An Action Research on Parent-Child Shared Digital Education Platform for Japanese Working Parents

Ma, Jiani
Keio University, Japan
Graduate School of Media Design

Ms. Jiani Ma
Graduate School of Media Design
Keio University, Japan.

An Action Research on Parent-Child Shared Digital Education Platform for Japanese Working Parents

Synopsis:

In recent years many parents begin to adopt the use of digital media, such as mobile learning software, as a substitute to their parenting tasks. However, as this type of parenting and pre-elementary learning in the digital age becomes more pervasive, it's necessary to rethink the role of digital media in parents' and children's life: how to use digital technology to support parenting to accommodate busy modern life style and promote parental involvement in pre-elementary education. This research presents an action research of the digital parenting platform for improving work-life balance for parents in parent-child interaction, supporting parents-children activities in pre-elementary education, providing the procedures and supporting requirements of parenting and learning in the digital age.

AN ACTION RESEARCH ON PARENT-CHILD SHARED DIGITAL EDUCATION PLATFORM

FOR JAPANESE WORKING PARENTS

Jiani Ma

Graduate School of Media Design, Keio University
Tokyo, Japan

ABSTRACT

In recent years many parents begin to adopt the use of digital media, such as mobile learning software, as a substitute to their parenting tasks. However, as this type of parenting and pre-elementary learning in the digital age becomes more pervasive, it's necessary to rethink the role of digital media in parents' and children's life: how to use digital technology to support parenting to accommodate busy modern life style and promote parental involvement in pre-elementary education. This research presents an action research of the digital parenting platform for improving work-life balance for parents in parent-child interaction, supporting parents-children activities in pre-elementary education, providing the procedures and supporting requirements of parenting and learning in the digital age.

Author Keywords

parental involvement, digital media, parenting, Japan, working mother, pre-elementary, action research.

INTRODUCTION

Many previous studies have shown that parental involvement is good and necessary. But in our busy modern life, being involved might seem intrusive and difficult to fit into many parents' already busy lives. In Japan, the busy life style and limited free time create greater pressure for parents to their parenting. Especially working mothers, the reduced time that working mothers spend at home with their children due to work hours becomes a tradeoff. In a society where the tasks of parenting and early childhood education are mainly expected as mothers' responsibilities, as a result Japanese working mothers face challenges to become fully involvement in the parenting and learning process of their children. To overcome this issue, many outsource the parenting tasks hoping their children would receive the best of care and teaching. In digital age, some parents turn to for outsourcing their parenting tasks is digital technology. The advancement of digital media devices and digital interactive contents has created a popular tool for parenting and education. Many children are fascinated by the interactivity and fun experience of operating digital devices and their constant focus on the digital devices and contents give parents the freedom to relax or conduct other activities.

Some parents feel that digital devices are very useful. They feel digital media offer great potentials to make parenting easier, because there are many activities to keep their children occupied and entertained while learning new things. On the other hand, parents worry that children will get bad influence if they spend so much time on these devices. And also some parents worry about how to teach their children when using digital media [4].

In digital age, it means parents have to face the dilemma of digital media on childhood parenting. The current focus of digital parenting and learning mainly centers of providing children rich and entertaining learning materials, which does not directly help busy life parents in improving their involvement in providing their children parenting and pre-elementary school learning. However, as a tool that is enjoyed by children, and can easily be used daily by parents, digital media may offer great potentials in supporting parents to become more involved in parenting efficiently with their busy schedule and lifestyle.

This research looks into how digital media can be used to promote parental involvement in children parenting and pre-elementary education, in addition to being a learning tool used by children. The research is conducted using action research (AR) approach through cyclical process of field work, ideation, design and qualitative user evaluation to create a mother-child shared interactive parenting platform that supports working mothers' involvement in the pre-elementary education and parenting of their children.

LITERATURE REVIEW

This section explores the value of the proposed shared pre-elementary parenting platform for parents by reviewing related and previous researches in various fields.

Parental Involvement

Although modern lives are getting busy and outsourced parenting services are getting more and more convenient, parents are still major character in children's parenting. There are strong evidences suggesting that parental involvement is beneficial in early childhood education.

The Harvard Family Research Project defines educational involvement of families as activities that parents conduct at

home and in early childhood settings to directly or indirectly support their child's learning. Involvement at the preschool level has a number of lifelong benefits, such as establishing the importance of education and developing a network of helpful connections [6]. Parental involvement at this critical point provides the children with a springboard that makes the move to elementary school in a more tranquil transition.

Moreover, a research investigated how the 'family social capital' – communication, good parental relationships and participation with the child's school life, fared against the 'school social capital' – the upbeat attitudes of teachers and their extra- curricular input, as well as the ability of the school to provide a positive environment. It was discovered that children who came from higher ranking family capitals but lower school capitals, on average showed better academic achievement than those with high school capitals but low family capitals. While both the school and family environments are significant to a child's academic success, the study shows that extra parental support and help can make a difference to children's academic performance [3].

Meanwhile, a study conducted by Japan's Ministry of Education, Science and Culture examined the decrease of parental involvement in today's Japanese early childhood education. The increased economic pressure has forced both parents to work, and the competitive corporate environment of modern lifestyle have motivated parents to work harder and spend less parental time. While the increase of nuclear family means support child parenting and nurturing from extended family is becoming less [8]. These factors all contributed to an increased stress in parenting especially for mothers, leading to other issues including child abuse and even declining birth rate.

Parenting has become a market in which the role of parents is outsourced to preschool classes and day care centers whilst parents serve capitalist markets. To parents and supporters, the preschool classes are a handy way for busy, often affluent parents to instill important values in their children's lives. But some experts questioned hiring professionals to impart basic skills. Maehara suggests that outsourced parenting is not a good thing, and that unnecessary support for parents should be avoided. Every special moment in parenthood should be cherished as much as possible [9]. However, the reality is that without support for parents, some are unable to continue their demanding careers.

Parenting in Digital Age

The emerging digital mobile technology of the twenty-first century give today's children and parents much earlier and frequent exposure to computerized media devices than before. As noted previously, the involvement of parents in children's childhood learning and parenting is shown to have positive influence. And in digital age it is become more and more important. Parental mediation theory, a theory of active parent involvement in the full array of children's media experiences. As with so many other mass communication theories, it has had to consider the emergent strategy of participatory learning that involves parents and children interacting together with and through media [2]. Lynn Schofield Clark also suggests future research needs to consider how parents and children participate together in collaborative learning within emergent digital environments. In digital era both parental mediation and parent-child interaction are important, but new strategies of exploration are needed that take into consideration the fact that digital technologies have changed the way parents do their jobs.

However, effective parenting of children has never been easy, and the advent of the digital age presents parents with a novel set of challenges. For many parents, using digital device just like speaking a foreign language badly, it is not an easy thing. Bob Lotter pointed out the knowledge gap between children and adults is widening. Today's modern smart phone is an incredibly powerful device, capable of processing more data than a room full of computers processed twenty years ago [7]. It is not uncommon to see a three or four year old child pick up a tablet and begin swiping at the screen. If parents are lack of knowledge and experience in digital media use, they will not take responsibility to be actively involved in parenting in digital age. Moreover, in a study conducted by UNESCO note that parents often rightfully fear they will not be able to help their children in the area of ICT; they will fail to protect their children from potential threats and will not understand why and how their children are using digital media [12]. As a matter of fact, in the digital world, most of the parents are different from their children. They are neither digital natives nor masters of digital technology. There are prerequisites to closing the technology gap. Not just children, we also should pay attention to how to help parents reduce stress and enhance parental motivations in parental involvement.

Digital Parenting Design and Development

In digital age, there are many digital parenting applications and contents for parents and children. Among the previous studies on digital parenting design, there are some studies which show the criteria of digital parenting and education applications. The most important criteria are: 1. Adapt to your audience 2. Keep it simple 3. Use characters, setting and situations familiar to children 4. Speak and interact directly with children 5. Stimulate joint media engagement 6. Put children into action [10]. And Barseghian points out that most educational games and contents focus on the "Who?", "What?", "When?", and "Where?" while the questions coming from young kids are more of the "How?" and "Why?" variety. The common fundamental problem of digital parenting tools and contents is that we are answering questions that kids are not asking (Who?, What?, When?, Where?) instead of giving them tools to experiment, build on, and share their own ideas [1]. A good digital parenting

tool is not replacing parents with software or hardware. It should be help parents, engage children and support parent-child interaction.

To summarize the vision of most critics, much of the literature about digital parenting tools development and contents design is not about parent's role in the activity of parent-child interaction. This is different from designing a game that always relies on parents' input to continue, which may lead parents to abandon the game. Instead, the focus should be to make the platform useful, fun and engaging for both children and parents.

In the age of digital media, both parents and children are like digital tourists. As a tourist, they are learning the landscape. Digital parenting is challenging and difficult at first, but if parents actively involved in this process, they will head in the right direction with their children.

RESEARCH

DEPI is a digital educational platform to support working mothers in becoming more involved in their children" learning activities, while also reducing their stresses and anxiety related to their children" pre-elementary education. It explores new opportunities to support Japanese working mothers through the development of education applications aimed specifically at their needs.

Research Field

This action research is conducted in collaboration with a major preschool education provider group in Japan. Due to the private nature of this collaboration as part of the group's business strategy assessment, the name of the group shall remain confidential and will be referred to as S-school. The scope of this research focuses on working with S-school to develop digital media support in improving parental involvement at home for a group of its client working mothers whose children (four to six years old) attend pre-elementary programs.

Fieldwork Findings

The digital educational platform, DEPI is designed based on ethnography research method, fieldwork, thick description, and five models of contextual design. The field study includes informal interviews, and direct observations. Based on the field study, this research highlighted working mothers' difficulties toward children's pre-elementary education. The following are characteristics observed from Japanese working mothers' parenting.

- Stresses and strains surrounding pre-elementary education.
- Lack of knowledge of pedagogy.
- Limited working mother-child communication.

From the fieldwork study, this research focus on several design goals to promote reasonable, effective parental involvement for S-School to support Japanese working mothers in pre-elementary children activities:

- Reduce working mothers" stress and anxiety related to pre-elementary education.
- Improve parents' pedagogy skills to increase their ability to teach their children.
- Increase mother-child communication by using shared platform.

Concept

In order to develop the support for working mothers of S-school to achieve the design goals, DEPI (Digital Effective Parental Involvement) project was set up. It aims to designs a digital application that supports Japanese working mothers' needs through a cyclical design and evaluation process. The concept is inspired by the Gordon Model to promote listening, talking and discussing by facilitating working mothers to take the roles of a leader and a partner in their children's digital learning process [5]. This platform should help working mothers in providing oversight of digital education process; engaging in digital education process and tasks together with children; responding to children's digital education performance; engaging in meta strategies designed to create a fit between task demands and children's skill levels; engaging in interactive processes to support children's understanding of digital education and engaging in meta strategies designed to help children learn process conductive to achievement. To realize these digitally, this platform is designed to provide two sets of user features each for the mother and her child, and provide an efficient channel for mother user to deliver learning materials, review children's achievement, guide parental involvement, and enhance children's motivation for pre-elementary learning through a leadership and partnership role.

This research will document in detail the field study, the design process and the evaluation of user study results of this digital education platform. The main objectives of the research are shown as below:

- To evaluate that DEPI platform can support Japanese working mothers of S-School in their children" pre-elementary and reduce working mothers" stress, anxiety related to pre-elementary education.
- To verify that digital education platform is an essential part of mother-child communication in pre-elementary education.
- To understand parenting in the digital age and how the digital system can be redesigned for a more appropriate platform for parents and children.

Research Approach

This study is conducted using action research approach (AR) through cyclical process of field work, ideation,

design and qualitative user evaluation to create a mother-child shared interactive educational platform that supports S-School working mothers' involvement in the preschool education and parenting of their children. AR involves all the elements, brings together action and reflection, theory and practice that can support the can support the participatory enquiry and community. AR is cyclic by its nature: first round of observations, reflection, planning and acting is followed by second round, third round etc. This approach ensures that function and content is developed together with educators, parents, children, artists and software developers. The design and development philosophy ensures that educational digital platform DEPI and its content utilizes engaging learning techniques and considered appropriate by parents and fun by children.

Phase I - incorporating and designing mother's role

It is important to take the parent's role into consideration during the design process. Making the parent's role explicit in the application helps the parent recognize and play their part in the activity as a collaborator instead of a monitor. For example, if we are to design a digital education activity for mothers and their young children, the design needs to attract both young children and their mothers. This will help keep mothers a part of the activity, as opposed to leaving the education application to their children to play which leads to a lack of parent-child interaction.

Based on findings from the literature review and fieldwork study, the first design phase is conducted to test early design ideas and learn a general preferences from working mothers of S-School. There are two stages in this phase: paper prototype and digital prototype (Figure 1). They were consulted and tested with users to get feedbacks on their functionalities and designs.

Figure 1 Digital prototype UI design

Phase II - developing children's independent learning and creative ability

In pre-elementary years, it is important to offer children opportunities to take independent role in subtasks of the activity. Independence is an important element of childhood development and is perceived to offer many benefits in the short and long term [13]. Another important thing is "creativity" in young children. Every child can be considered to have creative potential and to be capable of creative expression [11]. In view of above-mentioned

consideration, the phase two focuses on children's learning contents in DEPI, which consists of three areas: learn, read and draw.

Phase III - facilitating mother-child interactions

The design of phase three focuses on a) providing S-School working mothers teaching guidance to improve their pedagogy skills; b) creating an efficient channel to deliver learning materials and review their children's performance and achievement; and c) involving mothers' involvement in children's pre-elementary education. The prototype consists of two different client applications: an application for mothers to manage learning materials and give these materials to their children; and another application for children complete the challenges of the day assigned by their mothers. Mother users can view their children's performance and achievement after the challenges are completed on the same device.

USER STUDY AND RESULTS
Phase One

From digital prototype use testing, the research found DEPI helped S-School working mothers to solve their inconvenience in children' pre-elementary education. It is easy to understand and use according the participants' subjective feedback. The discussion revealed several aspects that participants enjoyed:

·   All the mother participants agreed that they could get pedagogical guidance through this prototype. They agreed that the platform could help them better understand children' learning performance.

·   Eight out of ten participants reported that it's easily to use this prototype.

Phase Two

The second user study was conducted by contextual inquiry observations and interviews method with five children aged 4-6 years old and their mothers at S-School to understand children's tablet usage activities. The aim of the second user study was to learn whether the design could help children to form a friendly impression during using DEPI. In this phase, it was conducted by qualitative interview and observation method with five child participants. The interview was began by introducing DEPI briefly to the children and then let them use the prototype freely by themselves. Even though they asked question about how to use it, in general the observation showed that the UX design was easy to use by children. When asked about their impression and thoughts about using DEPI prototype two, children gave very positive feedback. All of them liked the design and four children replied that they loved to use DEPI to do homework with their mothers. Some children responded that they prefer to do "Print" in DEPI, because they feel they were playing, not just learning. Also, many participants responded that they like the drawing feature in

DEPI. It was observed that many saved their drawings and showed them to parents afterward.

From phase two prototype, this research found that DEPI digital education platform could help children experience various styles of learning activities, practice skills taught in kindergarten, prepare future curriculum, and become motivated in learning. All of the children showed that they would like to complete mother-created challenge by themselves. And they also showed great interest and fondness toward its visual design. The discussion revealed several aspects that participants were concerned about:

·   Not enough contents. Some mothers commented that there were not enough contents for children to learn and practice during the work period.

·   Difficulty setting. Some parents indicated it should be easier for children to solve puzzles that fit their child's needs. To solve this problem, I will provide a challenge recommendation mechanism that chooses suitable challenges for mothers according to their child's learning performance recorded in DEPI.

·   Countdown Timer. Six mothers suggested adding "countdown" timer function in children" learn pages.

·   Stamp. Four mothers and their children recommended "stamp" function. Because it will keep children motivated to learn and do well.

Phase Three

This study is conducted in order to assess whether DEPI can support working mothers of S-School in becoming more involved in their children's pre-elementary education, while also reduce stressed and anxiety caused by education related tasks in their busy life.

The third user study aims to examine whether DEPI is able to increase mother-child communication and improve parents' pedagogy skills. The study was conducted in three stages through five months. At S-School twenty participants (ten children and ten parents) took part in the user study. The children are between four to six years old. This age group was chosen based on the psychosocial theory of children development and researches of pre-elementary for young kids. The literatures argue the importance for children to do pre-elementary learning. The participating mothers were between thirty to forty years old. There were eight working mothers and two housewives participated in the study and they were from different background. Therefore, they provided their perspectives as a parent without bias from any specific group. This user study is based on a multi-method evaluation including (1) contextual inquiry observations, (2) questionnaire, (3) interviews, (4) video observation and (5) application log analysis. In this phase, there are 3 design goals as follow (Table 1).

Design Goal	Function	Content
Reduce working mothers' stress and anxiety related to pre-elementary education.	●	-
Improve parents' pedagogy skills to increase their ability to teach their children.	-	●
Increase mother-child communication by using shared platform	●	●

Table 1 The correlation between design goals and function/content.

Function (mother side)

·   Lessened Preparation Workload

All participants have expressed that DEPI helped reducing the time and effort in the preparations of children's homework. They felt that being able to look for learning materials within the application and eliminating the need of photocopying worksheets gave them more time to interact with their children.

·   Anytime, Anywhere

All participants all agreed that the use of mobile tablet device helped reducing the physical burden of carrying books and worksheets. They found this to be especially helpful during weekends and long breaks when the families went on trips. They also felt that their schedule can become more flexible since children can conveniently start studying whenever they find free time.

·   Performance Review

80% participants expressed that being able to quickly view a summary of their children's performance on the application helped them feel better sense of involvement in the education process and understanding of their children.

Function (children side)

·   More Independence

70% participants (mothers) noticed that their children can study more independently with DEPI because there is less reliance on parents to organize and setup paper-based materials.

·   Revisiting Problems

80% participants (children) particularly liked the function to easily mark troubled study questions and allow quick revisit and review in later time.

·   Sense of Time

All participants (parents and children) liked the timer function because it helps children to get a sense of time while working on the practice materials.

- Stamp of Motivation

The observation found that all child participants are motivated by the desire to continue their daily completion stamp streak, and continued to show high level of enthusiasm in working on the study materials throughout the span of the test.

- Pleasure of Use

All child participants expressed that the colorful and cute graphics used in the UI/UX and content design made the study process a delightful experience.

Contents (mother side)

- Improved Parenting Skills and Knowledge

80% mother participants said that the included knowledge base materials of parenting advices helped them to improve their parenting practice and gain new knowledge.

- Real World Interaction

All mother participants felt the contents about getting hands-on experience with natural objects such as fruits and vegetables were very refreshing and enjoyable. And in practice they also feel a closer relationship with their children.

Contents (children side)

- Improved Understanding

Some child participants said the audio and video contents helped them to better understand teachings such as physical exercises, making art crafts, storytelling, etc.

- Edutainment

Child participants generally showed high level of enthusiasm toward using DEPI for learning due to its mixed materials of pre-elementary school study materials and game-like entertainment contents.

Other findings

- Set rule for digital media use

Before use study, some of mothers were worried about how to guide their children to use digital media. But after a series of user study, they found setting boundaries can improve parent-child involvement and also develop good habits for their children.

- Be a model for child

For some mothers, it is the first time to use digital media tools such as iPad in children's parenting. They enjoyed digital media tools with children very much, on the other hand, they found children learn from parent behaviors even some bad behaviors. "When my child saw I kept my iPad on the table to check news during a meal, he said it is a normal behavior because mom did the same thing."- Participant 8 (female, age 30)

- Attract other family members' involvement

Although this user study was carried out among mothers and children, based on the interviews and observations, the involvement from fathers also deserved attention. Some mothers said their husband like digital technology tools then they actively joined in and showed they are interested by using digital parenting platform.

CONCLUSIONS

In this research, it targeted at working mothers and their pre-elementary children were carried out in order to support working mothers in becoming more involvement in their children's pre-elementary education, while also reduce stressed and anxiety caused by education related tasks in their busy life. The user study and analysis of the results has shown that, first, a good digital parenting media should consider parents situation, helping them to reduce stress and anxiety related to children's education. Parental involvement should not become pressure to parents. A good digital parenting media engages children as well as parents. Secondly, children were generally very eager to use the digital media device and contents. A good digital parenting media should be interactive and intuitive. It should combine education with entertainment and put children into real world interaction. Thirdly, parent-child shared digital parenting platform can promote parental involvement. It can lead to interesting conversations between parent and child, can boost language development, and can lead to healthy attitude about media and technology. Finally, parents play an important role in influencing children's appropriate digital media use, positive outcomes on digital parenting resulted only with appropriate parental mediation and modeling.

This research discussed digital parenting platform design and provided a practical plan, a digital parenting tool and a series of user study for evaluating, using, and integrating educational technology in early childhood parenting and learning. The work presented in this research is meant to serve as an exploration to the possibilities of improving working mothers' parenting skill through the use of digital technology. With further research and development, there is hope to discover more ways in which digital technology can improve work-life balance support for busy modern life parents in parent-child interactions. This work also aims to contribute to provide the procedures and supporting requirements of parenting and learning in the digital age.

In the future studies, based on previous user study, digital parenting platform DEPI will continue to improve throughout development. It will be necessary to conduct an objective, quantitative analysis with a large sample size and with participants from diverse regions.

REFERENCES

1. Barseghian, Tina, Playing Tag or Digital Games? Why Not Both?, (http://blogs.kqed.org/mindshift/2011/04/how-playing-tag-and-digital-games-can-build-on-each-other/)(2011)

2. Clark Lynn Schofield, Parental Mediation Theory for the Digital Age, Communication Theory 21(2011) 323-343 International Communication Association

3. Dufura, Mikaela J., Parcelb, Toby L. and Troutmanc ,Kelly P., Does capital at home matter more than capital at school?: Social capital effects on academic achievement, Elsevier Ltd (2013)

4. Goto, Noriko, "Study on Use of Media by Preschool Children and Parents", Benesse Educational Research and Development Institute (http://berd.benesse.jp/jisedaiken/research/research_25/pdf/research25_pre.pdf) (2013)

5. Gordon Thomas, "Origins of the Gordon Model", (http://www.gordontraining.com/thomas-gordon/origins-of-the-gordon-model/)

6. Lin, Qiuyun, Parent Involvement and Early Literacy, Harvard Family Research Project's (HFRP),(2013)

7. Lotter, Bob, Parenting in a digital age , ITProPortal.com < http://www.itproportal.com/2015/03/28/parenting-in-digital-age/>(2015)

8. Ministry of Education, Culture, Sports, Science and Technology, "The Changing Surrounding Environment of Children and Future Direction of Preschool Education".

9. Mehara, Hiroshi, "Risks of Child-rearing Support – Can We Prevent Mass Outsourcing?" Soseisha, June, 10 (2008).

10. O'Hare, Emma, Mobile apps for children. Commissioned by Cinekid (2014).

11. Runco, M.A. 'Education for creative potential', Scandinavian Journal of Educational Research, 47, 3, 317–24.(2003)

12. UNESCO Institude for Information Technologies in Education, Recognizing the potential of ICT in early childhood education, (2010)

13. White, R. W. Motivation reconsidered: The concept of competence. Psychol Rev 66 , 297–333.(1959)