Baraton Interdisciplinary Research Journal (2018), 8(Special Issue), pp 1-7

INTEGRATING TECHNOLOGY WITH PEDAGOGY IN THE CLASSROOM THROUGH THE SMART PHONE: A CONTENT ANALYSIS

Vencie Allida
Fletcher High School, Gweru, Zimbabwe

Dhliwayo Alice *
University of Eastern Africa, Baraton, P. O. Box 2500-30100, Eldoret, Kenya
*Corresponding Author: Email address – vencieallida@yahoo.com

Technology has become the by-word in education, in fact, it has permeated all facets of life to the extent that ignoring it in the classroom may result in products that are not fit for the global village. Most countries in Africa and globally, acknowledge that they cannot provide a 1:1 learner computer ratio. However, learners in the same locality especially in the urban and peri-urban own smart phones which are powerful hand-held computers. This research set out to find out what other countries in Africa and elsewhere have done so far in terms of integrating pedagogy with technology through the use of the smart phone in the classroom using content analysis method. The researcher looked at some countries in parts of Africa, South Africa, Zimbabwe and the United States of America. This corpus-based descriptive study followed a five step process of qualitative data treatment: (i) collection of related data (ii) organization of data (iii) data coding (iv) identifying themes (vi) interpreting the data. The findings of the study suggested that African countries have poverty and inconsistent internet as challenges in integration in education. Increased advancement towards technology integrated learning in their education systems may be speeded up by incorporating the smart phone. This is so as to combat the need for computer hardware and connectivity.

Keywords: Technology; smart phone; integration; pedagogy

Introduction

Smart phones are a reality in schools and they cannot be ignored. Where they are banned, teachers spend the greater part of the day in running battles with learners as they smuggle them in somehow (Parsons, 2014). Teachers and parents want results, for these are tools for placement and further education. Smart phones are perceived by many as disruptive and unproductive in the classroom yet they have become an extension of learners' hands and minds. In the USA, some teachers refer to the smart phone as the "new chewing gum" which has become a nuisance, yet others have adopted an 'if you can't beat them join them,' attitude accepting that smart phones are not going away any time soon therefore, it would be better to adopt them as a learning tool (Wilson-Strydon & Thompson, 2011).

There are conflicting responses from teachers and stakeholders in terms of smart phone use in the classroom. In the USA, in some schools, phones were banned in 2013 and GCSE results for that year doubled, on the other hand, new research from the same country claimed that more harm than any good resulted from banning phones from the classroom (Knapton, 2016). Some districts in Chicago claim that after lifting the ban and with some control, learning outcomes are showing the benefits of allowing smart phones in the classroom (Parsons, 2014).

Traditionally, schools in the USA banned or limited the use of phones in the classroom, however, in a survey, teachers reported that their learners use smart phones for learning activities in the classroom (Higgins, 2013). According to Higgins (2013), in the Township High School District 113 of Chicago, teachers are taking advantage of the teaching and learning opportunities that smart phones offer for the classroom. It is increasingly becoming a reality for stakeholders in education that smart phones provide a platform for innovation and creativity in education which cannot be ignored.

President Obama in 2013 initiated the ConnectED program aimed at connecting 99% of American students to broadband internet within five years of inception (Clark, 2013). This was an initiative done intentionally to empower teachers with skills to integrate pedagogy with technology in the classroom and individualizing learning for students through digital

content (ICEF Monitor, 2013). This therefore would culminate into a 1:1 learner - computer ratio at classroom level to meet the initiative's projection of increased access to upgraded internet connectivity, digital content and devices.

The ConnectED initiative came up with a pledge a year later called the Future Ready District Pledge (Office of Educational Technology, 2014). This is a commitment to digital learning that had to be signed by all superintendents of educational districts across the USA at the White House, pledging to collaborate and work towards digitalization of education as stated in the connectED initiative blue print (Office of Educational Technology, 2014). In response to the presidium initiative, 44% of schools in the USA have embraced the Bring Your Own Device policy (BYOD) with documented success, to meet the targeted 99% connectivity and individualized digital learning for students (Freed, 2017). According to a recent survey, the ConnectED initiative is on course having successfully connected 20 million students across USA, showing the impact of the signing of the commitment by district education leaders (Madda, 2016).

Neilsen (2013) contends that, research has found out that modern day students use smart phones to learn. The findings indicated that one out of every three middle school students used phones for homework and other classroom activities. Other studies in the USA showed that teachers do agree that the smart phone gives students increased engagement, increased motivation with access to internet as beneficiary to classroom activities (Thomas & O'Bannon, 2014). While teachers acknowledge smart phones as useful learning tools, they manifested a reluctance to embrace them based on their uncertainty as to how to control barriers such as cyberbullying, cheating, disruptions and unwanted sites (Thomas, O'Bannon, & Britt, 2014). On the other hand, teachers' argument on the fact of students being more attached to their cell phones as a source of disruptions and loss of focus, is said to be the best argument for adoption for educational use (AlTameemy, 2017).

In East Africa, a study was conducted in Tanzania and found out that most students in both rural and urban areas had phones but were not allowed to bring them to school (Gibbons, Galloway, Mollel, Mgoma, Pima, & Deogratias, 2018). The study also established that a very small fraction of teachers was positive about bringing cell phones into the curriculum (Gibbons et al., 2018). Phones were banned from the schools and classrooms although students had them, even rural students showed to own smart phones (Gibbons et al., 2018). According to Kafyulilo (2017), the potential for smart phones in Tanzanian schools was not fully realized. The study perceived that the younger and more junior teachers were the majority of those teachers who were positive about having the smart phone in the curriculum while the majority of the older and more experienced teachers were more resistant to the idea.

However, in the same country research found out that smart phones were an invaluable educational tool in refugee camps where student enrolments go up to 150 students per class (Dryden-Peterson, Dahya, & Douhaibi, 2017). These were refugee camps for displaced South Sudanese citizens where educational resources are limited to as low as 1:10 learner- textbook ratio. Studies there showed that mobile phones went a long way in supporting education (Dryden-Peterson et al., 2017).

In West Africa, a study conducted in Ghana to investigate use of technology by students in secondary schools showed that students use technology for communicating with peers rather than for learning (Buaberg-Andon & Issufu, 2015). It was also discovered that use of technology for pedagogy was very low and where it was employed it was by teachers researching for lesson preparation and not for classroom use. Research also found out that integration in schools is stalled by lack of infrastructure, costs and a lack of conscious effort to integrate (Kofi, 2015). According to Ikay (2016), Ghana has a smart phone ban in its public schools and a debate as to whether it should be lifted or not continues to be discussed in the country. Experts in Ghana are arguing that banning phones from schools shows that society sees phones as toys and not as exploration and communication tools (Ikay, 2016).

In Cameroon, Central Africa, the use of cell phones in schools is forbidden (Afusa, 2016). Integration of technology in education is observed as sporadic (Mbangwana, 2013). An ICT policy has been put in place but the use of technology in schools by teachers is said to be used to support traditional teaching. Research cites equipment maintenance and adequacy as major draw-backs in implementation of technology in education in Cameroon. Besides these problems, indicators are that Cameroon like many other African countries is facing the challenge of irregular internet, internet costs and minimum availability of electricity

(Pellissier, 2015).

The DRC Congo is one African country that is viewed as underdeveloped characterized by very expensive and unstable internet (0.3% per 100 inhabitants), very little integration in schools and marked inequality between the urban and rural education (Ngoma, 2010). The same literature indicates that there is a lack of qualified teachers in the schools whose classrooms are too big. In such circumstances, issues of phones in the classroom are not discussed due to the limited availability of the resource to the common people. The country put an ICT policy in 2004, however, literature indicates that DRC is one of the few countries in Africa that is up till now benefit from ICT in its education (Ngoma, 2010).

South Africa has more use of the smart phone in the classroom in higher education than in secondary schools, however, they still find their way into the same classrooms smuggled by students who put them to other uses which are not educational (Walstra, 2013). In another study, it was found out that some schools in South Africa encourage the use of smart phones in recording lessons for later revision, tutoring though a networking company called MXit and accessing e-libraries (Pellisier, 2015). According to the ICEF Monitor (2017), studies in South Africa are showing that 90% of teachers have a negative attitude towards digital technology in the classroom based on the belief that digital technology is creating short span distracted students as opposed to the results of an American survey where 44% of schools have embraced the Bring Your Own Device policy (BYOD) in ICT in the classroom.

The Zimbabwean situation is such that there is a severe ban on smart phones from most public schoolrooms. When the former education minister in the country, Honorable Lazarus Dokora hinted on the integration of phones into the curriculum, there was a cry and hue from both teachers and parents (Herald, 7 Feb. 2015). However, smart phones can help Zimbabwe in the integration of technology with pedagogy which is the narrative of its new curriculum. A recent survey on teacher attitude towards the use of smart phones in the classroom showed that teachers are negative, though they acknowledge that phones can improve learning outcomes as they possess high engagement characteristics, they still did not want them in their classrooms (Dhliwayo & Muchemwa, 2016).

The new curriculum in Zimbabwe has an inclination towards ICT and as such has been hailed as complex for most teachers who are said to be barely computer literate, however the greater challenge is provision of adequate computers in the classrooms for learners (Ndawi, Thomas & Nyaruwata, 2013). According to Konyana and Konyana (2013), the use of computers in the classrooms in Zimbabwe is very low especially in rural areas. In some instances it is due to lack of connectivity and in most rural areas it is lack of electricity and connectivity. Despite availability of computers in urban schools, still learner- computer ratio is very high and connectivity is easier on the smart phone than on desk tops and laptops (UNICEF, 2015).

Research Problem

Zimbabwe is ranked fifth in Africa in terms of population of digital natives amongst its young people (Mingai, 2015). Zimbabwe has a very high literacy rate which renders it by extension internet literate especially among its younger generation, thus fifth in digital nativity. In recognition of that fact, the country has introduced an ICT based curriculum which would see the release of products equipped for the global village. Besides being digital, the country like most in Africa cannot afford adequate computer hardware for its learners across the country to fulfil the demands of its new curriculum. Digital natives entail digital hardware. However, with such learners in possession of smart phones, which are themselves mini-computers, schools and stakeholders continue to ban the smart phone from the classroom.

Research Questions

1. What are the perceived benefits of smart phones in the classroom?
2. What are the reasons for the ban?
3. Are there any measures that can be taken to incorporate smart phones in the classroom?

Research Methodology

The study made use of a research technique referred to as content analysis which is used through interpreting and coding data to make operational inferences. It is a corpus-based research which is descriptive in nature employing a qualitative data treatment with a five step process: (i) related data collection (ii) preparing and organizing data (iii) data is coded (iv) identifying themes / patterns (v) interpretation of data.

Data Collection

The researchers collected smart phone classroom integration data from selected countries, America, countries from East Africa, namely Kenya and Tanzania, West Africa, Central Africa, South Africa and Zimbabwe; dating back to 2010. This was a purposive selection, America for it is a leading economy, and Kenya, Tanzania, West Africa, Central Africa and South Africa are countries from the same continent. Focus was on findings, recommendations and conclusions. The method was suitable to the nature of the study which focused on establishing whether the smart phone can be incorporated in education in the Zimbabwean context. This method had an advantage over a single study as it makes use of the corpus of facts already put together in different studies in different countries.

Data Analysis

Data Thinning

This was the first step. Relevant data was selected on the basis of its bearing on the research questions. After that data was analyzed

Data Coding

The data was looked for common patterns in relation to the research questions in readiness for coding. The research questions were the codes to the units of analysis; perceived benefits of smart phones in the classroom, reasons for their ban and strategies that can be employed to incorporate them in the Zimbabwean classroom. The coding was done through reading through and noting concept occurrences. This was a manual work. In this way, data is analyzed according to the research questions asked.

Identifying Patterns and Themes

On completion of the coding, an attempt to identify themes was then done in relation to each research question asked.

Data Interpretation

Conclusions and recommendations were drawn based on the findings

Emerging Themes

On interpretation of the data, several themes emerged.

Perceived Benefits of Smart Phones in the Classroom.

This study has shown that there are a variety of perceived benefits for allowing learners to bring their phones for learning purposes in the classroom. According to Lenhart, Ling, Campbell, and Purcell (2010) smart phones extend the walls of the classroom as students can continue with the lesson from home. They also contend that lessons are done in real time the real world is brought into the classroom for interaction. While African counties; Kenya, Tanzania, Zimbabwe and part of South Africa still maintain a ban on smart phones from the classroom (Dryden-Peterson et al., 2017; Kafyulilo, 2014; Walstra, 2013; Konyana & Konyana, 2013), the USA has reached a 20 million target on course to avail internet access to students through both computers and the 'Bring Your Own Device' programs (Niesen, 2013; Clark, 2013; Thomas & O'Bannon, 2014).

Perceived Reasons for the Ban

Perceived challenges to allowing the smart phone in the classroom have been found to be numerous and daunting. Stakeholders in Kenya and Tanzania agree that the smart phone can enhance students' performance but are uncertain on issues to do with cheating, disruptions, cyberbullying and opening unsanctioned sites Parents and teachers cited (Gibbons et al., 2017; Kafyulilo, 2014). In some parts of South Africa teachers are said to fear the falling of grades and reduced time-on-task while students are on social media during class time (ICEF Monitor, 2017). In Zimbabwe, both parents and teachers feel legalizing smart phones in the classroom is giving students free passport to go on social media, which may result in the fall in grades in examinations, they are not certain as to how to control cheating, cyber bullying and those undesirable sites (Kottasova, 2015; Mungai, 2015). South Africa also cites teacher inadequacy in ICT training as a major drawback in bringing the phone in the school (ITNews, Africa, 2017)

Strategies to Incorporate Smart Phones in the Classroom

From the countries studied, the USA has a lot to offer in terms of strategies on how Zimbabwe can incorporate the smartphone in the classroom to increase face-to-screen opportunity for ICT in the classroom. The initiation by the USA's former president and the signing of all District Education Superintendents (DES), the pledge of commitment to ICT innovation in education resulted in other initiations like the Bring Your Own Devices (BYOD) policies in schools (Clark, 2013; Higgins, 2014; ICEF Monitor, 2017) Teacher empowerment in the use of ICT through capacity building and improved connectivity through the ConnectED initiative saw teachers gaining confidence in the use of ICT and it translated into readily embracing the BYOD policy in several schools (Clark, 2013).

Conclusions

1. Education departments in the studied countries of East Africa, Western Africa, Central Africa, Southern Africa and America agree that smart phones have the potential to transform education, increase the opportunity to learn and improve students' grades.
2. Education departments in the studied countries of East Africa, Southern Africa, Western Africa, Central Africa and America agree that if not well supervised and integrated, the smart phone has the potential to disrupt learning and lower the achievement graph of learners drastically.
3. Countries studied, Kenya, Tanzania, Ghana, Cameroon, South Africa and Zimbabwe banned the smart phones from their schools for the uncertainty on how to control challenges of cheating, cyberbullying, undesirable sites and social media during learning time.
4. African countries studied shared a common challenge of reliability in internet connectivity, internet costs and electricity challenges especially in their rural areas.
5. All the African countries studied experience a digital divide between rural and urban schools in terms of integration of technology.
6. The USA has shown that if a country sets the stage for commitment to integration of pedagogy with technology, issues of smart phones would naturally be incorporated innovatively with school policies and support.

References

AlTameemy, F. (2017). Mobile phones for teaching and learning implementation and students' and teachers' attitudes. *Journal of Educational Technology Systems, 45*(3), 1 – 13. Available online: http://journals.sagepub.com/doi/abs/10.1177/0047239516659754

Buaberg-Andon, C., & Issufu, V. (2015). Implementation of ICT in learning: a study of students in Ghanaian secondary schools. *Procedia-Social and Behavioral Science, 119*(2), 1282-1287. Retrieved from www.scincedirect.com/science/article/p11/51877042

Clark, D. M. (2013). *Smart phone technology in the classroom*. Retrieved from: http://usat.ly/1cK8h1n/

Department of Education (US). (2014). *ConnectED: Learning powered by technology*. Retrieved from http://www.ed.gov>connected/

Dhliwayo, A., & Muchemwa, S. (2017). An assessment of Zimbabwe secondary school teachers' attitudes towards the use of smart phones in the classroom: A case of Midlands Province. *International Journal of Social Sciences & Educational Studies, 4*(1), 12-25. Retrieved from http://ijsses.org/index.php/volume-4-issue-1-article-2/

Dryden-Peterson, S., Dahya, N., & Douhaibi, D. (2017). How teachers use mobile phones as education tools in refugee camps. *Education and Information Technologies,* 1 – 20. Retrieved from: https://www.brookings.edu/blog/education-plus-development/2017/03/14/how-teachers-use-mobile-phones-as-education-tools-in-refugee-camps/

Freed, R. (2016). *Wired child Reclaiming Childhood in a Digital Age*. Available online: www.richardfreed,com/wired-child/

Gibbons, A. J., Galloway, D., Mollel, A., Mgoma, S., Pima, M., & Deogratias, E. (2018). Mobile phone use in two secondary schools in Tanzania. *Education and Information Technologies, 23*(1), 73-92.

Higgins, J. (2013). *USA TODAY: Views shift on cell*

phones. Retrieved from: https://www.usatoday.com/story/tech/personal/2013/08/07/views-shift-on-cell-phones-in-schools/2607381/

ICEF Monitor. (2017). Retrieved from http://monitor.icef.com/2013/11/integrating-digital-technologies-at-the-k-12-level/

Ikay, O. (2016). *Should the education ministry allow students in schools to use mobile phones in schools in Ghana?* Retrieved from http://www.worthofread.com/adva...

ITNEWS Africa. (2017). *The importance of technology in African schools is vital*. Retrieved from http://www.itnewsafrica.com/2016/03/the-importance-of-technology-in-african-schools-is-vital/

Kafyulilo, A. (2014). Access, use and perceptions of teachers and students towards mobile phones as a tool for teaching and learning in Tanzania. *Education and Information Technologies, 19*(1), 115–127. doi:10.1007/s10639-012-9207-y

Knapton, S. (2016). *Banning smartphones from classrooms could damage education, warn researchers*. Retrieved from: http://www.telegraph.co.uk/science/2016/08/23/banning-smartphones-from-classrooms-could-damage-education-warn/

Kofi, E. N. (2015). *Integration of technology in education*. Retrieved from http:// www.ghanaweb.com

Konyana, S., & Konyana, E. G. (2013). Computerization of rural schools in Zimbabwe: Challenges and opportunities for sustainable development - the case of Chipinge district, South-East Zimbabwe. *African Journal of Teachers, 3*(2), 23-31. https://journal.lib.uoguelph.ca/index.php/ajote/article/view/2156/3119

Kottasova, I. (2015). *Kids do a lot better when schools ban smart phones.* Retrieved from: http://money.cnn.com/2015/05/18/technology/smartphones-schools-ban/

Lenhart, A., Ling, R., Campbell, S., & Purcell, K. (2010). Teens and mobile phones. *Pew Internet and American Life Projects*. Retrieved from http://www.pewinternet.org/2010/04/20/teens-and-mobile-phones/

Madda, M. J. (2016). *Three years of the ConnectED initiative*. Retrieved from: https://www.edsurge.com/news/2016-12-19-looking-back-on-three-years-of-the-connected-initiative-did-it-deliver

Mbangwana, M. (2013). *Introduction of ICT in schools and classrooms in Cameroon*. Ch09-ictand changing mindset.pdf

Mingai, C. (2015). Meet the digital natives trailblazing internet use in Africa. *Mail Guardian Africa*. Retrieved from: http://mgafrica.com/article/2015-02-25-6-facts-about-africas-digital-natives-trailblazing-internet-use-in-the-continent

Ndawi, V. E., Thomas, K. E., & Nyaruwata, T. L. (2013). Barriers to effective integration of information and communication technology in Harare secondary schools. *International Journal of Science and Research (IJSR), 2*(9), 51-64.

Ngoma, S. (2010). *ICT in education: Catalyst for economic growth in the Congo*. Retrieved from http://www.uneca.org/aisi/drc/drc.htm.

Nielsen, L. (2013). Teaching generation text: Using cell phones to enhance learning. *Journal of Digital Learning in Teacher Education, 30*(1). Retrieved from: http://www.techlearning.com/default.aspx?tabid=100&entryid=5393

Office of Instructional Technology. (2014). *Future ready.* United States of America: Department of Education. Retrieved from: https://tech.ed.gov/futureready/

Parsons, D. (2014). The future of mobile learning and implications for education and training. In M. Ally & A. Tsinakos (Eds.). *Increasing learning through mobile learning* (pp. 217–229. Vancouver, BC: Common wealth of Learning and Athabasca University.

Pellissier, H. (2015). Africa is rising! Technology, like cell phones, is aiding Africa's fantastic leap forward. Are the poorest of the poor left behind? Retrieved from: http://brighterbrains.org/articles/entry/we-can-hear-you-now-12-ways-cell-phones-accelerate-africa

The Herald. (2015, 7 February). Retrieved from www.herald.co.zw//

Thomas, K. M., O'Bannon, B. W., & Britt, V. G. (2014). Standing in the schoolhouse door: Teacher perceptions of mobile phones in the classroom. *Journal of Research on Technology in Education, 46*(4). Retrieved from: http://www.tandfonline.com/doi/full/10.1080/15391523.2014.925686?src=recsys

Thomas, K., & O'Bannon, B. (2014). Cell phones in the classroom. *Journal of Digital Learning in Teacher Education, 30*(1) Retrieved from: http://www.tandfonline.com/doi/abs/10.1080/21532974.2013.10784721?src=recsys

UNICEF. (2015). *Children, ICT and development capturing the potential, meeting the challenges*. Retrieved from https://www.unicef-irc.org/publications/pdf/unicef_royalholloway_ict4dreport_final.pdf

Walstra, K. (2013). *Using cell phones in the classroom*. Retrieved from: http://www.karenwalstraconsulting.com/home/index.php?ipkArticleID=37

Wilson-Strydon, M., & Thompson, J. (2011). *Understanding ICT integration in South African classrooms.* Retrieved from http://www.schoolnet.org.za/research/research/Wilson-Strydom_Thomson.doc