

Technology as a Key Enabler in Education: Insights from the case of Ruzivo Digital Learning in Zimbabwe

Tolbert Mucheri¹, Kennedy Mubaiwa² and Innocent Takaedza³

Institutions: Higherlife Foundation & Bindura University

Sub Theme: Technology and Education

Education remains a key priority for governments in Africa. In light of the dynamic and ever evolving society of today, the education space has not been stagnant, but rather it continues to undergo innovative changes which seek to enhance educational outcomes effectively and efficiently. The roles of the teacher, student, peers, guardian and authorities in education require continued redefining to improve learning. The United Nations Educational, Scientific and Cultural Organization (UNESCO) takes a holistic and comprehensive approach to promoting ICT in education and further emphasizes that technology is a potential panacea to access, inclusion and quality related challenges in the education sector. The global village in which today's scholars exist calls for improved digital literacy and access to quality learning resources beyond the conventional four wall classroom. The high student teacher ratio, scarcity of textbooks, long distances to school led to the evolution of Ruzivo digital learning which seek to promote access to quality education and enhance inclusion. The Ruzivo digital learning platform has been rolled out in all provinces in Zimbabwe covering primary and secondary content. Main objective of this white paper is to share key learnings based on empirical evidence from Ruzivo Digital learning initiative in Zimbabwe. A mixed methods approach involving quantitative analysis of platform usage statistics and qualitative stakeholder engagements through focus group discussions and key informant interviews informed the findings of this paper. Key findings show that Ruzivo Digital learning is a useful learning platform for the learner and teacher and has reached north of 600,000 registrations and 160,000 active users since inception in 2016. It is rated as most popular on the market and is bridging the gap in terms of access to educational content though there is critical need to boost ICT skills amongst educators. The paper concludes by pitching provoking policy insights relevant for continued technology driven development of the education space in tandem with the regional and global level trends.

Key Words

Education, Technology, Ruzivo Digital Learning

¹ Dr Tolbert Mucheri is a Senior Manager, Research Policy & Advocacy with Higherlife Foundation

² Dr Kennedy Mubaiwa is Director Education at Higherlife Foundation

³ Innocent Takaedza is Monitoring & Evaluation Senior Associate and MPhil Student, Stellenbosch university, SA

1.0.Introduction

Haggard (2015) argues that through the United Nations Millenium Development Goals efforts have been made to ensure universal primary education is achieved. To this end Sub-Saharan Africa is reported to have had the best record of improvement in primary education compared to any region since the MDGs were established. The region achieved a 20 percentage point increase in the net enrolment rate from 2000 to 2015, compared to a gain of 8 percentage points between 1990 and 2000 (United Nations, 2015). However the efforts on access seem to have missed on quality objectives as argued by Haggard (2015) that low achievement by pupils is a now a growing concern further arguing that “the next target for governments, businesses and donors up to 2030, then, is to address the all-too common scenario in Africa of overcrowded classes, absent or unqualified teachers, poor or nonexistent materials, and curricula based around rote learning rather than understanding”. Yet in practice quality education is vaguely defined (Ng, 2015). In both theory and practice conceptions of quality education is influenced by whether one is coming from the perspective of educational processes or educational outcomes. The later, usually interprets quality “as conformance to some pre-set quantifiable indicators or standards” (Ng, 2015) while on the other hand UNESCO who are among the proponents of quality of education as seen from the perspective of educational processes argue that quality education can be understood to be based upon four pillars(Ng, 2015):

- Learning to know: acknowledges that learners build their own knowledge daily, combining indigenous and ‘external’ elements
- Learning to do: focuses on the practical application of what is learned
- Learning to live together: addresses the critical skills for a life free from discrimination, where all have equal opportunity to develop themselves, their families and their communities
- Learning to be: emphasizes the skills needed for individuals to develop their full potential.

UNICEF (2000) add environments that are healthy, safe, protective and gender-sensitive, and provide adequate resources and facilities and Outcomes that encompass knowledge, skills and attitudes, and are linked to national goals for education and positive participation in society among others to the attributes of quality education.

Different governments and organizations have adopted varied approaches all meant to improve the quality of education. Information Communication Technology (ICTs) is among the many approaches and seem to have gained a lot of attention and traction in the quality of education discourse. There are many avenues by which this new focus on quality might be pursued, but one possibility garnering a lot of attention sees a strong role for ICTs (UNICEF, 2000).

Higherlife Foundation’s quality education thrust focuses on ensuring adequate learning materials to improve learning outcomes through acquisition of knowledge and skills. This is done through an ICT based solution, Ruzivo Digital learning that delivers curricula via the internet. This paper presents the key lessons learnt and empirical findings in implementing Ruzivo Digital Learning platform that aims to enhance the quality of education in Zimbabwe by aggregating content for

all taught primary and secondary levels and also explores the education and technology landscape in Zimbabwe to give the relevant conceptual background.

1.1. Background Technology and Education Zimbabwe

By 2012 "about 45 African countries had adopted ICT policies in recognition of its potential as a driver for socio-economic transformation, especially in the education sector" (MLA, 2012) with the general belief that ICT has the potential to address the falling years of schooling, high rates of drop-outs, increasing class sizes and poor school conditions. This is coming at the backdrop of increased trends in digital classrooms, cloud computing, MOOCs, social media, one-to-one computing and mobile learning. Technology also creates opportunities for using the Internet for learning without the constraint of geography, disability, gender and other social and economic barriers.

Internet is a key enabler for the integration of technology into education especially when offline versions on e-learning platforms are still limited. Data released by the ITU shows that about 27% of Africa's 1.2 billion people are connected on the internet. Zimbabwe's internet penetration rate is much higher than the continental average at 46.5% by 2016 as shown in the table below.

Table 1: Internet Usage and Population Growth

YEAR	Users	Population	% Pen.	Usage Source
2000	50,000	14,712,000	0.3 %	ITU
2002	500,000	13,874,610	3.6 %	ITU
2005	820,000	12,247,589	6.7 %	ITU
2008	1,351,000	12,382,920	10.9 %	ITU
2011	1,445,717	12,619,600	11.5 %	ITU
2016	6,759,032	14,546,961	46.5 %	ITU

Source: <http://www.internetworldstats.com/af/zw.htm>

2.0. Methodology

This empirical paper combined both quantitative and qualitative approaches in data collection and analysis in order to leverage the strengths of mixed methods research design. Secondary sources of data were reviewed to give contextual background. The following related researches were conducted sequentially in producing this paper;

Brand Health check and Customer satisfaction survey

An independent research was conducted on the Ruzivo Brand health in order to collect data on related products on the market and levels of awareness and uptake. Main objectives of the Ruzivo Brand Health check and customer satisfaction survey were to;

- i. Measure Customer Experience – Customers were stratified according to teachers, school authorities and pupils
- ii. Measure existing customer satisfaction with the Ruzivo Platform- to find out specifically if the users of Ruzivo were comfortable with recommending others to use the platform, their continued use of Ruzivo in future.
- iii. Measure Ruzivo Brand Awareness – level of awareness of Ruzivo platform and how it compares with other brands in the market basing on
 - Top of the Mind Awareness
 - Brand Usage & Market share
 - Advertising Awareness

A total 1309 interviews were conducted covering all 10 provinces in Zimbabwe. In total 88 primary schools were reached, 64 were using Ruzivo platform and 24 not using Ruzivo. Random sampling was done using lists of schools provided at provincial level.

In built Ruzivo back end analytics of usage and registration data was the major source of real time statistical data on the Ruzivo platform. A number field focus group discussions, direct observations and key informants interviews were all harnessed to gather robust data for this paper.

ICT Educator Training Assessment

Roll out of Ruzivo digital learning rely critically on the ICT competencies of educators hence need to up skill in practice teachers in tandem with government priorities. A needs assessment was done during pilot phase and teacher training programme was rolled out. The assessment took place four months from the initial training hence ICT trained teachers became the sampling frame and the first batch of teachers trained in April 2017 formed the population (502). A sample of 218 teachers was deemed representative at 99% confidence level and 5% margin of error. However a total of 326 teachers were interviewed, a large sample size is more representative of the population, limiting the influence of outliers or extreme observations.

The assessment used a structured and mostly closed questionnaire to collect data via telephone interviews (80%) and 20% face to face interviews. A team comprising Associates and Interns in the Research Policy and Advocacy department carried out the assessment after having gone through a training on data collection.

Focus Group Discussion with Scholars

A total of 324 secondary school scholars in purposively selected schools were engaged through Focus Group Discussions to find out level of awareness and utilization for the Ruzivo digital learning platform. Most highlighted feedback was usefulness of Ruzivo as a compliment to conventional learning and a source for notes, exercises and tests to improve learning. However limited connectivity was main challenge as 75% of participants pointed to the slow loading speed of Ruzivo pages and inadequate gadgets. Average time per session was 35 minutes mainly involving taking notes and content reading which make a case to redefine usage of Ruzivo platform to encompass time on the platform as opposed to current definition limited on attempting an exercise.

Ruzivo Smart Learning Conceptual framework



3.0. Positioning Ruzivo Digital Learning in the education space in Zimbabwe

As more and more people in Zimbabwe are getting connected Higherlife Foundation took the opportunity to create internet based solutions to contribute to the attainment of quality education in Zimbabwean primary and secondary schools. Ruzivo Smart Learning addresses the challenge of unavailability of text books and also creates an opportunity for pupils to self-teach. There are about 8500 primary and secondary schools in Zimbabwe, 45% of the schools (3823) have access to Ruzivo Smart Learning and over 165 000 students have used the platform to access high quality content aligned to the national curriculum.

Province	Number of Students	
	Using the Platform	Tablets Distributed
Mashonaland West	15445	414
Manicaland	19911	490
Harare	21309	478
Masvingo	19657	503
Midlands	28412	297
Mashonaland Central	14425	379
Matabeleland North	10890	370
Bulawayo	15044	354
Matabeleland South	10092	355
Mashonaland East	11184	230
Total	166369	3870

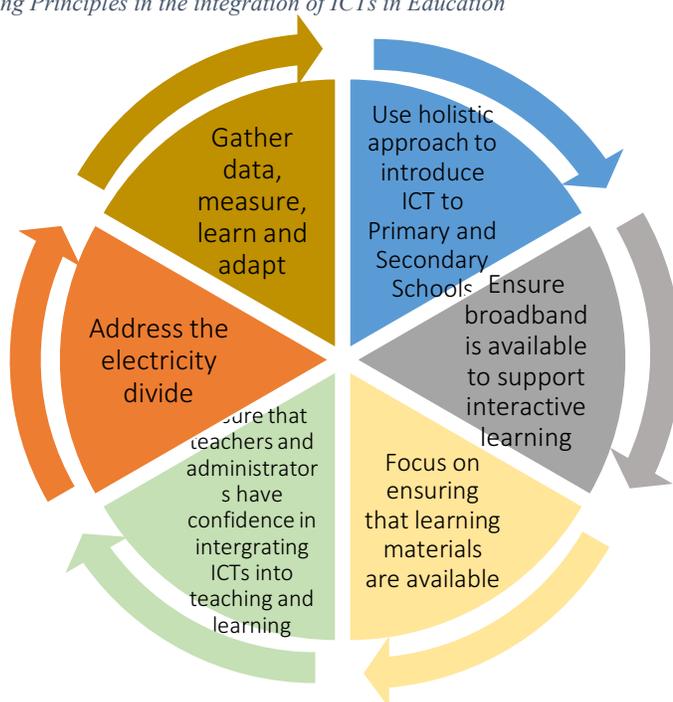
Figure 1 represents the guiding principles in the integration of Ruzivo Smart Learning in the Zimbabwean basic education system. A holistic approach was adopted to ensure that content for all levels is accessible for both primary and secondary. The content is constantly reviewed to ensure its responsiveness and relevance. One of the challenges particularly in underserved communities is the unavailability of broadband services. In partnership with its strategic partners Higherlife Foundation has managed to install high speed internet infrastructure in 171 schools.

One of the key principles that is meant to foster sustainability of the initiative is the capacitation of teachers and education administrators. This is critical in ensuring implementation of policies meant to integrate ICTs in education and also to make the teacher comfortable in adopting blended teaching. Chappuis and Stiggins (2008) argue that teachers need quality information from high-quality assessments to make appropriate decisions regarding what to teach, how to teach, and how to evaluate student achievement. Cognizant of this fact Higherlife Foundation has trained 6332 teachers, 56% of whom are women as shown in table 2.

Province	Trained			
	Male	Female	Total	
Harare		95	334	429
Manicaland		231	334	565
Mash Central		250	282	532
Mash East		61	110	171
Mash West		282	672	954
Bulawayo		91	412	503
Masvingo		432	641	1073
Mat North		460	582	1042
Mat South		297	526	823
Midlands		68	172	240
Total		2267	4065	6332

Unavailability of electricity remains a major challenge accentuating the urban-rural divide when it comes to integrating ICTs in education. Other scholars posit that, ICT-based learning cannot succeed without other ingredients including electricity. The Internet works well where and when the barriers of connectivity, cost, access, use, and electricity are dealt with head on. These barriers cannot be met without the commitments and actions of policy makers, educators and other stakeholders. However, guided by its Guiding principles as a stop gap measure Higherlife has distributed 3870 tablets mostly to schools without electricity to enable students in these schools to access Ruzivo Smart Learning platform. The tablets are recharged using solar power.

Figure 1: Guiding Principles in the integration of ICTs in Education



Adapted from Internet Society 2017

Findings from internal assessments

An internal assessment carried out on teachers who were trained on ICTs showed that 86% of them reported that their students access and use Ruzivo in the designated computer labs at their schools. The assessment asked trained teacher the number of days their children use Ruzivo in a week and how much time in hours each session lasts. On average according to the interviewed teachers students access Ruzivo Smart Learning about 1.3 days per week with each session lasting slightly above 50 minutes, this translates to about one hour thirteen minutes of study/learning using Ruzivo Smart learning per week. Further analysis shows that those trained teachers reported that children who access Ruzivo from their classes as well as from the computer lab have an additional 5 minutes per week over and above those who only access Ruzivo from the computer lab.

Table 2: Access to Ruzivo by Province

Province	#days access to Ruzivo	#hours per session
Harare	1.0800	0.660
Manicaland	1.3571	0.924
Mash Central	1.3636	0.867
Mash East	1.1429	0.857
Mash West	1.3911	0.766
Masvingo	1.4333	0.777
Mat North	1.0833	0.875
Mat South	1.0000	0.750
Midlands	1.2340	0.755
Total	1.2796	0.819

About 10% of the teachers reported that their students access internet from their classrooms, such students have been observed to benefit more as this allows more integration with teachers able to decide and plan which Ruzivo content to deliver and how.

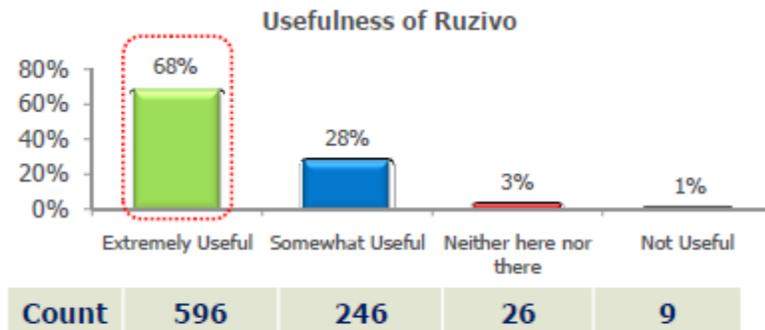
Integration of technology into education may not work very well if seen from a negative perspective by users, attitudes towards technological advancements in education are shaped by perceived utility or lack thereof. This assessment explored teacher perceptions on technology as a tool to enhance the quality of education. Survey participants were asked to agree or disagree to statements on whether technology has a positive impact on students' concentration, try harder, feel

more independent, understand more easily or remember more easily when using technology among other aspects. Majority of the teachers have positive perception of about the integration of technology into education as shown on the table below 71% strong agree that students concentrate more on their learning if it is done through use of ICT, encourages students to work harder (61%), creates an enabling environment for independence (67%), encourages collaboration and cooperation among students (58%), motivates (69%), encourages students to achieve better grades (61%) and lastly stimulates critical thinking, analysis and problem solving (59%). These perceptions result in positive attitude towards the integration of ICT in education.

Table 3: Teacher Perception on Technology and Education

	Strongly Agree	Agree	Disagree	Strongly Disagree
<i>Students concentrate more on their learning</i>	71.8%	27.3%	0.6%	0.3%
<i>Students try harder in what they are learning</i>	60.9%	36.5%	2.3%	0.3%
<i>Students feel more independent in their learning</i>	67.4%	27.4%	4.9%	0.3%
<i>Students understand more easily what they learn</i>	60.1%	34.6%	4.9%	0.3%
<i>Students remember more easily what they would have learnt</i>	69.7%	26.7%	2.9%	0.7%
<i>ICT fosters collaboration between students</i>	58.0%	37.7%	2.6%	1.6%
<i>ICT positively impacts students motivation</i>	69.0%	29.4%	1.0%	0.0%
<i>ICT positively impacts students' Achievement</i>	61.2%	37.5%	1.0%	0.3%
<i>ICT positively impacts critical thinking analysis & problem solving</i>	59.4%	36.7%	3.2%	0.6%

Users of the Ruzivo platform have similar perceptions with 68% of the students indicating that the platform is extremely useful, only 1% found the platform not be useful. Majority of the students who found Ruzivo platform to be useful use the platform for revision, gaining new knowledge, and also the fact that it is interactive and easy to navigate. All these attributes, particularly interactivity enhances learning and knowledge retention among students. Ibrahim and Al-Shara (2007) observed that the one way communication method of lecturing with limited or opportunity for feedback from students and audiences in general has a major impact on their attention span and retention level.



Current Users of Ruzivo Platform, N = 877

Source: Project Smart, Ruzivo Digital Learning Platform Research, April 2017

This innovative platform has not been fully evaluated yet but results from preliminary assessments with users indicate high acceptability suggesting that it resonates with user expectations. Figure 2 below shows that majority of the users are highly satisfied with the performance of the platform and therefore it is likely to achieve its objective of improving learning outcomes.



Total = 877, Private Users/Individuals = 300, Pupils = 419, School Authorities = 53, Teacher = 105

Source: Project Smart, Ruzivo Digital Learning Platform Research, April 2017

4.0. Conclusion and recommendations

Higherlife Foundation’s experience shows that integration of ICT in education is gaining traction at policy level and has high acceptability at user level. This is a positive that must be capitalized to ensure that education is transformed in a positive way.

This transformation requires that the government, private sector players and civil society organizations put their concerted efforts in ensuring that appropriate infrastructure exists across the country especially in hard to reach geographies to ensure inclusive growth.

Data also shows that investments in internet infrastructure must be matched with investments in staff development who are the key drivers in technology adoption. Most interventions have centered on the learner but findings in this paper posit that investing in educator up skilling will have a multiplier effect and scale up impact on learner performance.

References

- i. Haggard, S. (2015) *African education 2.0*, IC Publications, Inc, London.
- ii. MLA 8th Edition "MINISTERS DISCUSS SUSTAINABLE FINANCING OF ICT IN EDUCATION IN AFRICA." *States News Service*, 28 May 2012. *Academic OneFile*, go.galegroup.com/ps/i.do?p=AONE&sw=w&u=27uos&v=2.1&id=GALE%7CA291320682&it=r&asid=52c0206894dadc29aa6a3709b9fd6496. Accessed 24 Aug. 2017.
- iii. Ibrahim, M. and Al-Shara, O. (2007) Impact of Interactive Learning on Knowledge Retention. *Human Interface and Management of Information. Interacting with Information Environment* pp 347 – 355
- iv. Adams, D. (1993) 'Defining quality in education', *Improving Educational Quality Project*, Biennial R(1), p. 14.
- v. Ng, P. T. (2015) 'What is quality education? How can it be achieved? The perspectives of school middle leaders in Singapore', *Educational Assessment, Evaluation and Accountability*, 27(4), pp. 307–322. doi: 10.1007/s11092-015-9223-8.
- vi. United Nations (2015) 'The Millennium Development Goals Report 2015 Summary', *MDG Report*, pp. 55–58. doi: accessed 26 July 2015.