TECHNOLOGY INTEGRATION BEST PRACTICES FOR OUT-OF-SCHOOL TIME LEARNING

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Abstract: *This paper established the best practices for effective technology integration for out-of-school time learning. The study adopted a multiple case study design where three participants from Ubongo Kids Ltd and Tanzania Broadcasting Corporation (TBC) were interviewed. The inductive approach was used to analyse the qualitative data. To complement the lessons learned from these two OST educational technology disseminators; documentary review was done for a third institution, which is XPRIZE Project of 2017. The study revealed the needs assessment, designing the technology content, technology dissemination, championship strategy, involvement of stakeholders, partnership strategies, and evaluation as best practices for effective technology integration for OST learning where the participation of key stakeholders was concluded as principal practice. Thus, the school administrators are argued to initiate partnership strategies with the community for the purpose of addressing the prevailing challenges and venturing into the existing opportunities to foster the best practices I with respect to the use of educational technology in OST learning. Further studies are encouraged to investigate the applicability of the proposed practices for OST technology integration in other settings such as secondary schools, rural or town per se, in-school, and in countries outside Tanzania.*

Key Words: *Technology integration, Out-of-school time, Best practices, Technology design.*

1. INTRODUCTION:

In the context of formal education, Technology integration is the application of technology in education delivery. Technology integration thus assumes that technology offers a lot of learning potentials that can be exploited differently by educational managers including regular classroom teachers and school management. The purpose is to offer learners an opportunity to make use of technology content, technology tools and best practices for improved learning outcomes.[1,2] The term 'best practice' was originally adopted by practitioners in such fields as medicine, architecture; and it simply described reputable performance of activities in the fields.[3]

Despite the fact that technology integration can be applied best in regular classrooms, it can also be used successfully in out of school time learning since learners especially day scholars spend a significant portion of their time out of school. The Indianapolis Afterschool Coalition[4] perceives Out-of-School Time (OST) learning as the engagement of learners in school related tasks outside the school normal schedules, including before school, after school, during vacations and weekends. This fact has won the support of various scholars and educational institutions. The modern world requires efficient integration of technology in teaching and learning to ensure optimum fostering of learners' learning potentials.[5] Moreover, The World Summit on the Information Society (WSIS)[6] calls for the need of world nations to integrate the Information Communication Technology (ICT) into their educational practices. Empirically, integration of technology in OST learning has been successfully recorded in various parts of the world through diverse approaches. For example, the community centres have conventionally been characterized by use of OST learning in the United States of America.[7,8] Similarly, private tutoring centres have been regarded as an avenue for students to make the best use of their out of school time in Taiwan, Mauritius, India, Egypt, Tanzania and Kenya.[9,10]

The Government of Tanzania has shown commitment in the integration of educational technology into its educational system as manifested in the Tanzania Vision 202, in the National ICT Policy of 2016, and in the ICT Policy for Basic Education.[11-13] The Tanzania Vision 2025, for instance, capitalizes on the need for the national education system to adopt ICT from the lowest levels in a bid to instil a technology culture in the whole population.

Despite of the commitment of the Tanzanian Government to integrate educational technology in education, it has been noted that the actual integration of technology in the education system chiefly in the context of OST is inadequate.[12-15]

This inadequacy is partly attributed to the observation that although technologists have been able to develop advanced technologies applicable in various disciplines, they have not vested equal efforts to invent a model that would stipulate the best practices towards the applicability of such technologies in the context of OST learning.[16,17] This article draws experiences from OST learning technology providers to propose the best practices for primary school learners to exploit educational technology in OST learning in Tanzania. This work is based on a thesis submitted by the Author of this paper for the award of a doctoral degree of the University of Dodoma.[18] The Thesis developed a model to hasten technology integration for out-of-school time primary school learning.

2. LITERATURE REVIEW :
Out of school time learning has been practised in different countries of the world, and this section reviews a handful of cases but in different forms and local contexts.

2.1 Out of school time centres in Taiwan
The use of OST programmes in Taiwan was motivated by industrial revolution which rendered parents too busy to secure enough time to take care of their children after school time.[19] OST programmes in Taiwan have won recognition of the country; and they are indeed managed the Government Ministry of education as a relevant body of the government.[20] Apart from offering an avenue for child care and ensuring parents safety of their children, OST centres have significantly benefited less privileged children.[19]

2.2 Nakaseke multipurpose community tele-centre and library in Uganda
The Nakaseke Multipurpose Community Tele-centre and Library was established purposefully to provide ICTs and library services in Nakaseke, which is typically a rural area.[21] Among the recent developments is the establishment of Nakaseke Community Radio.[22] Since its inception in 2003, the Radio has been a useful forum and knowledge portal for the poor rural population in the area. For example, the Radio Quiz Competition programme benefits 95 primary schools which cater for over 13,401 pupils. The programme is a joint venture between teachers and the local community. The task of teachers is to set and broadcast questions to which learners have to give answers, and then teachers give feedback in terms of elaboration and corrections. In order to ensure that learners are optimally motivated, winners are given prizes which are obtained through donation stakeholders mostly parents, local leaders, members of parliament and Non-Government Organizations (NGOs). Some of the benefits which are said to have accrued from the programme include cultivating confidence in learners, improvement of academic achievements, bringing local school teachers together and promotion of competition among OST learners. Learners have also been made more aware of essential academic issues, while their learning opportunities at home have been extended.[22]

2.3 Private tutoring
It has been noted that in Kenya that 68.6% of primary school pupils rely on private tutoring.[10] In Tanzania, private tutoring has been recorded for primary and secondary schools. However, Mbelle and Katabaro[23] report that the Ministry of Education has officially banned this initiative. The grounds for banning private tutoring centres in Tanzania have been given by Astridah[24] and include involvement of untrained teachers who simply chip in for economic gains, while also some learners see private tutoring as an opportunity to engage in unethical behaviours including sex. Moreover, some learners fail to develop necessary analytical skills since teachers tend to do almost everything for them such that learners become passive. Given the advantages associated with OST learning, this article seeks to explore an alternative mode which takes care of the shortcomings observed in the Tanzanian OST practices.

2.4 Best practices development modalities
Literature review shows that there have been various modalities to establishing best practices. These include the explanatory study, and best practice research. Explanatory and best practice research reveals diverse approaches to instituting best practices.

The explanatory research method supports the idea of exploring the contexts from which the problem emerges. From explanatory point of view, it is imperative to consider the local contexts in order to realize the best outcomes.[25] Thus, exploratory research helps bring to light a problem that is not clearly known with a view to clearly defining the pertinent variables and establishing their interrelatedness in connection with the phenomenon under consideration. The explanatory approach also entails the examination of the respective environment using a variety of techniques, subsuming consultation of the existing literature, practicing professionals, case studies as well as pilot studies.[25] However, the usefulness of explanatory research suffers one limitation; it is silent on the fundamental steps necessary

for discovery of the unknown variables; and this weakness is taken care of through the application of the best practice approach.

Eglene[26] observes that the best practice research assumes that issues related to a particular group, regardless of their uniqueness, are likely to have been experienced and managed elsewhere. Therefore, best and current practices research is intended to guide organizations to draw experiences from other institutions regarding the way they manage situations. Best practice research is thus a systematic attempt to learn from similar experience in other contexts by locating and assessing the solutions adopted by the other organizations in a bid to gain an insight on the most practicable solution. In view of this, if an organization buys ideas from the best practice research approach, it subsequently agrees that there are similar agencies out there which have ever experienced similar problems and thus they have the best explanation of the problems and the best solution as well. One of the fundamental steps for best practice research is an in-depth investigation in selected entities that have ever implemented the practice.[26] Best practice research is also credited for its affordability as it can be carried out even with limited time and financial resources.

3. METHODOLOGY:

A multiple case study was adopted whereby two organizations in Tanzania were involved; and interviews were used to collect qualitative data. Participants were purposefully drawn from Ubongo Kids Ltd and Tanzania Broadcasting Corporation (TBC). The selection criteria included coverage of most of the Tanzanian regions; long period of broadcasting and operation as well as focus on primary school-related programmes.

A list of broadcasting companies was obtained from the Tanzania Communication Regulatory Authority (TCRA); and the analysis showed that the TBC met all the set criteria. Then, two senior employees in the department concerned educational programmes for primary schools were selected to take interviews.

The analysis of the companies also showed that Ubongo Kids Ltd owns and runs Ubongo Kids programme, with a focus on Mathematics for lower primary school grades. This is among educational programmes aired by TBC. Ubongo Kids also qualified in terms of wide coverage in the country, making it yet another popular OST educational technology provider for examination. Convenient sampling was then employed to obtain one senior officer at Ubongo Kids who was involved in designing and operating the related educational technology. The employee was then interviewed to gain insights on their practices in relation to OST learning technology. The lessons obtained from TBC and Ubongo Kids Ltd were complemented by documentary review which involved XPRIZE Project of 2017. The XPRIZE Project had significant contribution in educational technologies for primary school learners and, therefore, its documentary review was used to complement the findings from TBC and Ubongo Kids.

4. FINDINGS :

The findings gained from the practices of OST educational technology providers in Tanzania revealed the avenues and limitations associated with the use of technology. There were two OST educational technology disseminators, namely Ubongo Kids and Tanzania Broadcasting Corporation (TBC). The researcher directly investigated the disseminators, and the primary data were used to discover the respective lessons. To supplement the lessons learned from these two OST educational technology disseminators, documentary review was done for a third institution, which is XPRIZE Project of 2017. The three entities dealt with OST technology dissemination with a focus on primary schools.

The respondents from Ubongo Kids and TBC each were interviewed with a view to exploring their practices in respect of technology integration. Both respondents explained the strategies they used in designing and disseminating their respective programmes. The results of their responses and the insights gained from the XPRIZE project were inductively organized into respective themes as presented in the subsequent subsections.

4.1 Needs assessment

The findings reveal that needs assessment was an important and common practice in the two studied OST learning offering institutions. The Ubongo Kids respondent explained that they use the prototype of the intended technology to design the target technology. The assessment involved various stakeholders, particularly prospective learners and teachers. For instance, children are involved as potential users of the technology to make their choices in the order of preference. This exercise involved both oral and written examinations. Similarly, teachers were invited to give their views and perceptions about the design of the educational technology to be developed. Eventually, the most preferred technology design is adopted paving way for development of the intended educational technology for OST learning.

The mode of assessment practised by TBC is relatively different from what is done by Ubongo Kids Ltd in that the former relies entirely on the content of the curriculum adopted by the National Examinations Council (NECTA). This is ascertained by, the TBC respondent who said that they determine the needs of the prospective programme beneficiaries by referring to the primary school NECTA curriculum. What appears to be common in the two organizations is the consideration of the local environment. Both Ubongo Kids and TBC informants said that the nature of the design of their programmes drawn substantially from the local environment pertaining to primary schools in Tanzania. Among the indicators of consideration of the local context is the use of Kiswahili language in which most Tanzanians are conversant. However, documentary review of XPRIZE practices did not show any explicit manifestation of needs analysis, implying that they take it for granted that what they include in their programmes corresponds to the local needs and learning context in primary schools.

4.2 Designing the technology content

It was also found that the two OST learning service providers employed different approaches to designing the technology content especially with regard to the involvement of key stakeholders. In particular, the Ubongo Kids respondent narrated that the technology content was designed collectively teachers, artists and experts in technology. As for TBC, the technology content design involved only internal experts and professionals trained in children's programmes. Again the review of XPRIZE project does not show explicit initiatives adopted in designing the technology content. There were efforts, however, to upload the preferred technology content to tablets which would then be availed to prospective learners. This partly implies that there are efforts to ensure that technology content is strategically selected.

4.3 Technology dissemination

Dissemination of the developed technology is an important stage towards its use, and the studied organizations had different approaches to disseminating their technology content. Whereas the Ubongo Kids mainly uses DVDs and television broadcasting, TBC prefers live and recorded broadcasting and the XPRIZE presents its technology content using tablets, which are then donated and given freely to needy children, along with solar systems and other related infrastructure. Moreover, the implementation of XPRIZE programme is overseen by field supervisors. Comparatively, it may look that the XPRIZE is associated with more costs especially as regards technology dissemination as compared to the situation in the other two organizations. And indeed, XPRIZE currently covers only two districts in Tanga Region, probably because of the costs attached therein. This is far different from Ubongo Kids and TBC who enjoy a wider catchment area in terms of television coverage.

4.4 Championship strategy

The Ubongo Kids respondent explained that the project was run by a team of teachers and artists, and these are the very initiators of the project. The situation was, however, quite different in the case of TBC as the role of teachers was not found to be explicitly noted. Instead, the TBC relied on internal professionals headed by the in-charges of relevant sections to operate and manage children's programmes. As for the XPRIZE project, a field supervisor was consulted for technical assistance to see that the programme was smoothly run.

4.5 Involvement of stakeholders

During broadcasting, the TBC normally reach out-of-scene children through digital communication to participate in the programme. Moreover, the presenters may invite some experts, administrators or government officials to take part in live broadcasting of programmes. As for the case of Ubongo Kids, involvement of stakeholders extended also to prospective beneficiaries of the programme particularly school children and teachers in the form of needs assessment. The situation was almost similar in the case of the XPRIZE since they also consider the significance of community members who participate in the project implementation. Therefore, in all the three studied projects, efforts are made to involve the prospective beneficiaries and other stakeholders in the community, though in varying degrees.

4.6 Partnership strategies

Findings also discovered some efforts directed towards obtaining and maintaining partnership with key stakeholders especially in implementing the projects. A TBC respondent revealed that they had partnership with the Plan International who usually supports children programmes financially. Partnership was also noted in Ubongo Kids project which disseminates the technology content the TBC and financed by the United Nations. On the other hand, UNESCO and the World Food Programme (WFP) support the XPRIZE project in collaboration with the MoEST, and the President's Office Regional Administration and Local Government (PO-RALG). In this partnership, the WFP supplies tablets, uploads software to the tablets, installs solar power to the village centres, maintains and replaces the tablets. Conversely, UNESCO manages the educational component in close partnership with the MoEST and the PO-RALG. It should be

noted, however, that the partnership seen in this venture is intended to smoothen the development and delivery of the technology content such that the actual use of the technology constitutes a different consideration.

4.7 Evaluation

Technology, including educational technology is subject to change over time, especially in the current ever changing world. This requires constant monitoring of the suitability of technology. It was found that the Ubongo Kids periodically carries out evaluation to ensure effectiveness of their programmes. Normally, evaluation involves used control and experimental groups; such that the experimental group is given the opportunity to use the educational technology while the control group is spared. Eventually, the two groups are examined using the same tool. According to the respondent, the performance of the experimental group has been consistently better and statistically significant than the performance of the control group.

As for the TBC, the determination of acceptance of their programmes involves the continuous feedback from the community as the key stakeholders. The respondent stated that the comments they receive from the community are in most cases positive; and that is indication of acceptance of their programmes and that the community is always eager to co-operate even upon broadcasting request. As for the XPRIZE, the evaluation of the project relies on the performance of the targeted learners in arithmetic skills, writing and reading.

5. DISCUSSION:

It has been evident from the findings that involvement of stakeholders is among the key consideration for successful technology integration especially in the context of OST learning. This view has also been found to be important in different contexts of technology integration in general. The Burkman's theory of a user-oriented instructional development (UOID), for instance, insisted the need for involvement of key stakeholders including the community and end users. The theory specifically advances that views, needs and perceptions of the adopters as they are fundamental drivers that determine successful adoption of technologies.[27] This implies partly that technological innovation does not necessarily translate into its application unless the end users are motivated to adopt the resultant product. Burkman[28] puts it clearly that instructional models should be more user-oriented if technological products are to be successfully adopted.

In this article, all the three OST learning service providers solicit and incorporate stakeholders' views in the course of developing and integrating the educational technology. The advantage of solicitation and integration of the key stakeholders' perceptions is that it instils the sense of ownership of the technology and eases its adaptability by the target practice, thereby ensuring effectiveness in OST technology integration.

6. CONCLUSION AND RECOMMEDATIONS:

In this article, the best practices for effective technology integration in OST learning have been established;. The needs assessment, designing the technology content, technology dissemination, championship strategy, involvement of stakeholders, partnership strategies, and evaluation were established as best technology integration practices. It has been observed that participation of key stakeholders has been given an upper hand in technology integration. The study recommends for educational stakeholders as well as technology designers and disseminators to join their hands and cooperate for successful technology integration in OST learning.

This study focused on the use of the best practices for OST technology integration as a catalyst for speeding up the use of educational technology for OST primary school learners. Further studies are encouraged to investigate the applicability of the proposed practices for OST technology integration in other settings such as secondary schools, rural or town per se, in-school, and in countries outside Tanzania. Where necessary, the practices can be modified in order to fit in other settings.

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