A Model for the adoption and effective use of mobile phone for learning in marginalised communities in Zimbabwe.

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Introduction

Mobile phone technology has since developed to become the world's most common way of transmitting voice, data, and services in the developing world particularly Sub-Saharan Africa (Humphreys, 2005; Gomez, Baron and Fiore-Silfvast, 2012; Wulystan and Andrew, 2013). In Zimbabwe, it is the most common technology in the hands of many people across all strata including in the rural areas (Musungwini, 2017, 2018). The SDGs 2016 to 2030 development framework is premised on harnessing ICTs to attain the world we want (Assembly, 2015). SDG goal No4 reads "*Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all*" (Assembly, 2015). Thus, access to ICTs could facilitate easy and less costly access to educational material and learning platform to educators and learners (Munyaradzi Gocha, 2014). This can significantly reduce knowledge and educational imbalances between the marginalized communities and those well-established communities. Currently, ICT adoption for education and learning in Zimbabwe is very low (Munyaradzi Gocha, 2014; Mavellas and Samuel, 2015).

Problem area

Zimbabwe's education for all vision is quite elusive for most rural areas, particularly those newly established fast track resettlement areas. Rural schools are devoid of infrastructure and poorly resourced in teaching and learning material. In some extreme circumstances the girl child is forbidden from using mobile phones. Mobile technology is complex and is entangled in other social developments. The potential to harness mobile phone technology in education is pigeonholed by challenges and opportunities. There is costly ICT price basket index. There exists a gap in the body of scholarly knowledge regarding context specific factors affecting the adoption and utilization of mobile phones in Zimbabwe. There is a dearth of mobile learning adoption models and frameworks grounded in practical research in the context of marginalised communities in developing countries including Zimbabwe. Zimbabwe boasts of a very high mobile phone penetration rate and a high literacy rate. Thus, mobile phones can be harnessed to facilitate teaching and learning in marginalised communities in Zimbabwe. This research investigated contextual factors affecting the adoption of mobile phones for learning purposes and then developed a mobile learning model for the adoption and effective utilisation of mobile phones for educational purposes with special focus on girls in marginalised communities in Sub Saharan Africa based on empirical research data.

OBJECTIVES OF THE STUDY.

The main objective of the study was to develop a model for adoption and effective use of mobile phone adoption for education in marginalised areas in Zimbabwe. In order to accomplish the following sub research objectives guided the study which was to establish:

(1)The mobile learning applications available for Primary and Secondary education in Zimbabwe. (2) The level of mobile phone ownership among teachers and learners in marginalised areas of Zimbabwe. (3) The state of infrastructure like network coverage, electricity and mobile support services in marginalised areas in Zimbabwe. (4) The perceptions of teachers in marginalised schools on the role of mobile phones in teaching and learning process. (5) Identify the key features for the development of the model for adoption and effective use of mobile phone for education in marginalised areas in Zimbabwe.

CONCEPTUAL FRAMEWORK

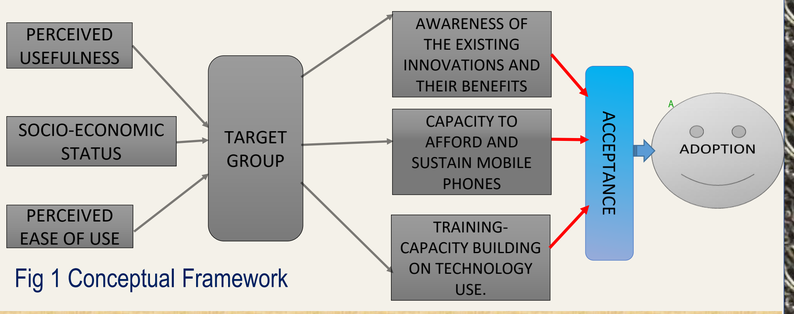

Fig 1 Conceptual Framework

A conceptual framework is defined as a product of fused interconnected concepts (Isaacs, 2010; Heeks and Ospina, 2019). These concepts are usually established from the literature, conversely, a conceptual framework may also be fashioned from views, beliefs and assumptions of the researcher(s) (Miles, Huberman and Saldaña, 2014; Gavai, Musungwini and Mugoniwa, 2018) and it can be presented in graphical form or narrative. It is used in place of the theoretical framework when the research problem cannot meaningfully be researched in reference to only one theory. This conceptual framework is a synthesis of the tenets extracted from other theoretical models and these concepts were regarded as fit for purpose in this research. These tenets are Perceived Usefulness (PU), Perceived ease of use (PEOU) and Socio-Economic Status (SES).

RESEARCH DESIGN

This research is qualitative in nature, it follows case study research design. According to Yin (2009) case study research encompasses the assessment of a single unit in order to establish its key characteristics to be able to draw generalisations from the study. Case study research was deemed valuable in this research because the researcher intended to enquire about the perceptions of educators and learners on the use of mobile phones in teaching and learning in marginalised schools in Shurugwi district. The research data collection instruments used were interviews and focus group discussions. For the focus group discussions, the researcher was the facilitator, and the discussion was recorded on a mobile phone. There are 34 Primary schools and 14 Secondary schools established in all resettlement areas in Shurugwi district. The researcher purposefully sampled 5 schools (3 Secondary and 2 Primary). Interviews were conducted with the Headmaster and 1 teacher of each of the 5 chosen schools to make a total of 10 interviews. The interviewees were labeled as HEAD-A, TEACH-A, HEAD-B, TEACHER-B, HEAD-C, TEACHER-C, HEAD-D, TEACHER-D, HEAD-E and TEACHER-E. A total of two focus group discussions were held, FGD-A with 12 Secondary school students from sampled schools and FGD-B with other teachers selected from the sampled schools.

RESEARCH FINDINGS

The Demographic data for educators.

Variables		Frequencies Respondents	Percentage	Responsibilities Headmaster	Teacher
Gender	Male	12	54.50%	4	8
	Female	10	45.5	1	9
Age	<30	3	13.60%	0	3
	30 to 40	6	27.30%	0	6
	41 to 50	8	36.40%	1	7
	>50	5	22.70%	4	1
Marital Status	Single	2	9%	0	2
	Married	17	77%	4	13
	Widowed	3	13.60%	1	2
Highest Qualification	Diploma	4	18.20%	0	4
	Bachelors degree	15	68.20%	3	12
	Masters degree	3	13.60%	2	1
Teaching Experience	<10 Years	6	27.30%	0	6
	10 to 15 Years	11	50%	1	10
	>15 Years	5	22.70%	4	1
Mobile phone owned	Basic phone	13	59.10%	2	11
	Feature Phone	2	9.10%	0	2
	Smart phone	22	100%	5	17
Network Subscribed.	Econet	22	100%	5	17
	Netone	15	68.20%	5	10
	Telecel	9	40.90%	3	6
Mobile Phone Experi	<10 years	2	9.10%	0	2
	10 to 15 years	13	59.10%	1	12
	>15 years	7	31.80%	4	3
Airtime expenditure	<Z$450.00 **(US$5.00)**	10	45.50%	0	10
	Z$450.00 to Z$730.00 **(US$7.00)**	7	31.80%	0	7
	>Z$730.00 **(US$7.00)**	5	22.70%	5	0

The 12 learners who participated in FGD-A were 6 boys and 6 girls respectively. The age range was between 16 and 18. It was reported that some children walk long distances to school so they may be delayed to start school by their parents. All the 12 learners had no mobile phones. However, they all indicated that their parents had mobile phones at home and they can basically operate mobile phones. The researcher then asked the learners to perform on the chart on fig 2.

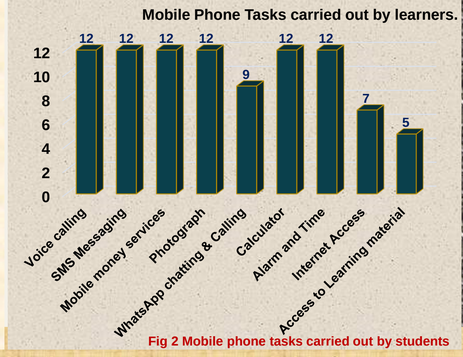

Fig 2 Mobile phone tasks carried out by students

Establish the mobile learning applications and services available for Primary and Secondary education in Zimbabwe.

The research established that there are a number of electronic learning platforms in Zimbabwe that has been developed. There is ZIMSAKE eLearning platform **http://www.zimsake.co.zw**, a resource and practice center for pupils preparing to write ZIMSEC Grade 7, Ordinary level and Advanced level examinations.

Ruzivo Digital Learning is an online interactive elearning platform which targets primary and secondary students in Zimbabwe. Powered by Econet wireless the leading telecommunication organization in Zimbabwe, Ruzivo has been rolled out to rurban schools.

Other electronic learning platforms include Revision.co.zw, Age-X, Mukutronics e-Learning Zone, Dzidzo inhaka, Edupro and Elearning Solutions.

Establish the level of mobile phone ownership among teachers and learners in marginalised areas of Zimbabwe.

The teachers have mobile phones as all the 10 interviewees and those who took part in FGD-B had mobile phones. The teachers were all aware of the electronic learning applications and those teachers with school going children had acquired mobile phone gadgets for them to use for learning purposes. Participants from focus group discussion A indicated that there are few learners from better families like teachers and other very few well to do families who own or have used a mobile phone. Participants from focus group discussion B indicated that as far as they know all teachers had mobile phones except in very extenuating circumstances like broken down, stolen or lost handset, of which it would be for a very short time. However, all those who participated in the FGD-B had smartphones. The following are excerpts from the FGD-B,

- *"The ministry of education should engage the Postal Regulatory Authority of Zimbabwe (POTRAZ) and push for the deployment of base stations in the rural areas. This would ensure the existence of a strong and reliable mobile telecommunication network in rural areas."* ***FGD-B3.***

"The ministry of education should capacitate educators on how to use mobile phones and encourage effective utilisation of mobile phones in teaching and learning. School Headmasters should also be encouraged to use a mobile phone in communicating with teachers, parents and learners. […] Ministry of Education should educate teachers on the role/benefits of ICT in education, it should craft policies which support the development and proliferation of mobile learning platforms, screen the best for use and make it obligatory for schools, educators and learners to use the technologies." ***FGD-B2***

- *"Learners in marginalised communities do not have mobile phones so there is need for a buy in of the parents and guardians of the learners, as they have the mobile phones hence they may allow learners to use the phones for learning purposes."* ***FGD-A7***

"I think mobile telecommunication service companies can provide subsidised data for mobile learning platforms like Econet's Ruzivo and low service package like SMS and Call services for teachers and learners in the rural areas." ***FGD-B1***

	The state of infrastructure like network coverage, electricity and mobile support services in marginalised areas in Zimbabwe.	
1	Poor reception of network signal.	Increase the number of base stations and reduce the number of mobile cells.
2	Absence of signal for other telecommunication operators.	Government should put in place infrastructure sharing policy for telecommunication operators.
3	Absence of electricity infrastructure in some areas.	Government should prioritise schools in its rural electrification drive.
4	Absence of telecommunication infrastructure.	POTRAZ should erect base stations in rural areas that are unprofitable for telecommunication companies. The individual companies can then install their equipment on the erected base stations.
5	Load shading of electricity.	Load shading should be timetabled and done in a way to enable electricity to be useful to teachers and learners.

Establish the perceptions of teachers in marginalised schools on the role of mobile phones in teaching

Number	Role	Explanation.
1	Basic communication gadget.	Voice calling, SMS messages (Chatting, email, App calling)
2	Teaching and learning delivery	Educators can audio record, video record lesson deliveries on their mobile gadgets. They can also prepare lesson using MS Word, MS-Powerpoint, PDF etc. This information can be served on Google drive, drop box etc. Learners can also collaborates on group work assignments.
3	Information Access.	Both educators and learners can use mobile phones to access educational content. But there should be restrictions on what learners can access.
4	Internet delivery.	The mobile phone enables access to the internet for both educators and learners. Access to Web 2.0 facilities (Facebook, Twitter, Instagram, WhatsApp etc) enables students to share material, opinions and views.
5	Content creation and sharing.	The mobile have media that can be used by educators for content creation. The created content can then be shared using mobile sharing facilities like shareit,

RESEARCH FINDINGS

Identify the key features for the development of the model for adoption and effective use of mobile phone for education in marginalised areas in Zimbabwe.

NUMBER	FEATURE	FEATURE COMPONENTS AND EXPLANATION.
1	MOBILE LEARNING ACCEPTANCE.	The ministry of education should carry out awareness campaigns of mLearning innovations that are approved for use. Orient teachers, learners and parents on mLearning use and its importance. Capacity building of educators on mLearning use. Carry out workshops on mLearning use. Ensure mLearning user support. Assure educators about employment continuity.
2	MOBILE LEARNING ADOPTION AND USE.	Provision of telecommunication infrastructure and mobile gadgets facilities and package schemes for educators and learners. Addressing ICT Price Basket index. Economically empower the educators. Provide motivation incentives to both educators and learners.
3	MOBILE LEARNING EFFECTIVE UTILISATION	Evaluate the adoption and use trends. Make adjustments to improve the adoption and utilization. Harmonisation of policies (eg Education and ICT). Monitoring of context specific factors of individual schools lacking behind and provide situation specific remedies like further training.
4	MOBILE LEARNING DIFFUSION.	Mobile learning is now in full throttle, its use in education is now extensive and intensive.

THE PROPOSED MODEL FOR ADOPTION AND USE OF MOBILE PHONE FOR TEACHING AND LEARNING IN MARGINALISED COMMUNITIES.

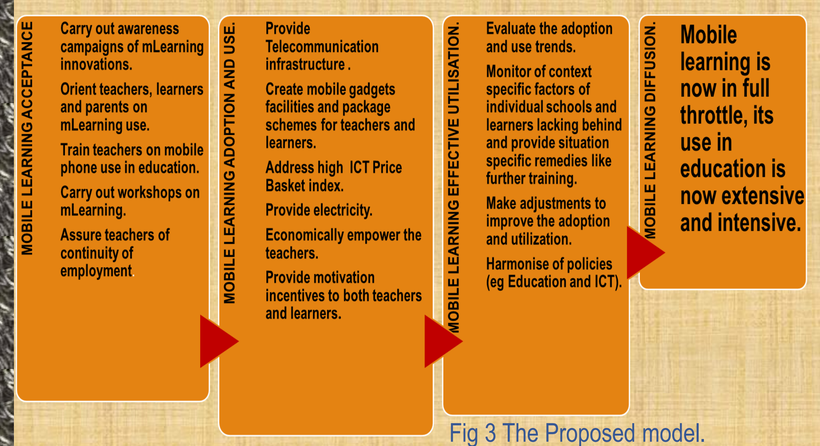

Fig 3 The Proposed model.

CONCLUSION

This research established that there are a very good number of mobile learning applications and services available for use in Zimbabwe and some are free services and it just requires the mobile phones internet access and data. The schools established in rural resettlement areas have very poor infrastructure and they are under-resourced in terms of teaching facilities and equipment. The teachers who participated in the research had mobile phones, all of them had smartphones and some had 2 handsets. Some of these teachers were actually using the mobile phones to assist their own children to access learning material from the internet and mobile learning platforms. The teachers perceive the mobile phone as a very useful gadget in teaching and learning. The mobile phone can be used to perform basic communication activities like Voice calling, SMS messages (Chatting, email, App calling), teaching and learning activities, Information access, Internet delivery and content creation.

However, participants cited poor reception of network signal, absence of signal for other telecommunication operators, absence of electricity infrastructure in some areas, absence of telecommunication infrastructure, load shading of electricity as factors that affect the adoption of mobile phones in teaching and learning in marginalised communities in Zimbabwe. The learners are highly affected by the socio-economic status hence the chances of learners in marginalised communities owning a mobile phone seem to be a far fetched dream. There is need for the government private sector and Non-governmental organisations to be roped in to assist. Mobile phones were also said to be capable of drawing away learners from learning and can be a source of misbehavour by learners. There is need for manufacturing of a educational tailor made mobile phone for learners which should only have learning functions and may not perform any other function.

The research identified 4 components or stages necessary to develop a model for the adoption and utilisation of mobile phones for teaching and learning purposes in marginalised communities in Zimbabwe. The first stage is to attain mobile learning acceptance by all concerned stakeholders. The next stage will be adoption and use of mobile learning. The third stage is to attain effective utilisation of mobile learning. The fourth and final stage will be the diffusion of the mobile learning to all learners and teachers.

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