Impact of Computer literacy, Communication and Comprehension skills using an online pedagogical tool during COVID

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Abstract: There is a huge gap between the 'know' and 'know nots' not just in remote villages of India but in metropolitan cities like Delhi, Mumbai etc. This difference was more pronounced during COVID times when educational institutions shut down Pan India for over two years. This research study is an attempt to engage with underprivileged children during COVID using online interactive edutainment games. It focuses on three critical skills namely digital literacy, reading comprehension and communication skills. According to Prof Mitra (2020), the future of learning is dependent on the 3Cs namely ability to comprehend, communicate and compute. According to him there is a big gap between Industry need and Graduate skills. Hence, it is imperative to nurture these skills. In the present study, underprivileged children were given hands-on activities via online platform i.e., mobile phones facilitated by a local person who provided a nurturing environment to these children. Another important aspect of this pedagogy was children working in groups. Results indicate that children picked up the 3 skills. Wherein, digital literacy did not show any significant results, while there was significant improvement in communication and reading comprehension skills. This study also suggests that if children perceive the content interesting and engaging and the environment as non-threatening then learning is inevitable. Schools if complemented with such intervention(s) can help in bridging the gap between the 'know' and 'know nots.'

Keywords: *Communication; Comprehension; Computing; COVID; Collaboration; Pedagogy*

Background

NIIT Foundation (NF) is a not-for-profit education society (NGO) set up by the promoters of NIIT in 2004. Its mission is to positively impact the underprivileged of the country through educational initiatives and skill development programs. It has set up skill development and vocational training centers in urban and rural areas that offer placement support to all eligible students. It ties up with various corporates to extend its reach by implementing these programs. NF partners with corporates to take this forward. In the present study, NF partnered with a Foundation of a Corporate to setup Hole-In-The-Wall learning station alongside Digital Learning Center (DLC) in different states to provide and support digital literacy among the children and help children of the village with the access to the technology. NIIT Foundation and its partner company constructed well-designed DLC rooms, and two Hole-in-the-wall Learning Stations loaded with Interactive Multimedia Educational and Life Skill E-contents and Internet facility for digital literacy.

Literature Review

India is a country with a population of 138 crore (1.38 billion) people. Of which 65% represents rural India contributing to 25-30% of the country's GDP. The gap between the rural and urban India is huge. One- fifth of the people from rural India migrate to cities and towns (Mitra and Mayumi, 2008). Delhi has the second largest destination in India after Mumbai, where 43.3% of the total population consists of in-migrants (Census of India, 2001). Possible reasons for migration could be availability of better job opportunities, better lifestyle and better connectivity (roads, railways, telecommunication systems), etc. This may seem to be a progressive move on the part of the villagers but there are huge challenges that these migrants face. Children of migrant and/or underprivileged parents either work or are at home helping with household chores. This is especially true for girls who help raise their younger siblings. These children are often seen skipping school and get caught in a cycle of poverty by foregoing their education.

Indian government has made considerable efforts to provide access to basic education. However, it still seems to be a far-fetched dream. ASER 2018 report states that most students are progressively left behind over the years. There is a need for immediate intervention at the primary level to improve the learning skills. Unfortunately, the advent of COVID 19 brought the entire country to a grinding halt and created a huge backlog. A 2020 study by the Ministry of Human Resources (MHRD) found that the learning of about 240 million children who were enrolled in the school got severely affected amid COVID 19. According to UNESCO, approximately 0.32 billion students in India were affected by school closure due to the pandemic COVID 19. Out of these 84% reside in rural areas while 70% are from government schools (Alvi & Gupta, 2020). The reasons behind this are lack of qualitative education, infrastructural gaps such as electricity, water, sanitation, books, library, notes, etc. all integrating into becoming a bigger problem with upcoming days. Thus, the impact on children from deprived, disadvantaged, or vulnerable sections were more adversely affected than children from privileged backgrounds (Alvi & Gupta, 2020). A study conducted on about 1,400 school students (between Grades 1 and 8) from underprivileged backgrounds has highlighted just how big a hit their education has taken since last year, when schools were closed due to the coronavirus pandemic. In rural areas, the study found that only 8% of the children were attending online classes. Interestingly, studies also found that Internet access can provide underserved students with otherwise unavailable sources of information (Levin and Arafeh, 2002).

Present study

Since March 2020, Pan India lockdown was levied across all the states. As a result, one of the offerings of NF i.e., Hole-in-the-Wall learning stations was shut down. Instead, NIIT Foundation started an online program named 'Learning Masti' for children. As the name suggests these are a series of online fun activities that were introduced to keep the underprivileged children engaged and give them some semblance of learning, especially when schools were nonoperational. These activities were specially designed to make online sessions interactive and engaging for children. ASER report (2018) suggests that focusing on play-based activities that build memory, reasoning and problem-solving abilities is more productive than an early focus on content knowledge. Thus, the main objective of Learning Masti was to inculcate happiness quotient among children by keeping them meaningfully engaged.

'Learning Masti' has a local facilitator who connects with children through online mode like WhatsApp video call and/or Google meet. The content consists of creative activities encouraging interaction between children. It is important to understand that the facilitators were local and hence understood the challenges faced by children. They are committed to the cause of mentoring underprivileged children. Also, the focus of the content was to encourage three basic skills namely, communication skill, reading comprehension skill and digital literacy skill. According to Prof Mitra (2020), the future of learning is the 3 Cs and not the 3 Rs. In other words, it is communication, comprehension and computation skills and not reading, writing and arithmetic skills that are critical. On the contrary the 3Rs get subsumed under the 3Cs.

Communication skills which refer to the ability of expressing one's opinions, desires, and needs, apprehensions. For example, a topic is given to a group consisting of 3/4 children and each child is asked to share her/her feelings and thoughts. Literature review suggests that if children are made to learn to communicate well in early childhood, odds are they will not struggle to read in school. This explains why many Indian children (especially from low-income households) grapple with reading or comprehending English—a language that is absent in their homes (for which they have no orality). Keeping this in mind, children were asked big questions and encouraged to deliberate in the group and share their views. These big questions were designed to provoke curiosity. An example of a big question is 'Why are leaves green? Or 'Why does it rain?'

Reading comprehension involves thinking about the words that were just read and deriving a meaning from the text. In the present study, children were shown stories around a picture and were asked to read the passage and answer questions preferably in English. The stories that were selected were age appropriate. Literature review suggests that reading comprehension is a complex higher order process and is beneficial for children. According to Alexander & Fox (2008) and Schroeder, Hyönä, & Liversedge, (2015), well-developed reading skills are essential for children to be successful in later academic achievement as well as professional life. Reading is an important gateway to personal development, and to social, economic and civic life (Holden, 2004).

The third component is digital skills. Literature review suggests multiple and overlapping understandings and uses of the terms 'digital literacy', 'digital skills' and 'digital competencies' (Brown et al. 2016). The broadest concept of digital literacy was provided by Jisc (2014). According to him, digital literacies are those capabilities which fit an individual for living, learning and working in a digital society. While there is worldwide recognition of the importance for children to be digitally literate (CoE 2018, UNICEF 2017, UNESCO 2017, among others), there is a lack of global data for children's digital literacy. In the present study, children used their mobiles for online sessions which also included activities to be done at home. The very fact that they used mobile phones meant that they were becoming aware and competent in using the digital space.

Intervention: 'Learning Masti' is an online intervention for children in the age range 6 to 14 years. Weekly sessions were held with children for a duration of 45 minutes to 20 minutes. These activities were fun, engaging and completely voluntary. They were not a part of the school curriculum. Facilitators were trained in a two-day workshop on how to engage with children and to provide a safe yet encouraging environment. The principle behind pedagogy is that of SOLE i.e., Self-Organized Learning Environments. In a SOLE the learners self-organize themselves in groups and work using the Internet. The teacher's/mentor's role is to facilitate this process by asking big questions and letting the students find answers. The SOLE approach thus provides freedom and autonomy to the learners. According to Mitra, 'Communication and collaboration are therefore key features of a SOLE. Mitra et al [2016] claim to demonstrate that in SOLEs, students: i) gain confidence, ii) become capable of dealing with big challenging questions, iii) learn things ahead of their age, iv) retain knowledge longer, v) enjoy learning together, and individually and vi) improve their computer and English language skills SOLE as an alternative pedagogy, wherein groups of children learn by themselves. Thus, SOLE suggests that if the environment is perceived as nurturing and is free from fear, then groups of children will organize themselves to learn and engage in any activity. There is free flow participation and engagement between children and the facilitator. Care was taken to undertake the online activities when children were free and could participate. The response from children and parents was huge during COVID. This was mostly because children had stopped going to school, parents were home.

Figures 1.0 and 2.0 are examples of activities in the Learning Masti module.

Fig 1.0: Learning Masti home activity   Fig 2.0: Learning Masti fun activity

Methodology

The duration of the present study was 8 months. It started in August 2021 and ended in March 2022. The sample has been taken from six states of India namely: Tamil Nadu, Gujarat, Bihar, Rajasthan, Punjab and Odisha. The sample size = 52. These children are in the age range of 6 -14 years belonging to lower socio-economic strata. Parents of these children are migrants who have shifted to a city for better livelihood but are mostly daily wagers, or maids, cooks, etc. They typically live in a one room house which is mostly illegal construction with extremely challenging living conditions. A random sampling was done, and t-test was applied to determine if there was a significant difference between the means of the two groups.

Facilitators: The Learning Masti intervention was conducted by local facilitators. These facilitators are on NIIT Foundation payroll and have been working with underprivileged children as a part of their job. They stay in places close to these children. As mentioned earlier, they underwent an intensive workshop as to how to conduct the 'Learning Masti' sessions with certain dos and don'ts. They made a calendar of activities on how and when to conduct these online sessions. Facilitators were asked to make groups of 4 children for their sessions. Basically, these sessions were conducted in groups.

Tools: Tools used were Communicational Skills, Digital Skills, and Comprehension Skills. These tools are developed in-house and have items related to content.

- **Digital literacy**: To measure digital literacy, questions like how to open a downloaded file were asked. These children are using their mobile phones for the online sessions and if they attended sessions, they would have done the activities stated in questionnaire. In total there were 15 items.

Fig 1.0: Sample of a few questions on digital literacy

- **Reading Comprehension**: To measure comprehension skills, children were given a standard age-appropriate paragraph with four questions based on the paragraph. Figure 2.0 is a snapshot of the paragraph.

Fig 2.0: Snapshot of the story on reading comprehension

- **Communication Skills**: This questionnaire assesses the ability to answer some basic questions in a language comfortable for children. In total there were 23 items. The facilitator asked the questions and children responded to the questions. There was no fixed answer, but a coherent, meaningful answer was required. The facilitator rated children on confidence, clarity, coherence as well.

Fig 3.0: Sample questions on communication

Findings and Discussions

Let us now examine each of the 3 skills before and after the intervention.

Table 1.0: Digital Literacy skills

Digital Literacy		
	Pre	Post
Mean	51	62
STD	13	14
N	52	
P value = 8.14. Not significant difference		

According to table 1.0, there is no significant difference between pre and posttest in digital literacy, thereby indicating that children were unable to pick digital literacy skills during the 8-month intervention period. They scored 51% in pretest and 62% in posttest. One of the possible reasons for not being able to pick up digital literacy could be the duration of the program. Had the program been longer, it is possible that there would have been a significant difference between pre and posttest. Another possible reason could be attributed to children not getting enough practice at home, as they were sharing their parent(s) mobile phone. Also, at times, children were unable to attend session(s) as they did not have phones with them. This phenomenon was observed towards, mid of February onwards, when parents started going to work. The posttest marks seem to have marginally increased but not significant enough.

Table 2.0 – Overall Evaluation – Reading Skills

Reading Comprehension		
	Pre	Post
Mean	13	27
STD	18	24
N	52	
P value = 0.0004. Highly significant at .01 level		

Table 2.0 indicates that children have picked reading comprehension skills. The pre and posttest difference is significant at .01 level. Even though their reading comprehension skills were not high to begin with, pretest was 13% and posttest was 27% with a high standard deviation, 18 and 24 respectively. It clearly indicates that children's ability to read and comprehend in English was relatively poor but improved gradually. The facilitator was instructed to read the passage in English and ask questions in English. As, most children were not comfortable in English, the facilitator explained in local dialect. As this was a group activity, children who were more conversant in English were able to pick up this skill and at times, help the not too bright children. This can be seen in the high standard deviation suggesting a high variation among children. These findings do not come as a surprise as literature review suggests that rural India and children from underprivileged background face a lot of challenges. ASER (2018) reports that In Std V, while 50% of all children can read Std II level text (or even higher), the rest are not yet at Std II level. Close to 18% of children are only able to recognize letters or yet to acquire that skill. 13% can read simple words but not sentences and another 19% are just about reading text at Std I level.

Table 3.0: Communications skills

Communication		
	Pre	**Post**
Mean	61	66
STD	10	10
N	52	
P value = .003. Highly significant at .05 level		

If we examine table 3.0, it shows that children have picked up communication skills. There is a significant difference at .05 level in the pre and posttest. Every aspect of learning relies on good spoken language skills. Spoken language skills have a significant impact on academic achievement and are considered crucial for the social and emotional wellbeing of an individual. As stated earlier, one of the features of this intervention was to encourage groups of children to interact by means of talking to each other as well as the facilitator. Interaction among children was praised and appreciated verbally by the facilitator. A lot of time was spent on getting children

to express themselves either basis a topic or else to generally talk about their feelings. Care and effort were taken to allow each one of them to speak openly and freely without being judged or criticized.

Literature review as early as the 1960s by researchers (e.g., Hall, Lund, & Jackson, 1968), Hall, Panyan, Rabon, & Broden, (1968), Madsen, Becker, & Thomas (1968) examined the effects of teacher praise as a form of positive reinforcement to improve students' classroom behavior. Adults enjoy giving children praise, and children enjoy receiving praise (Brummelman, Thomaes, Overbeek, et al. (2014), Hattie & Timperley (2007), Leijten et al., (2016). Thus, praise nurtures self-confidence and a sense of self.

Thus, one can summarize by saying for any learning to happen, it is important for the learner to feel safe, comfortable and encouraged. Learning should be exploratory in nature wherein groups of children should be encouraged to work together. Collaboration being one of the pillars of an effective pedagogic tool. This lends self-motivation among learners irrespective of their economic and social challenges. Gardner (2010) defines motivation as the love, desire and positive attitude towards acquiring and learning. Benson (2001), in his book 'Teaching and Researching Autonomy in Language Learning' provides techniques to create autonomous learners. He believes that learner autonomy can be fostered if students are given independent interaction with learning materials and technology, if the importance of their behavioral changes is stressed and if they are supported by teachers in fostering their autonomy. Thus, motivation, autonomy and collaboration are crucial for any learning to happen. 'Learning Masti' was an intervention that adopted these three pillars and even though the learners were coming from underprivileged backgrounds with limited resources, they were able to pick up the 3 skills despite the challenges.

Limitations and Future initiatives

One of the biggest shortcomings of the present findings is the sample size. Initially, the sample size was relatively bigger but towards the end, there were dropouts primarily because parents started to work and thus children had no access or very limited access to mobile phones. Also, at some sites, a few facilitators left and hence, post testing could not happen. Amidst all these shortcomings, the results of this study seem fairly encouraging. The interactive, engaging content and the pedagogy led to improvement in communication skills and reading comprehension skills of underprivileged children. Improvement in digital literacy was not significant. We can beyond doubt attribute this improvement to Learning Masti sessions as there was no other tangible input for these children. Government schools had closed for the entire 8 months period. It is equally important to realize that these online sessions were taking place amidst a lot of environmental challenges faced by both children and facilitator. They were the non-availability of mobile phones, electricity issues, fear and anxiety due to the onset of Covid to name a few.

It is recommended that alternative pedagogies should be complemented along with formal education. It is a known fact that government schools lack trained teachers, have inadequate education materials and poor infrastructure that makes learning difficult and challenging. And even though governments have and are taking a lot of initiatives. There is a big need for private companies and NGOs to collaborate in attempting to provide quality education.

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