as Generation Z (Born: 1995-2012), and have the largest percentage of social media use and expertise [5]. This generation of students frequently uses desktop computers, laptops, cell phones and iPads to actively engage in social networking, text messaging, online content sharing and blogging implying that these technologies can be engaged for academic practice. Social media therefore has capability of engaging students in online learning communities using technologies familiar to and accepted by their generation. In fact many students have expectations that use of social media may correct some traditional problems associated with group projects such as unequal participation [32]; [5]; [7]. When these social media technologies are combined with web 3.0 technologies, they can offer students the capability to both create and receive content and therefore leads to an emergence of collective intelligence. This in turn improves students' learning experiences and prepares them to enter a workforce with skills necessary for the 21st century workplace, for example highly developed online collaboration skills [7]. Academic members of staff are also using social media, as an example there are some who have experimented with using blogs as a pedagogical strategy, which can offer new opportunities to enhance academic instruction and student learning experiences [33]. Students too have learned that they can use blogs and Twitter to keep all team members more and fully engaged in the projects [7]. A study on social media use by university students in Kenya [24] revealed that 72.6% among students use the internet for doing their assignments and enriching class notes, similarly 72.6% felt that they were always looped because they got instant information on everything that. Additionally 83.6% among the students indicated that social media had made access to class notes and other relevant information easier by using tools like Drop box and Google Drive; 46.6% among the students said Skype and other video conferencing tools enabled them to connect and have discussions with their lecturers and group members from any location in the world. This shows that social media is currently highly cultural relevant for young people and harnessing these tools for education can develop powerful contexts for learning. Tools such as Face book, Xbox and Google Docs (Google Apps for Education suite) may be useful in achieving real time collaboration [26]. [7] States that in order to use social media in pedagogy academic staff members must create time and opportunities for use of these technologies into their course syllabi, since these may provide alternative ways to cover many topics; and that Social Media Usage Agreement Terms and Conditions should be observed. Under the terms students should be expected to act safely by keeping personal information out of their posts, use social media as an academic resource only and behave as though they were in a classroom, and not to respond to comments that make them uncomfortable, but rather report such comments to their instructor promptly. Many universities are today utilizing podcasts, you tube, and webcasts to share information on the work of students and academic staff members.

VII. FACTORS INFLUENCING SOCIAL NETWORKS INTEGRATION INTO PROBLEM BASED LEARNING

An empirical study by [34] reveals that socio-demographic factors such as gender and age have significant influence on student's behavior in adopting social media for learning in universities. Majority of the students tend to be technically savvy and very experienced with the use of social media and internet technologies. Perceived ease of use, perceived usefulness and perceived social pressure are predicators found to have a significant influence on the adoption of social media for learning and teaching in universities. This means that students use social media tools such as Wikipedia in learning because they think they are useful [35]; [34]. Academic staff members have realized that social media technologies add a new dimension to teaching effectiveness in PBL by enabling them do things that might not have been possible within the traditional classroom [36]; [10]; A study by [42] revealed that majority of academic staff members were comfortable interacting with students on social media for academic purposes, and that incorporation of social media into learning activities by the lecturers was largely influenced by their attitudes and perceptions. Social media technologies can help create active environments in which students can solve problems. These environments are mainly created by the powerful tools offered by social media for overcoming logical constraints through provision of digital communication systems, computer simulations and multimedia-based problems with capabilities of connecting classrooms with communities of practitioners in many fields such as science and mathematics in different geographical regions. Social media has the potential to offer better support for problem-based and collaborative learning processes [33], and is therefore an effective way of increasing the engagement of students. This is achievable when appropriate measures are put in place. Social media is tool that may be exploited to build communication skills of students by allowing them to feel comfortable expressing themselves in a less intimidating environment, improve communication between students and their instructors and improve the employability of students through use of social media to establish professional Web presence, posting a resumes, and searching for potential employers [5]. Social media has also gained in prominence as a suitable tool that enhances the learning environment by stimulating retention,

and can be adapted to the diverse backgrounds of students. This indicates that these technologies are well suited for adoption into PBL. [37] Investigated the effect of an instructional approach, which was student-centred instruction and found a significant increase in performance, retention and attitudes. Academic staff members have had additional motivations for use of social media in PBL; these include opportunities to create professional contacts and collaborations with colleagues, industry and with students [38]. The benefits of integrating social media into problem-based learning are widely documented and students are motivated to perform well or better on standardized assessments and excel in higher-level thinking skills over time. [17] Adds that when social media is integrated into PBL, students become more involved in their course work and more proficient in self-directed learning, team participation and problem solving. The benefits of social media as stated by [39] are inclusive of the following: Increasing chances of student-to-student collaboration; Increased student motivation for learning and engagement with course work; Enhanced interaction between the student and the lecturer/ teacher; accelerated data and information sharing; removing barriers to self-expression and contribution; and providing students with 21st Century skills which could boost their employability and increase levels of satisfaction. When social media and web 3.0 technologies are integrated into PBL the following benefits may be realised; 1) integration of multimedia technologies and visual aids to make learning interesting, engaging, and interactive 2) consistent delivery of content made possible synchronously or asynchronously 3) expert knowledge can easily be communicated or captured 4) technology can be adapted to students' different learning styles 5) broadening the scope of learning.

VIII. CHALLENGES IN SOCIAL NETWORKS INTEGRATION INTO PROBLEM BASED LEARNING

There are suggestions that there are serious risks when it comes to using social media for learning purposes. According to [5], a significant number of educators and instructional designers believe that social media technologies are neither appropriate nor successful vehicles for teaching and learning activities. This emanates from assertions that social media is not well developed to suitably manage processes such as student enrolment, course descriptions, lesson plans, assignments and exams; and may therefore not be well suited for problem-based learning activities. [40] asserts that in Kenya like in most developing countries use of Information Technology in pedagogy is largely for purposes of computer literacy training; and that the present Information Technology curriculum largely deals with teaching about computers and not how computers and related technologies can be used to transform the teaching and learning in learning environments. Observation's in the education sector according to [40] show that where teachers have been trained in the use of Information Technologies, integration of the same in teaching subjects remains weak because of reasons such as absence of systematic institutional management support; Lack of ownership of Information Technologies by learning

Institutions; Lack of integration into existing curriculum; heavy academic staff work overload; and lack of incentives and motivation. Suitability and appropriate integration of social media technologies into the PBL remains a major challenge. [5] Holds the view that social media technologies should be integrated seamlessly into the curriculum rather than being just an additional means of communication for the integration to be deemed successful. Third-party Web-based innovations have also been cited as a major concern for many universities because the information is stored outside secure campus servers. This may be against the institutional and cultural characteristics of some institutions and the security of learning materials that are proprietary could be compromised as well. Other issues limiting use of social media for academic practice in PBL result from time constraints of academic members of staff in relation to heavy workloads, privacy issues, technical difficulties, lack of adequate Infrastructure e.g. slow network connections and unreliable power supply, cyber security, cyber bullying, lack of appropriate assessment strategies in the usage of social media, and distractions [5].

XI. CONCLUSION

This paper discussed the type's social media technologies frequently used in learning environments of institutions of higher learning, the factors influencing use of these technologies and challenges encountered. The integration of social media in PBL offers learners the flexibility and ability to create new knowledge and new learning communities, while at the same time provide ability to revisit content as needed. These emerging technologies when combined with web interfaces are clearly moving the education community closer toward Tim Berner-Lee's ideal of using the Web as an information space through which people can communicate by sharing their knowledge in a pool [41]. The paper recommends that Institutional leaders should recognize the opportunities that social media and the Internet offer to problem based learning and develop supportive policies, and academic members of staff need to provide an educational context that enables students to integrate social media academically, especially in PBL. Social media technologies should be appropriately selected for incorporation into the teaching and learning programs of PBL since this opens up opportunities for online collaborative inquiry and self-directed learning. This is because many of these new and emerging technologies are interactive, making it easier to create environments in which students can learn by doing, receive feedback and continually refine their understanding, and build new knowledge. These technologies can also provide access to a vast array of information such as digital libraries, data for analysis, tools for organizing ideas such as concept maps, presenting ideas for example blogs and access to people who provide information, feedback and inspiration. This means that any integration of social media should consider learning pedagogy for PBL, the patterns of student use of social media, and the extent to which such technologies may be used in PBL programmes. Academic members of staff need also to be conversant with these technologies and learn

how to use them to enhance their learners' understanding and critical thinking skills.

APPENDIX

Appendixes, if needed, appear before the acknowledgment.

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