Online Learning for The Youngest of Learners: A Case Study

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ABSTRACT
The COVID-19 pandemic has led to months of school and kindergarten closure which forced rapid adaptation and transition on schools. While school-aged children and adults are frequently exposed to online learning platforms, preschool aged children are rarely considered a capable or appropriate audience. The pandemic, however, opened a void in early education which internet-based education could fill.
This study examines the online learning platform created by a kindergarten in Shanghai. Soong Ching Ling Kindergarten created the program in the face of the pandemic to meet learners' needs during school closure. At the time of writing, the kindergarten's 922 students aged two to six had been offered 108 daily learning units. This study reviews the skills, concepts and topics covered by the kindergarten's epidemic program during the pandemic.
Furthermore, the research analyzes survey results from 753 parent participants whose children were exposed to the kindergarten's online learning material. The practicality, prominent advantages and frequent complications of the program are presented based on quantitative findings. The study provides unique insight into the realm of online learning for pre-school aged children from which educators, parents and administrators can benefit.

Keywords: Online Education/ Early Education/ Computer Interactions/ Kindergarten, COVID-19/ China

1. INTRODUCTION

The everchanging, modern world has altered the way human beings teach, learn, communicate and interact. The shift to online courses as a viable alternative to tradition face-to-face instruction has already found its place in the higher education setting. Yang and Cornelius (2004) note that "online learning has now become an integral part of higher education institutions' expanding curriculum" (p.861). While older students have become accustomed to the multifaceted realm of online learning, younger students are rarely considered as the target audience.

This study examines an online learning program specially created for preschool aged children. Online learning or distance learning has been defined by the U.S. Department of Education (2010) as "learning that takes place partially or entirely over the Internet" (p.9). Volery (2000) asserts that online delivery is a form of distributed learning enabled by the Internet. The development of online learning technologies and the increase in users has become an accepted innovation of twenty-first century education. Stack (2015) notes that in 2002 "a total of 1,602,970 students in higher education took at least one course online [and] by 2011 6,714,792 students took one or more online classes" (p.1). Young and very young learners, however, have been predominately excluded from the realm of distance education.
The advantages of distance learning have been analyzed by multiple scholars. It has been found that

online learning creates the possibility of providing a world class education to anyone with a broadband connection (Bartley & Golek, 2004) and is cost-effective (De la Varre, Keane & Irvin, 2011). Gilbert (2015) states that "the benefit of flexibility in online courses cannot be overstated" (p.6). Chaney et al. (2010) discuss the non-restrictiveness of online learning and asserts that the demand for online courses is derived from a push "to provide quality education to all students, regardless of location and time" (p.21). Moreover, "online learning allows for students to work at a time and a place that is compatible with their learning needs" (Gilbert, 2015, p.6). Regarding financial advantages, Bowen et al. (2014) note that a hybrid model of instruction in large introductory courses has the potential to significantly reduce instruction compensation costs in the long run.

The advantages appear plentiful; however, will the same benefits be viable with young students? The present study examines the effectiveness of an online learning program aimed at learners aged two to six. Concerns regarding self-management skills, the negative impact of excessive screen time, shorter attention spans and the need for hands-on learning are among the causes that have led to the underdevelopment of online learning for younger learners. Colorado and Eberle (2010) have noted that older students' success in online learning may be due to increases with age in levels of rehearsal, elaboration, critical thinking, and metacognitive self-regulation, each of which may contribute to success in online coursework." (p.6)

The unprecedented pandemic situation caused by the COVID-19 outbreak, which started spreading in January 2020, forced an abrupt and immediate change upon all areas of life, not excluding education. Educational institutions around the world were faced with an unprecedented occurrence-unforeseen, open-ended school closures. Each school, district and nation dealt with the unfortunate situation using unique strategies and management techniques. This study examines one school's innovative approach.

2. THE PANDEMIC LEARNING PROGRAM

The Pandemic Online Learning Program was created by the educational team at Soong Ching Ling Kindergarten with its first lesson debuting February fourteenth 2020. The kindergarten is located in Shanghai, China and serves a student body of 922 students. Students, aged two to six, learn and grow in the school's Nursery, Kindergarten, Reception and Year One classes. The school has a very positive reputation in the city. It is regarded as a forerunner in early education by most Chinese families. The majority of Chinese believing the kindergarten is living up to its motto of 'Giving Children the Most Valuable Things'. The school's administrative and academic team organized the Pandemic Online Learning Program, hereafter referred to as the program or the online program, to cover various topics that students would have learned had they been physically present at school.

2.1 Design of the Program

The program is designed to teach concepts and provide the materials and activities that foster academic and social growth while reducing the stresses of the pandemic situation. Moreover, the program supports parents on how to engage, entertain and bond with their young children during the unexpected school closure. Program content includes bilingual literacy, math, social-skills, physical education, science, geography and arts. The content was posted Monday to Friday on the school's official WeChat Platform. The program was adapted from the current multi-cultural curriculum of Soong Ching Ling Kindergarten mostly based on multi-cultural education theory, constructivist curriculum theory and Dewey's theory on pragmatic education. The school curriculum, and thus the

online program, are also entwined with the pedagogies of STEM education and Montessori education.

Each lesson of the online learning program is typically composed of three parts: introduction of a particular topic, followed by games, crafts and experiments on the topic and a collaborative component which involves sharing ideas and feelings with peers, teachers and parents. The lesson on mold, for example, first posed the questions 'what is mold' and 'where does it come from'. Students' predictions were elicited through the use of pictures. The second portion included an experiment where the children, along with adult supervision, would place a piece of bread in a Ziplock bag, and observe the changes. After a few days, the children would be asked to share their findings with their parents and conclude their ideas.

Another topic, titled 'Save the Rhinos' was focused on the protection of endangered animals. The lesson started with a video complied of some students sharing their knowledge about rhinoceros and answering questions regarding the poaching of rhinos. Then, information on the topic was presented through the use of stories, pictures and songs. The lesson included a pantomime game that introduces various endangered animals and a physical activity game of 'Charging Like a Rhino'. The lesson also introduced a six-year-old child who raised awareness about the endangerment of Rhinos and encouraged students to stand up for animal rights as well.

The online learning program incorporates all teaching departments. Therefore, the art department and physical education department are also frequently sharing lessons to engage and educate learners at home. The fine arts lessons are mainly composed of videos, crafts and online exhibition of the art works of children. The art lessons also introduce various artistic techniques and styles, often encouraging students to try the new art or craft at home. In other lessons, musical education is emphasized. Songs, chants and rhymes in both English and Chinese are frequent elements. Often, these resources are converted into interactive musical games for the children to do at home. The inclusion of games is an important element because the program developers believe parents feel more comfortable, and capable, in these types of interactions.

Science and math are typically embedded in the lessons to promote the cognitive development of the children without becoming too direct or demanding. Key concepts such as numeracy, shapes, patterns, probability and positional language are reinforced as integrated parts of the other lessons. The physical education lessons, for instance, include instructions recycling positional language and the names of body parts. Art lessons also form good foundations for cognitive subjects. One fine arts lesson focused on the artistic style of Yayoi Kusama, the Japanese artist, and her use of dots. The early education concepts of colors and patterns were emphasized and students' creativity was nourished with the exemplification of Kusama's work. The lesson concluded with students being asked to observe their surrounds and create images using dots like Kusama.

The program's STEM based investigations and mathematic games are designed to be interactive and engaging without requiring expensive resources or having lengthy preparation procedures. These considerations are all based on the program's mission to enhance parent-child interactions by making it productive, stress-free and pleasurable for both the caregiver and the child. All experiments and games make use of household materials, such as straws, cardboard and left-over boxes. The games are usually open to various ways of playing to further help the children think flexibly.

2.2 Accessibility of the Program
The program was published on the school's official WeChat account every weekday during the school closure period in Shanghai, China. WeChat is an extremely popular social media application in China. In China, it is hailed as a super application because it includes everything from instant messaging, to payment, to online shopping. It is noteworthy that downloading and using WeChat is free. The various features and mini-programs within the application have made it a staple on virtually all Chinese devices. In a metropolitan city such as Shanghai, the use of WeChat official subscriptions, such as the school's official account, is highly popular among users of all ages. It can be concluded that the popularity and accessibility of the hosting platform, WeChat, greatly aided the timely and effective distribution of the online learning program.

3.METHODOLOGY

3.1 Participants. Parents whose children attended the kindergarten and consequently had had access to the epidemic online learning program were selected as the study's participants. 753 parents completed the survey. 670 participants went on to complete the portions of the questionnaire regarding their perception of the effectiveness, challenges and benefits of the online learning program. The participants were not selected by the authors, rather the survey was published on the kindergarten's social media account and parents were asked to cooperate on a voluntary basis. All participants had at least one child enrolled at Soong Ching Ling Kindergarten with some having two or three children accessing the program. All participants had access to the internet. Moreover, the survey ensured participant's anonymity therefore no questions regarding name or personal background were asked. Prior permission was obtained from the school administration to distribute the survey among parents via a quick response (QR) code.

3.2 Data Collection Method. The participants completed a 9-question questionnaire categorized into four key areas. Firstly, background information including details regarding who supported the child's learning, how much time was spent each day and their general acceptance of the program were assessed. The second portion used five Likert-scale items to assess the perceived effectiveness and a rating scale to rate advantages of the program. Portion three of the questionnaire included a Thurstone scale through which encountered complications were noted. The final section of the parent questionnaire assessed favored elements of the program and parent's preferred future topics using interest inventory questions. The survey was published online through the Chinese mobile application Wenjuanxing.

3.3 Design and Procedure. The design of the study was a cross-sectional survey research. The data was collected only once in early May of 2020. The survey was uploaded onto the internet via Wenjuanxig, a Chinese surveying application similar to Survey Monkey. A quick response code (QR code) was generated and distributed among the kindergarten parents through the school's social media, WeChat, groups. The code was accompanied with a brief message asking parents to complete the questionnaire regarding the epidemic online learning program. Once parents scanned the QR code, they were directed to the survey web page where the questions were displayed in list format. Using the web survey proved advantageous since it eliminated mail costs, enabled rapid data collection, increased sample size through ease-of-use and allowed for all parents regardless of current location to participate in the study. The survey was piloted on five staff members prior to official publication and an approximate completion time of 8 minutes was calculated.

3.4 Audience Reception. The survey data indicated strong program reception. When asked if their child had used the program, despite it being completely voluntarily, 87.8 noted that they had in fact utilized the daily programs. Moreover, those who expressed a lack of interest in the program cited a lack of time (36.9 percent) or participation in other online classes (35.8 percent) as the cause. Only 1.7 percent of survey participants noted the program as 'not useful' or 'not interesting'.

3.5 Program Effectiveness. To evaluate the effectiveness of the program, five areas of practicality were surveyed using a Likert scale. Participants rated the categories of Academically Effective, Opportunities to Interact, Entertaining during School Closure, Ease-of-Use and Effective at Providing Tips for Better Future Interactions. The percentage of individuals, from 670 participants, who responded completely agree and agree to each category is presented in Table 1.
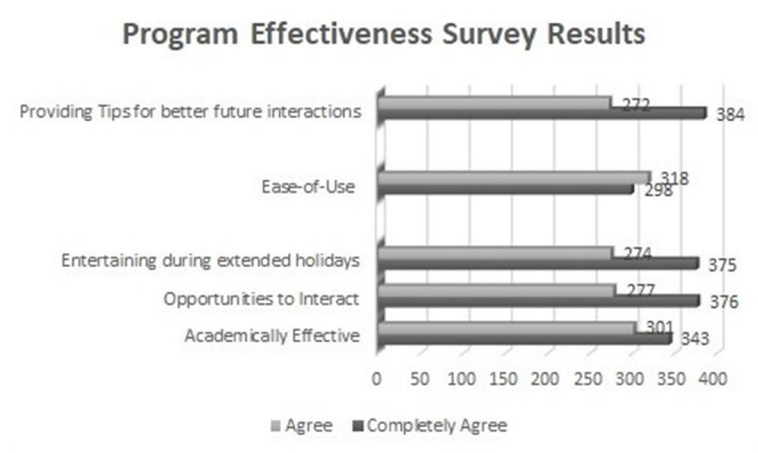

Program Effectiveness Survey Results

- Providing Tips for better future interactions: 272 / 384
- Ease-of-Use: 318 / 298
- Entertaining during extended holidays: 274 / 375
- Opportunities to Interact: 277 / 376
- Academically Effective: 301 / 343

(x-axis: 0 50 100 150 200 250 300 350 400)

■ Agree   ■ Completely Agree

Table 1.

The online program's effectiveness as a tool for educating parents on how to better interact with their child received the highest percentage of agreement with 58 percent noting completely agree and 41.1 percent citing agree. Similarly, the program's practicality in creating opportunities for parent-child interaction was also highly praised by participants with 56.8 percent selecting complete agreement and 41.9 percent expressing agreement to the assertion that "the [program] material provides ample opportunities for engaging parent-child interactions". Ease-of-use was the category with the largest percentage of disagreement with 6.6 percent noting disagreement with the assertion that "following and applying the online learning program is easy for me."

3.6 Key Advantages. In the second portion, participants ranked prominent advantages based on their experiences with the school's online learning program. The possibility of individualized scheduling was perceived as the most advantageous aspect of the program. Ease-of-use was predominately ranked as the second key advantage with varied learning options and the self-paced nature of the program identified as the third and fourth advantageous aspects, respectively.

3.7 Common Complications. The survey listed possible complications in five main categories. The categories were: Behavior Issues, Confusing Materials and Instructions, Difficulty Concentrating, Lack of Supplies and Physical Fatigue. The most frequently noted difficulty was a lack of supplies (60.3 percent). 48.1 percent of participants noted "getting my child to behave properly is difficult" as a prime complication. The third dominate complication was difficulty concentrating which was selected by 45.9 percent of participants. It is noteworthy that confusing material and instruction was

the least noted complication with only 24.9 percent noting this as a challenge.

3.8 Preferred Content Area. The content of the program was categorized into 1- songs and chants, 2- books 3- crafts and experiments 4- videos of teachers modeling a task and 5-videos of students and their work. The most enjoyable content area was found to be crafts and experiments (26.3 percent). Books were noted the least enjoyable item, 6.8 percent. The following chart shows the distribution of interest among various content areas.

3.9 Interest in Continued Use. The survey found that a striking majority of participants, 93.7 percent, would like to continue the online learning program if continued after schools reopened.

4. DISCUSSION

The findings of this study on one online learning program created for preschool aged children is by no means all-inclusive. The effectiveness, benefits and challenges of online learning, for any age group, is "a story that is still being written, and how it progresses will likely depend on those present" (Nguyen, 2015, p.316). This empirical research and its findings do, however, offer insight into one school's endeavor into online early education. The survey of 753 parents revealed six key findings that can be applicable in further online programs and are inviting of future study.

4.1 Acceptability and Potential. Firstly, the belief that "adult students benefit more from taking online classes compared to traditional age students" (Boghikian-Whitby & Mortagy, 2008, p.107) has been dismissed. Preschool aged learners can in fact benefit from online learning environments if properly designed and catered to their needs. The widespread acceptance of the online program at the kindergarten, 87.8 percent, is telling of the fact that parents and students are ready for the inclusion of online learning in earlier age groups. The next stage after established acceptability must be to identify strengths and weakness and build upon them. Understanding the aspects of a course that increase students' understanding and participation can aid instructors and course designers (Gilbert, 2015). Moreover, the findings show hands-on activities as being the most preferred activity among users. This indicates an area for future development. Online learning does not create a barrier for interaction, which is vital for early development, rather "online learning environments allow for learning to occur in a setting that is not restricted by place or time" (Gilbert, 2015, p.28).

4.2 Practicality. The survey results proved the program to be effective in all five areas. The area which received the greatest number of 'completely agree' responses and zero 'completely disagree' responses was related to 'Providing Tips for Better Future Interaction.' This is highly significant for it identifies a key scope in early education online learning; one that does not only support the learner but actually enables the caregiver to better assist the learner. Evidently, the opportunities for parent-child interaction that the program created were effective in fostering a better parent-child relationship. To foster this important healthy relationship, warmth and structure are the two most powerful tools (Guide to Building, 2015). Furthermore, a secure bond of attachment between children and their parents has been noted to foster mental, social and psychological health (O'Connor & Scott, 2007). More specifically, Gardner (1989) notes that a healthy the parent-child relationship is an essential way of enhancing children's positive behavior which will make interactions more pleasurable for parents as well as better children's interactions with one another. Online early education could despite common fears of technology leading to separation become a method for increased family time and aid the formation of positive, focused and consistent parent-child interactions.
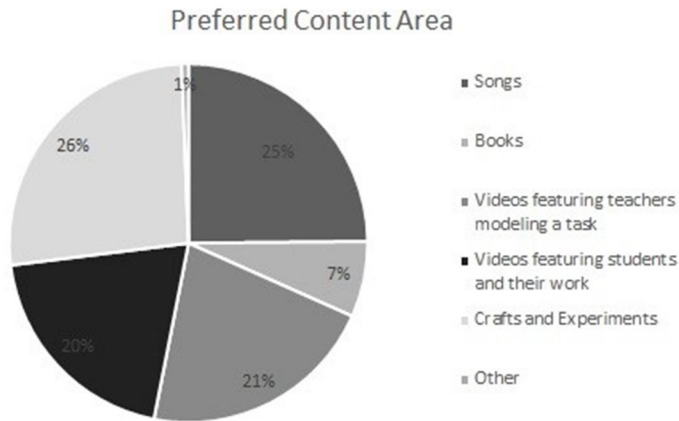
4.3 Advantages. The findings of the survey indicated that the same benefits noted in adult online learning courses prove beneficial in online early education as well. Individualized scheduling was the most advantageous point for parents. It can be hypothesized that this feature enabled the positive parent-child interactions for students did not have be simultaneously logged on, there were no deadlines and each daily program could be accessed on any given day.

In sum, the program offered flexibility and the freedom to learn anytime. Flexible nature enables personalized pacing of students' learning thus allowing difficult concepts to be reviewed as often as necessary and enables learners to engage in content using their own initiatives. The same benefits seen here are noted by the Department of Education which notes that distance learning is enabling learning beyond the classroom walls [and]. . . equipping learners with contemporary skills necessary for successful participation in life" (U.S. Department of Education, 2010).

4.4 Challenges. The survey findings revealed lack of supplies as the most cited challenge with the program. Children misbehaving and lack of concentration were the second and third common challenges. These conclusions are bilaterally informative. Firstly, early educators and course designers for early education must be mindful of the practical nature of preschool learning. Thus, tasks should include none specialized, easily-available supplies. It is noteworthy that the daily programs were available for viewing without time restrictions therefore, parents could actually skip a task and return to complete it once supplies had been purchased.

The second, and arguably more important, implication of this finding was that the program itself was not cited as a challenge. It was noted to be easy-to-use, with clear tasks and instructions. Overall, no educational program or platform can claim to be flawless. Online learning platforms, and the program under study, are thus no exception. The challenges in relation to supplies and student behavior must be dealt with. However, the content and form of the program can be viewed as positive examples of an effective online early education program as we collectively learn from the positive and negative experiences of distance learning.

4.5 Preferred Content Area. The findings indicated crafts and experiments, which are practical activities, to be the children's most enjoyable content area. Through a hands-on approach "students are able to engage in real life illustrations and observe the effects of changes in different variables" (Ekwueme et al., 2015, p.47). This finding is reaffirming the understanding that providing learners the opportunity to manipulate objects, or hands-on learning, will enhance their ability to think critically. What is remarkable, however, is that we can offer hands-on learning through none traditional platforms. By posing engaging questions, including clear instructions, adding instructional images or videos and offering ample opportunities for discovery, thinking, analysis and material manipulation, we can foster intuitive early childhood learning through a distance learning program.

Preferred Content Area

- Songs
- Books
- Videos featuring teachers modeling a task
- Videos featuring students and their work
- Crafts and Experiments
- Other

5. CONCLUSION

The unexpected closure of schools resulted from the COVID-19 outbreak has led to fear, confusion, and change. Change, conversely, can be a powerful motivator of innovation. This study examined one kindergarten's innovative approach to change and how online early education can be possible. The findings of the 753-participant survey indicated widespread acceptance, dominate practicality, numerous advantages and some complications from which we can learn. The study has certain limitations as well. Firstly, the scope, involving one program, is too narrow. Certainly, there are numerous programs around the globe worthy of study which can complement the current findings. Another limitation of this study is the lack of interviews
with the participants which would offer greater insight into their views. It is noteworthy that interviews were not included in the research design to maintain the anonymity of participants and increase data reliability.

The realm of online learning programs for preschool aged children is yet to take shape therefore there exists abundant venues for future study. Studies that follow this format can be conducted around the world leading to an increase in the understanding of online early education. When designed and executed properly, online programs can become valuable tools in fostering healthy parent-child relationships. As our global knowledge increases, we grow as educators and instructional designers. It is from this sharing, analysis and growth that our learners' benefit. Ultimately, we can learn to create effective online learning programs for preschool aged children that aptly meet their needs and prepare them for lifelong success, hopefully, without the backdrop of a global pandemic.

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