

Possibilities of using Mobile Technology to improve Early Grade Reading in Bangladesh: Towards a Practical Framework

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Abstract

Using mobile phones can enhance literacy skills such as reading. However, the success in terms of gain in reading skill using mobile phones depends on manifold conditions and factors which are context dependent. Therefore, the process of implementation of initiative that used mobile phones for boosting literacy is worth exploring in different contexts. The aim of this research project was to capture the first impression of the stakeholders related to the mBoost project, a project that used voices and text to help teachers and parents use activities to enhance children's reading skills, immediately after its piloting. Data was collected through qualitative interview, observation, and FGDs with parents, teachers, students, and relevant Save the Children Staff. This research found that three types of factors, technical, socio-cultural, and individual end user characteristics affected the implementation process in four phases (sending, receiving, comprehending, and implementing text and voice message activities) narrowing down the targeted benefits.

Key Words: ICT, Literacy, Early Grade Reading, mLearning

1. Introduction

Because of the growing influence of technology in people's lives, most educators acknowledge the need of information technology in teaching literacy skills (Means & Olson, 1995; Owston, 1997; United Nations Educational, Scientific and Cultural Organization [UNESCO], 2014). Technologies like the mobile phones can be especially exciting because they can place an incredible channel for information and service delivery in the hands of the poor, marginalized and hard to reach people at a high scale. There are a lot of projects that used mobile phones to promote education in developing countries and proved to be successful with specific conditions (Family Health International [FHI 360] and Open Revolution, 2014; Aker, Ksoll & Lybbert, 2011). The failure and success of initiatives involving mobile phones to promote literacy depends on manifold conditions and contextual factors which requires exploration.

2. Context and Rationale

Using mobile phones to promote literacy seems promising for Bangladesh for four reasons. First, Bangladesh is lagging in this area of literacy. For readers in grades 1, 2, and 3, the average oral reading fluency (ORF) rates were 16, 23, and 28 correct words per minute (CWPM), respectively. For 2nd grade readers, 1 in 4 (24 percent) and for 3rd grade readers,

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2 in 5 students (43 percent) could not answer a single reading comprehension question (United States Agency for International Development [USAID], 2018). Second, the access to mobile phones for mass people is increasing day by day. In the global market of mobile phones, Bangladesh is the ninth largest market in terms of the number of subscribers in the world. Total mobile phone subscribers in the country are 85 million, which means 51% penetration. According to BTRC (2019) total mobile subscribers stands 156 million at the beginning of 2019. Third, the political context of implementing such initiatives is fertile as the Bangladesh government has been heavily involved in promoting ICT, fronted by the flagship initiative “Digital Bangladesh by 2021” as part of the 2008 election manifesto (Global System for Mobile Communications Association [GSMA], 2017). Fourth, because of this COVID 19 pandemic school closure, using mobile phones for teaching-learning became a promising area for exploration. In total, the whole context seems very promising for introducing development projects that want to reach a large population in a distance mode for promoting literacy.

There are examples of the use of mobile phones for promoting health (Dimagi, 2012) and education in Bangladesh (Rezwan, 2007; Research Triangle Institute [RTI], 2007) and the success result is mixed and conditional depending on many factors. In 2011, Save the Children (SC) started planning for the Literacy Boost project in Meherpur District of Bangladesh to improve children’s reading skills working with teachers and communities. However, the minor improvement in reading skill for the intervention group children compared to the control group children paved the path to start a new initiative “mBoost or Mobile Boost” in August 2014 as a part of adding an extra input to the literacy Boost project. mBoost is a project through which parents and teachers receive follow up text and voice messages related to schoolwork in their mobile phones (cell phones).

Although technology promises some success to promote literacy, improvement in literacy skills is not straightforward and direct. Many different contextual factors affect the planning and implementation of this process. Therefore, this research answers the questions: what factors nested in a rural context affect the implementation of this mBoost project? and how can we improve this implementation process? The first impression of the stakeholders of this project was captured as data to answer the research questions. This research has the potential not only to help Save the children to improve their design, implementation process and strategies by knowing the challenges in implementation, but also to gain insight about how using mobile phones to improve literacy can get complex when affected by different technical and contextual factors.

3. Literature Review

Significance of reading skill:

A child’s ability to read is a salient indicator for assessing the quality of basic education around the globe (Organization for Economic Cooperation and Development [OECD], 2013). Research indicates that reading skill affects other skills such as writing, computing, problem-solving, communication and thus contribute to future success in getting and performing in employment (Levy & Murnane, 2004). Moreover, because of the global shift toward knowledge-based economies, there is a huge demand for literate workforces. Reading skill provides a crucial element in this regard.

Defining reading skill:

Reading skill is a major component of literacy. Reading skill was defined by different people and organizations using different frames. Long ago UNESCO defined a functionally

literate person as “has acquired the knowledge and skills in reading and writing which enable him to engage effectively in all those activities in which literacy is normally assumed in his culture or group” (as cited in Gray, 1956, p. 19). Some definitions focus on cognitive skills (Wagner, Venezky & Street, 1999 as cited in Wagner, Castillo, Murphy, Crofton and Zahra, 2014) and some put it in a socio-cultural and constructive framework such as how people use literacy in formal and informal contexts (Street, 1999). A significant part of this research frames reading within the socio-cultural perspective as we focus on promoting reading skill using mobile phones, as technology which is socially and culturally grounded.

Promoting reading skill through mobile phones:

Research show that reading using mobile phones introduces a tool for literacy for marginalized groups, particularly women and girls, and others who may not have access to paper books. In Africa a majority of children have never had their own books, and it is very common to share a textbook by ten to twenty students in school (Books for Africa, n.d.). People not only read for themselves but also read to children, thereby supporting children’s literacy (UNESO, 2014). Revelle, Reardon, Green, Betancourt and Kotler (2007) found that a mobile based intervention using text, voice and video for asking parents to do certain activities has significantly increased their children’s reading ability in the US. Similarly, research shows that in Uganda, mobile phones can be used to promote family literacy practices that includes reading skill among others (Sumani, Bananuka, & Busingye, 2017). Valk, Rashid and Elder (2010) reviewed the evidence of the role of mobile phone in improved educational outcomes in the developing countries’ six mLearning pilot projects in the Philippines, Mongolia, Thailand, India, and Bangladesh. Results show that there is evidence of mobile phones facilitating increased access. Yet there is less evidence that mobiles promote new learning.

Conditions and factors for promoting reading skill through mobile phones:

Wagner, Castillo, Murphy, Crofton, and Zahra (2014) analyzed a robust sample of projects of mobiles aimed at enhancing literacy. Based on the evidence from these projects they proposed a design solution framework combining intervention purposes with devices, end users, and local context.

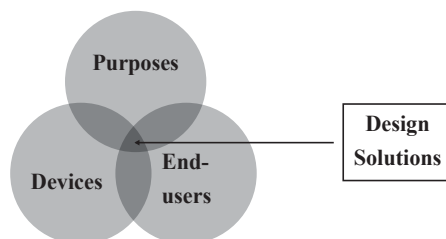


Figure1: Mobiles for literacy: An effectiveness framework (source :Wagner, Castillo, Murphy, Crofton & Zahra, 2014)

They argue that any initiatives need to clearly state the purpose of using mobile phones- what are the expectations? They explain that mobiles can be used for formal learning and instruction, informal learning, providing educational content, training, collecting data from stakeholders, communicating with stakeholders and a blend of any two or more purposes. The purpose must connect and be relevant with the characteristics of the end-users and availability, adaptability, and affordability of the device to be used. They emphasized using local language content in a low-cost device to help promote greater access to the practice of

reading (UNESCO, 2014; Wagner, Castillo, Murphy, Crofton & Zahra, 2014). Any design must consider the characteristics of the target population or community to make the design compatible with those characteristics. For example, One Laptop per Child (OLPC, 2013) project used bright colored laptops to appeal young children and the Hole in the Wall project (HIWEL, 2013) used kiosks so that the children could use it comfortably. However, not only the physical appearance, but also the cost, availability, and accessibility were factors.

Most of the research emphasized on determining the success or failure of mobile based literacy projects. Other research revealed some aspects of factors that can affect the implementation process of these projects that focused broadly on purpose, device, end user, and the local context. However the exploration of these factors can be useful if investigated in different implementation steps which is absent in existing literature. Our research revealed how in terms of benefiting the participants the implementation process gets narrowed down in different phases or steps.

4. Methodology

mBoost project started in 2014 to enhance already existing Literacy Boost project in Meherpur, Bangladesh. For the mBoost project, 18 (intervention) schools (nine from Gangni and Nine from Meherpur Sadar) were selected randomly from the 36 schools where literacy boost project was running. The intervention for these 18 schools included follow up text and voice messages targeted to all Bangla teachers and parents of the children of grade one of these schools. These messages gave them direction to engage children in activities to facilitate reading skills. By the time this study started, parents received one text and one voice message, and the teachers received one voice message, a follow up of their Literacy Boost training. The voice message to teacher was “Create a print-rich classroom-this week. Have children write their names on pieces of paper and then stick them to the walls in your classroom. Children like to see their names written down and this will make your classroom look nice and festive too! You can use their names on the wall to play many different types of games that develop so many skills.” The text message for parents was “Talk to your child-it will make them feel loved and confident” and voice message was “Build your child’s confidence by talking to her. This month talk to her about school. Ask her which subject she likes best, who her friends are, what activities she likes to play”. These messages were also sent to the relevant SC staffs (Field Officers, Senior Officers, and Deputy Managers) so that they have idea on what the teachers and parents are getting as messages.

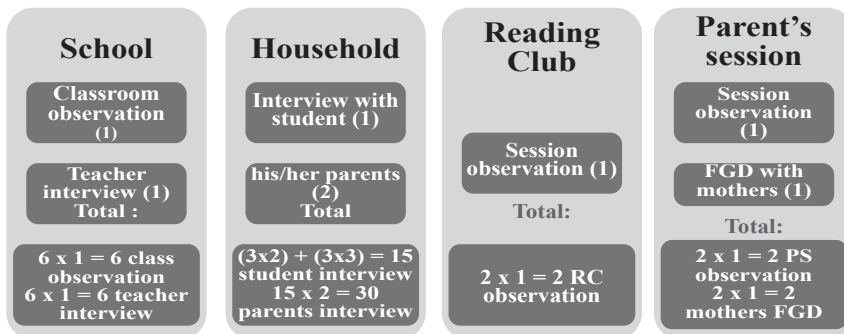


Figure2: Depiction of sample sizes and data collection tools

Data were collected from schools; households; two intervention for Literacy Boost project—Reading club and parents’ session; and relevant Save the Children staff to know their impression. Schools were selected randomly and the classrooms, teachers, parents were selected with the help of the experienced field officers of the project. Data has been collected by the researcher by observing the project sites and interviewing in-person by going to households and schools with the consent of the research participants signing consent forms written and explained in Bangla. Qualitative data were analyzed thematically using steps to incubate in data and producing interrelated themes (Rossman & Rallis, 2012) presented in the findings chapter. This study is explorative in nature and does not use any specific theoretical framework, rather data from this research aimed to produce a practical framework of guiding implantation of the mLearning projects.

5. Results

Technical Aspects of Communicating Information using Mobile Phones

The project aimed to send voice and text messages to the parents and Bangla teachers of grade one students of the intervention schools to boost up their literacy practice especially reading skills. As the project relied on mobile phones, parents who did not have mobile phones (11.15%) were left out from getting the mBoost intervention. Our voice calls were 35 seconds and 53 seconds in duration for parents and teachers, respectively. In our first attempt to call 1328 valid numbers, we could successfully reach out to 711 numbers only. The total duration of listening was 203 minutes and 45 seconds leading to an average of 17.19 seconds per number. The technical aspects that limited the communication via mobile phones include switched off mobile phones, phones out of network, limit in length of text and voice, Bangla font incompatibility for many mobile phones, and not being able to show ‘SAVE THE CHILDREN’ in the message mask (the title that shows up in the mobile phone of the receiver as sender of the text) which if included could increase the number of reader and listeners as reported by the parents.

Accessing Content after Successful Transmission

There were cases where parents, teachers and SC volunteers could not access the successfully transmitted text and voice messages. It was not possible to verify by the technical authority if text messages were consumed by the target population. Therefore, we collected this information from the interview sessions with the receivers. In some cases, we helped them to search and find SC text messages in their phones during interview sessions. However, it was not possible to know about the missing voice messages as most of the parents use mobile phones which did not have memory to show more than 10 previous calls. So, we report their self-reported data about receiving the voice messages.

Table 1 shows limited reachability even after the successful transmission of text and voice messages. Almost half of the parents missed the voice calls, and more than half of the parents did not read the text messages, although they have received it.

Table 1: Success of reaching parents and teachers via text and voice messages (total number of household interviewed=15)

Mode of data collection	Voice message (self reported data)			Text message (self reported and verified by researcher)		
	Not received	Received & partially listened	Received & listened	Not received	Received but unread	Received & read
Parents from 15 households	7	5	3	3	8	4
Teachers (6)	-	1	5	-	-	-

The teachers were more successful regarding receiving and listening to the voice messages. This can be because all of them used their personal mobile phones to receive and listen to the voice calls, which was not always the case for the parents as they sometimes shared one phone with other family members. As the voice call was something relevant to their classroom teaching, most of the teachers paid close attention and listened to the voice messages, which was not the case for the parents.

From the interview sessions with parents, we found that they faced several challenges to access our transmitted content, both text and voice. One major issue was that they were not aware that SC would be sending any message to them regarding their children. During the interview with the households and FGDs with mothers, we learned almost all the parents (95%) referred this as a major cause for not reading the text messages. They also did not realize that the sender of the message was SC – a technical limitation that we described earlier. For voice messages, some of parents also told that they did not listen to the full voice messages because they assumed that it is an unimportant voice calls from cell phone company.

Another reason for limited reachability of the voice was the time of receiving the message. Mobile phone in a household usually belonged to the fathers of the students and most of them were out of home for different kinds of businesses where they were unable to receive voice messages. Some of them reported that they were in bazar or in other gatherings where it was not possible to listen carefully the voice message, or even to receive the call. Parents suggested that voice calls at a specific time of each week would increase reachability. Most of the parents mentioned that any time after the Magrib and before Esha prayer is a good time for receiving a message as they are home at that time with most of their family members. Interview with the teachers also revealed the importance of timing. They preferred to receive the text and voice messages when they are at the school. In that case, they can think about the practice that was asked to do over the message and be prepared for that day or next day according to the message in the school. Uncertainty of Financial Implications also impacted reachability of the voice messages. Some parents were not sure about the cost involved in listening to them. On the other hand, almost all the teachers (98%) were clear about the idea that just receiving text or voice call will not charge any cost.

Most of the parents (80%) who did not read text message said that they do not use this option frequently in their regular communication – resulting in a preference over voice calls. However, after knowing the specific limitation of the voice message, as it will ring for twice if missed the first one and then will never come again, they preferred text message over voice

message. Finally, they recommended SC to send both voice and text messages so that, if the voice call is missed, they can retrieve it from text message. Unlike the parents, the teachers preferred text messages over voice message, as it is more permanent than the voice call.

Some of the parents (50%) told that they do not know how to read, and that deterred them from opening the text messages. Some parents could read but it was hard for them to read Bangla in English font and that was why they could not read it even after opening the text message. They preferred Bangla language for text messages rather than Bangla written in English font, which is hard for them to decipher even if they can read. Teachers also preferred Bangla language for the text messages for the same reason. SC volunteers think that the message needs to be sent using both Bangla language and English font for Bangla language (this is a backup as not all the mobile phones are compatible of receiving Bangla fonts).

Comprehending the Received Content

One major challenge for the parents to comprehend the voice and text messages was the linguistic difference that exists between local language and formal language used in the messages. Specifically, they struggled to understand the meaning of some words and comprehended a meaning that was different from a dictionary meaning. For example, for a Bengali word, “Attobishshash”, for which the original dictionary meaning is confidence – the parents interpreted the meaning as intellect, courage, quality, memory recall, and even affection. Moreover, there were some words, which had different colloquial meanings in that region which were different than the dictionary meanings or grammar. For example, the synonym of the word “word” is “Shobdo” defined both by Bangla grammar and Dictionary. However, in the community they prefer “kotha” to be as synonyms of “word/shobdo”.

Another interesting finding on comprehension was that mothers could better interpret the original meanings of the words we used in messages compared to the fathers. It may be because only the mothers went to the parental awareness session and they already got the main idea of the message at those sessions. There was little or no sharing between the mother and the father about what the mothers learnt in the parental awareness workshops for most of the households.

Parent’s own perception about child’s education and their other previous experiences led to at least partially unintended comprehension in almost around 80% of the cases. For example, Abdul Moin, father of Zakir, was comparatively rich in the community and was really worried about the other children in the community who do not go to the school and play in the field all day long. He interpreted the message: “Build your child’s confidence by talking to him/her. This month talk to him/her about school-ask him/her which subject s/he likes best, who his/her friends are, what activities s/he likes to play” as, “It is good to monitor my son’s way of mixing up and making friends. Not all friends can be beneficial for him. If someone is bad for him, I can instruct him not to mix with that boy.” Several SC staffs suggested using a voice and tone of a local woman rather than using an urban mainstream tone of language to improve the understanding as well as to grow interest among parents.

On the other hand, all the teachers who have read the text message or listened to the voice message comprehended the messages almost the same way. The words they used to describe the message were similar, keeping the information intact. In one case, especially for the voice message, it was not listened properly and thus was not interpreted in a totality.

Implementing the Received Content

We found that even though parents felt that it was feasible to implement our messages, only two out of six tried to implement the message – even if all of them either read the text, or listened to the voice message or have done both. Jobbar Ali, a solvent farmer who works in the paddy field told that after listening to the voice message in the paddy field he talked with his daughter in the evening after coming back home. He asked his daughter “how was your learning in school today”, and a follow up question, “were you disciplined enough in the school?”. He mentioned that “I forgot the examples of the questions that I listened in the voice message. When I came back home in the evening, I just remembered that it is good to ask questions about children’s education.” Some parents said that they did not take it seriously as they were not sure who was sending this.

Some evidence during data collection showed that the children felt a notion of importance as the messages were about their learning enhancement. In the reading camps some children were gossiping, and one told to other (may be as they saw me) in low voice, “Did you get any message in mobile phone? My parents got message in the mobile phone and it was about my education”. He was excited and happy while saying so. The other boy replied, “I do not know. I will ask my father after going back home”. In the interview with the household, Sumon, the youngest son among the three siblings asked, “Can you send something that we can read? Or listen?”, which gives idea for further use of text messages directly involving the children.

Five among six teachers thought that it was easy and feasible to do what the message was telling them to do. Two teachers mentioned that sometimes the relevancy of the text and the physical facilities were the issues. Two teachers argued that the message might not always well flow with their own flow of classroom teaching plan. Susmita Saha told that, “For example, I plan to teach a poem next day, and you are asking me to read them a story. That can be problematic as we have our own flow of teaching instruction”. Shaeen Ara Sultana, a Bangla teacher for grade one, who is teaching in that school for 3 years said, “The message instructs us to hang the students’ names written in pages in the classroom wall. But in our building the wall is so damp, that we cannot hang anything, even for a while. It is always wet. We tried to put newspaper to cover the whole wall, and still it did not work. Come with me, I will show you the condition”. However, some teachers came up with alternatives such as preparing name tags for using in the dress or to stand in the table folding it to make a v-shaped name tag.”

6. Discussion and Implications

This research revealed how the inputs of the mLiteracy project got trickled down in terms of benefiting the participants in the implementation process in four phases. In the first phase while establishing the communication with participants or users, the main issues were technical such as switched off phones and users having devices not compatible for Bangla language. This is similar with the factors described as devices and purpose in the meta-analysis of Wagner, Castillo, Murphy, Crofton & Zahra (2014). The next two phases of accessing the content and comprehending the content by the participants depended a great deal on the socio-cultural context such as education, awareness, readiness, family role, and linguistic factors which is similar to the factors described in the same literature as local context and emphasized by others (street, 1999). The last phase, implementing the content, mostly depends on personal level of motivation, awareness, and creativity described as the factor end user (Wagner, Castillo, Murphy, Crofton & Zahra, 2014; OLPC, 2013; HIWEL, 2013).

This is tempting to present the result of the evaluation study of the mBoost conducted to reveal the effect of this project after revising the project based on the findings and recommendation of our research. It shows significant gain in literacy due to this project which is similar to other research that shows that mobile technology can promote literacy (Revelle, Reardon, Green, Betancourt and Kotler, 2007) especially among marginalized groups and in developing country context (Books for Africa, n.d.; UNESO, 2014; Sumani, Bananuka, & Busingye, 2017; Valk, Rashid and Elder, 2010)

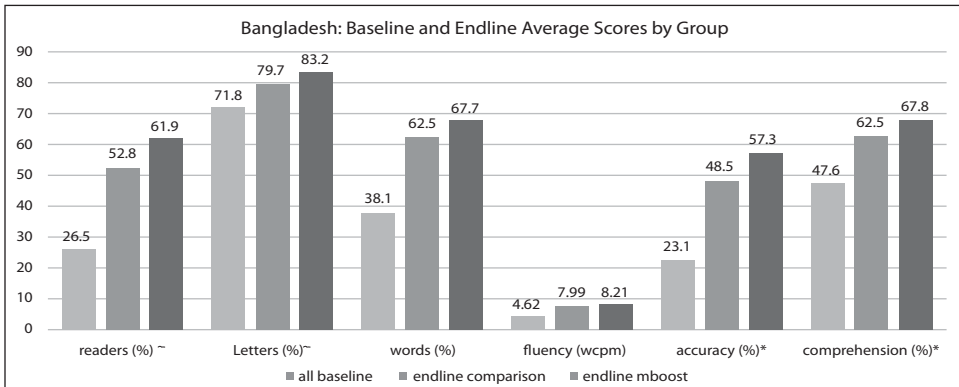


Figure 3: Comparison of reading skill performance data of baseline, end line and mBoost

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Therefore, we can assume that the findings of our research shed light on the possibilities and challenges of using mobile phone for promoting children’s literacy in such a way that it can provide a practical framework for the implementers of such projects to identify their challenges beforehand and situate the project in their local context.

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