

The Opinions and Perceptions of K1-3 Parents in Relation to BYOD Implementation in Japanese Kindergartens

Jeremy White^{1*}

¹College of Information Science and Engineering, Ritsumeikan University, Japan

*Corresponding author's email: jwhite@fc.ritsumei.ac.jp

DOI: <https://doi.org/10.54855/ijte2202011>

Received: 17/10/2021

Revision: 25/11/2021

Accepted: 30/11/2021

Online: 11/12/2021

ABSTRACT

Bring Your Own Device (BYOD) is a concept that is gaining a following worldwide as a cost-effective means for schools to provide 21st-century skills (Bell, 2010) with limited funding. The current paper shows the results of a survey into the opinions and perceptions of parents of Japanese K1-3 students' use of technology, specifically the application of BYOD at this level. This survey was conducted at a private kindergarten in Japan and was administered to 100 parents of K1-3 students. Results of this survey showed that even at this age, students have access to and use a variety of devices within the home environment under the guidance of parents. In addition, device time usage varied significantly by household, with some children allowed to use devices for over 90 minutes per day. However, when asked if they would accept BYOD at the K1-3 level, the answers were overwhelmingly negative. Thus, the results of this survey show that while BYOD was considered acceptable from the higher grades of elementary school, the idea of implementing a BYOD program at the K1-3 level is still a step too far for parents of kindergarten students in Japan.

Keywords: BYOD, 21st-century skills, K1-3, Japan

Introduction

Mobile devices have become synonymous in our modern-day society. It has been said for some time now that we have reached a mobile saturation of sorts, with those in developed countries such as Japan nearing 100% ownership status (Statista, 2020). In Japan, the third-biggest economy in the world, it is the new norm to see devices in every facet of daily life. In fact, many people wonder how they would survive without using their devices, even for just a day. However, when mobile device use in education is discussed, the arguments for and against the use of technology in education can at times be polarizing. The pedagogical landscape of Japan suggests a need to develop curricula focusing on 21st-century skills (Mills & Thanyawatpokin, 2020) for a generation of students commonly thought of as digital natives (Prensky, 2001). This

paper aims to look at the opinions and perceptions of parents in Japan concerning bringing your own device (BYOD). Uniquely, this study focuses on the K1-3 level of education, a relatively new field, to investigate if the parents of K1-3 students are willing and able to integrate BYOD into the children's lives. This paper will first outline recent literature in the area of BYOD for K1-3 students, focusing on parents' perceptions. The paper will then outline the results of a BYOD survey given to 100 parents at a K1-3 institution in Japan and show a clear divide between those who do and those who do not believe BYOD is necessary for their child's education. The results will also show that all parents, whether for or against BYOD, can see that at some level of it will become mandatory in the future.

Literature review

What is BYOD?

Bring your own device (BYOD) is a technological model in which students are asked to provide their own devices to support their formal learning (Alberta Education, 2012). Since BYOD programs began, those involved with education have been exploring ways in which BYOD can be integrated into students' lives both inside and outside the classroom to increase the effectiveness of learning (Song & Kong, 2017), provide 21st-century skills (Bell, 2010), and provide for the digital natives (Prensky, 2001) of today. White (2016) highlighted that the need for BYOD at schools has come about by the reduction in the budgets of educational institutions year after year. However, at the same time, the cost of providing adequate education using the latest technology is more expensive than it has ever been (Nippon.com, 2019). While the pedagogical landscape has become increasingly digital (Mills & Thanyawatpokin, 2020), educators have struggled to provide a curriculum that balances the best learning environment for students with the digital tools at their disposal. Educators face the additional pressure of living in a time when ICT technology skills are believed to be essential to prevent a gap between the education provided and needed of the student of today (Ackerman and Krupp, 2012). The reduction in budgets of educational institutions has meant that the emphasis on purchasing and maintaining high-cost technological items such as computers, computer software, and, more recently, tablets are being placed on the families without consideration for the household's socioeconomic status.

BYOD as a concept for education first began to gain traction in North America but is now commonplace throughout educational institutions worldwide. While some might believe that BYOD is the magic bullet modern-day education needs, literature to date has confirmed both positives and negatives of BYOD programs. As far back as 2010, Chiong and Shuler (2010) found resistance to the use of technology in education, stating that there is evidence that parents of young children were not willing to recognize the educational benefits of mobile devices. Although, they did allow children to use these devices in a home context. This may suggest that parents viewed the device as a home play activity rather than for use in a formal education setting. Sadykova et al. (2016) found more negative views when they conducted a case study

on a private multilingual kindergarten and preschools in Russia that used iPad tasks in a bid to enhance the language curriculum. In this case study, 12 students participated using Reading Eggs (<https://readingeggs.com.au/>), an online reading program to enhance children's reading ability, as a homework activity for 30 days under parental supervision. The study found that parents, in some cases, did not believe in the potential modern mobile applications could provide younger children with both their literacy skills and foreign language development. Literature also shows that parents were, in some cases, unwilling or unable to assist children when doing their iPad-based homework activities as they lacked both digital literacy skills and foreign language skills (O'Bannon & Thomas, 2014). Although highlighting negative perceptions, this study does show the need for BYOD at the K1-3 level. By using the devices within a formal educational institution, the students would have access to educational professionals with both digital literacy and foreign language skills to make the device usage more effective. Kay and Schellenberg (2017) found a deep seated view among educators that mobile devices in class can provide more of a distraction from learning than a positive influence with a similar negative point of view. Their study of 80 high school students reported that while there were advantages to BYOD for learning, both the teachers and students could see how having these devices in the classroom could be a distraction for learning.

BYOD in K1-3

This paper has a specific focus on K1-3 students and BYOD. Literature in this age group remains limited due to the newness of BYOD and the focus on implementing it at higher levels of education. Herodotou (2018) conducted a meta-analysis of 19 studies that reported the learning effects of touch screen devices such as tablets, iPads, and smartphones on young children five years old or younger and published after 2009. The author concluded that most of the studies focused on literacy, science, and math concerning the cognitive effects on younger children. Encouragingly for the future implementation of BYOD, the results of the studies were mainly positive. However, the author outlines a lack of research into children's social and emotional development and mobile devices' impact on this development. While beyond the scope of this paper, these are issues that need to be taken into consideration when attempting to implement a BYOD program.

Children are stimulated by technology outside of the classroom (Boyce, 2014), whether TV, the internet, or mobile devices. Nevertheless, when the same students enter the classroom environment, they are required to turn off their devices and, in many circumstances, return to a more traditional form of education. This powering down of students has been linked to a disinterest in education at a primary and secondary level, and it could be argued that kindergarten students also suffer from the same level of disengagement with their traditional classroom environment (Kopecký, 2021). The American Academy of Pediatrics (AAP) has set a guideline of one hour of bad screen time for children between the ages of two to five (KidsHealth, 2019). In addition, a recent study found that children who use screens for long periods have lower structural integrity between the connections found in white matter (Barret, 2019). Finding the balance between good and bad screen time is still something that needs

further investigation for those who want to implement BYOD programs. It is also likely to be a significant concern to parents when deciding on their opinions of such programs.

Before BYOD Implementation

From the above, we can see that careful planning needs to be considered before BYOD programs can be implemented. Ackerman and Krupp (2012) highlight five such areas.

1. Stakeholders. In BYOD, there are several stakeholders who are all highly invested in its success. Without the support of all stakeholders, the likelihood of success diminishes rapidly. The authors suggest that parents and teachers are the first stakeholders in any BYOD program. Both need to feel invested in the program, to be well informed, to be able to see the benefits of BYOD, and to have the ability to give feedback and state their opinions of the program without fear of reprisal. Stakeholders need regular indications about the effectiveness of their BYOD program, as, without this support, it might diminish. Students are also stakeholders in any BYOD program and require the same information as parents and teachers, especially in upper elementary, junior high, and high school levels. As with parents and teachers, the successful implementation of BYOD depends on the students being willing participants.

2. Security. This is arguably the most crucial consideration, especially for BYOD in education. The program needs to be monitored for both the security of the students and the school. Schools need to consider how using devices outside of the school's control fits in with their own security program, and in addition, they need to ensure the security of students using their own devices at school. With cyberbullying becoming more prominent in Japan (Udris, 2015), schools need to develop a clear no-tolerance policy to protect students.

3. Financial stability. While it may seem that BYOD is a budget-friendly option for technology implementation as students provide the devices, this is not always the case. Before and during BYOD, schools will need to invest in infrastructure such as high-speed and stable Wi-Fi, technical support, and funds for professional development of teachers who may not have the digital literacy skills or could possibly be resistant to the use of technology in the formal learning environment.

4. Professional development. As alluded to in (3), schools will need to conduct faculty development sessions. Outside institutions or more knowledgeable peers can run these. No matter how implemented, professional development will ensure that teachers can pass the skills onto students, enabling them to become autonomous learners.

5. Policies. An acceptable use policy (ACP) needs to be made between stakeholders before BYOD can be implemented. While the goal is to allow autonomous learning to enhance the students' experience, this should be done within the ACP created by all stakeholders.

Research Questions

BYOD is now understood as one of the ways of delivering effective state-of-the-art education to students, providing them with essential ICT skills, and helping them become autonomous learners. Due to more BYOD programs being offered at educational institutions worldwide, an

increase of BYOD literature-based studies of these programs is now available to help stakeholders understand what BYOD means. However, there is a gap in the literature to date, focusing predominantly on elementary school students and above. In addition, the current body of research is mainly concerned with the user (student) experience and success of the program, not with the perception of parents concerning the implementation and success of BYOD. The current study is unique in that the focus is on the K1-3 level, a relatively unexplored area. In addition to this, this study delves into parents' perceptions of K1-3 students rather than student experience. This is because, arguably, at the K1-3 level, the parent is the essential stakeholder in implementing a successful BYOD program.

The following research questions are addressed in the study:

1. What access do K1-3 students have to mobile devices that could be used for BYOD programs?
2. How often and when are K1-3 students using mobile devices in their daily lives?
3. What are the opinion and perceptions of the parents of K1-3 students in regard to the use of mobile devices and the implementation of BYOD programs?

Methods

This research project used a survey-based approach to collect data. The questions for the survey were modified from a previous BYOD survey conducted by White (2016) with Japanese elementary school students. The modifications were necessary to consider the advancement technology between the time of the initial and current survey and the differences in educational context between the elementary and kindergarten level. The statements for the survey were first taken from the original English versions, and once modified for K1-3 students was translated into Japanese (see appendix 1). The survey was then cross-referenced with the original 2016 survey to ensure that language in the modified version was a close match to the original. This was done to compare the results of both the previous survey and the current study. The survey was piloted by three parents of kindergarten-aged children with minor adjustments made for clarity based on the feedback received from these parents. The survey was distributed to 100 parents at a private Japanese kindergarten in western Japan with the permission of the kindergarten administration. The survey was given in the paper form, and parents were asked to complete it voluntarily over two weeks. The researcher decided to conduct a paper-based survey as responses were likely to be higher. Survey boxes were placed outside each classroom in the kindergarten to collect the completed surveys. This method was chosen to reduce the feeling of obligation some parents might feel if they were required to give completed responses directly to the teachers at the kindergarten. After the two-week collection period, 83 responses were received. This represented close to 90% of the parents at the kindergarten, as some families had two or three children enrolled and submitted a single survey for all of their children. After reviewing the responses, 74 of the 83 were considered to be statistically significant.

Results/Findings and discussion

The first section of the survey asked the participants about the age of their children currently in kindergarten. As shown in Table 1, there were significantly more five-year-old students than the other age groups, with four-year-old being the second highest. Overall, there were slightly more male students than females, which is consistent with the demographics of the kindergarten in general. This question also shows the number of families with multiple children enrolled in the kindergarten and highlights that the 83-person response rate of this survey is exceptionally high given that only approximately 100 students were enrolled at the time the survey was taken.

Table 1

Participant information

	Three	Four	Five	Six	Total Number	Male	Female
Age of 1st child	12	16	30	16	74	36	38
Age of 2nd child	1	6	1	1	9	7	2
Age of 3rd child	0	1	0	0	1	0	1

The following section asked how many devices the kindergarten-aged students had access to in the house. Smartphones and iPhones made up the majority of the devices, with 168 devices in total. This confirms the current statistics concerning the saturation of mobile devices (Statista, 2020). As there are numerous models of iPhones, iPads, and smartphones that all provide similar functions, respondents were not asked to make a distinction between the models. It should be noted that this question refers to the number of devices a K1-3 child has access to, meaning the device does not need to belong to or be exclusively used by the child referred to in the survey. Given the age of the children and a large number of iPhones, iPads, and smartphones, it can be assumed that these devices do not belong to or were not for exclusive use by the child indicated in the survey. A presumption has been made that these devices belong to an adult or older sibling within the family and are shared by all family members.

Table 2

Number of devices kindergarten student has access to in the house

Total number of devices	Number
Nintendo DS	16
Nintendo 3DS	21
Portable PlayStation	8
iPhone	34
iPad	16
Smartphone (any model)	42
Tablet (any model)	17
Other	14
Total	168

The next section asked which device the child most often used. The results of this demonstrated that K1-3 students mainly used iPads, smartphones, and iPhones. This may suggest that parents of K1-3 students do not allow their children to use gaming-specific devices, or it could indicate that iPads, smartphones, and iPhones are more appealing to K1-3 students. In addition, the variety of the content available on iPads, smartphones, and iPhones, which includes both entertainment games and educational content, may be more appealing to parents compared to gaming consoles. This is because iPads, smartphones, and iPhones can be considered educational (Murkoff, 2019) and benefit their children's cognitive development, whereas gaming consoles are not.

Table 3

Device used most frequently by kindergarten-aged child

Which device does your child most often use?					
iPad	18	3DS	6	PSP	1
SF	17	DS	1	Gamepad	1
iPhone	14	Wii	3	WiiU	1

The next section aimed to discover how long K 1-3 children were using technology per usage. The answers provided some surprising results. Forty of the seventy-four respondents (54%) let their child use a device for between zero - 30 minutes, with 21 (28%) of those in this group allowing usage for between 21 - 30 minutes. This was the most common answer regarding device usage per time based on frequency. Unfortunately, the reason for this was not asked as part of the survey. However, informal conversations with some of the parents indicated that they based this on a feeling that this was the correct amount of time and not any specific guidelines. Although the parents had no understanding of any medical guidelines concerning this, they generally believed that to use the device for longer would be detrimental to the child's health, especially to their eyes. Current research on the subject indicates that the intuition of these parents is indeed correct. The prolonged use of digital devices has been linked to various physiological and psychological conditions (Lissak, 2018), and current research suggests screen time of under one hour per day (Canadian Pediatric Society, 2017). At the other end of the spectrum, three (4%) of the respondents indicated that their child was allowed to use a device for over 90 minutes at a time, with a further four (5%) allowing device usage for between 61 - 90 minutes. This was surprising given the aforementioned informal conversations held with some parents about the health effects of overuse of devices and possibly demonstrated how in some instances, parents are using devices to entertain children as they are busy with other tasks. As no questions were asked about the amount of time spent watching television and doing physical activity, it is difficult to predict exactly what the parents in this upper range feel about these activities compared to technology usage.

Table 4**Length of technology use per usage**

How long does your kindergarten-aged child use technology per usage?	
No answer	12
0 - 10 minutes	15
11 - 20 minutes	4
21 - 30 minutes	21
31 - 40 minutes	3
41 - 50 minutes	4
51 - 60 minutes	8
61 - 90 minutes	4
91+ minutes	3
Total	74

The following section gives some clarity to the previous section. Firstly, 11 parents indicated that they do not let their children use technology. No justification was received for this. However, given the saturation of devices, it could be assumed that this was related to the parents' understanding of screen time health issues. Of the parents who allowed their child to use technology, the most frequent range was between one to five times a week, with three times the most frequent. At the other end of the spectrum, seven students were allowed to devices every day, and another six multiple times a day. The Japanese Pediatric association (2013) recommends less than two hours of digital activity per day. Thus, implementing a BYOD program at this age may cause some students to exceed their daily prescribed limits.

Table 5**Technology use per week**

How many times do your kindergarten-aged children use technology per week?	
Zero	11
One	12
Two	7
Three	13
Four	3
Five	11
Six	4
Seven	7
Seven +	6
Total	74

The following section was designed to gain an understanding of when K1-3 students use technology. The results here are generally what might be expected of K1-3 students who do not use technology in their formal education. There was little use of devices in the morning on weekdays, with most usage occurring in afternoons or evenings after kindergarten had finished. This is an expected result as most children have little time to use devices before kindergarten on weekdays. Weekend usage indicated that most K1-3 children used devices in the mornings and afternoons, with relatively little use in the evenings. This may indicate those weekend evenings are a specific time when children are involved with other activities or have designated family time.

Table 6

Technology use time of day

When does your kindergarten-aged child use technology?	Weekday	Weekend
Morning	7	29
Afternoon	28	38
Evening	30	15
Doesn't use	12	4

The next series of statements were specifically related to BYOD and were based on a seven-point Likert scale, from strongly disagree (1) to strongly agree (7). Although, as can be seen in the first statement, *I consciously monitor my child's technology use*, the general conclusion is that parents of K1-3 children do, in fact, monitor their use ($m = 5.38$). Given the child's age, the researcher assumed that the median would be nearer seven (strongly agree). This result follows current literature (Gallego, 2020), suggesting that a minority of parents are comfortable with their children using devices, even if the device has internet capabilities and the child is using it without parental supervision. The result demonstrates the need for greater parental education into effective ways to keep children safe when using devices. This result may also suggest that the majority of parents may not be comfortable with BYOD as they cannot monitor device usage themselves, but instead need to trust the teacher to monitor technology usage to the same level as would be done in the home environment. As was outlined in the literature review, this suggests a need to better inform the stakeholders (Ackerman & Krupp, 2012) about the safety aspects of the BYOD program.

The statement, *it is a good idea for parents to talk to their kids about acceptable online behavior*, had a median of 6 ($m = 6.06$). This result demonstrates that most parents are already discussing appropriate online behavior at the K1-3 age, which is also seen in the literature (Livingstone, 2015). When considering the implementation of BYOD at the K1-3 level, this result is encouraging, as the students would likely bring their device into the classroom with an understanding of the appropriate device use behavior expected, informed by one of the stakeholders. However, the standard of appropriate behavior would differ from household to household. Thus, the school would need to ensure their online behavior policy was enforced

within the school environment.

The next statement, *monitoring my child's technology use is a violation of their privacy*, demonstrated that most parents disagreed with this statement, $m = 2.60$. For the implementation of BYOD at K1-3, this is a significant result. Within the school environment, technology use would need to be monitored to ensure the student's safety. Without the understanding of the parents, the enforcement of this BYOD policy could not be successfully implemented. However, some respondents strongly agreed or agreed with the statement. This result was unexpected; however, it highlights that a proportion of parents place importance on their child's privacy, even at an age where they are dependent on their parents for almost every facet of their daily lives. As has been referred to, implementing a successful BYOD program at the K1-3 level can only occur when all stakeholders are fully informed and positive and negative opinions are shared. A failure to do this could risk the program's success by having a core set of dissatisfied stakeholders.

The final statement, *monitoring a child's technology use can help keep them safe*, received an $m = 5.79$. As with the previous statement, some respondents disagreed, which again focuses on fully informing parents about how monitoring technology usage can help keep a child safe from online dangers.

Table 7

Parental monitoring of technology use

	Median	Mode	SD	Variance
I consciously monitor my child's technology use.	5.38	6.00	1.01	1.01
It is a good idea for parents to talk to their kids about acceptable online behavior	6.06	6.00	0.79	0.62
Monitoring my child's technology use is a violation of their privacy	2.60	2.00	1.26	1.58
Monitoring a child's technology use can help keep them safe	5.79	6.00	1.01	1.02

The next set of statements was designed to discover when parents believed children should bring their device into formal education. As shown in Table 8, there is a clear pattern in which parents do not begin to answer positively until the third grade of elementary school ($m = 3.26$), approximately eight years of age. The answers are particularly negative in the K1 ($m=1.93$), K2 (2.00), and K3 (2.24), suggesting that parents of K1-3 students do not want BYOD at the kindergarten level even though the majority of parents allow some form of technology usage in the home. Whether this is related to the health issues, safety, or other issues outlined previously is unknown. However, there are some positives for implementing BYOD within formal schooling, with acceptance most likely from the third grade.

Table 8

BYOD implementation age

My child should bring their own device to school from...	Median	Mode	SD	Variance
Kindergarten 1 st grade	1.93	2.00	0.86	0.73
Kindergarten 2 nd grade	2.00	2.00	0.93	0.86
Kindergarten 3 rd grade	2.24	2.00	1.23	1.49
Elementary school 1 st grade	2.78	2.00	1.39	1.90
Elementary school 2 nd grade	2.88	2.00	1.41	1.98
Elementary school 3 rd grade	3.26	4.00	1.57	2.49
Elementary school 4 th grade	3.67	4.00	1.53	2.38
Elementary school 5 th grade	4.01	4.00	1.57	2.48
Elementary school 6 th grade	4.06	4.00	1.56	2.47

Further evidence to the above is provided by the answers to the following statements in Table 9. For the statement, *BYOD will become more important as my child gets older*. The median was 4.94, suggesting that parents believe that BYOD will become a part of education for children at some point in their education, but not until they become older and able to understand the responsibilities that come with BYOD. This may suggest that concerns relating to safety and security for parents outweigh health concerns. The answers to the statement, *parents should be consulted before implementing a BYOD program* were more optimistic ($m = 5.92$). This illustrates that as stakeholders', parents of K1-3 students feel that their inclusion in the decision-making process is justified. For schools, this is an important finding, as in previous examples of BYOD implementation, parents are often the last of the stakeholders to be informed. Disregarding parents in the BYOD decision-making process could lead to animosity between parents and the school, which could cause BYOD to be unsuccessful. The final statement, *Japanese schools, are ready to implement BYOD programs*, had a mean of 2.93. This result highlights the negative view of many of the parents of K1-3 students towards the Japanese education system and its ability to be ready to implement BYOD programs in the future. This again highlights the need for educational institutions in Japan to get all stakeholders involved in discussions about BYOD. Failure to do so will likely lead to a BYOD program that is a cause of animosity between stakeholders.

Table 9

BYOD appropriateness in education

	Median	mode	SD	Variance
BYOD will become more important as my child gets older	4.94	5.00	1.30	1.72
Parents should be consulted before the implementation of a BYOD program	5.92	6.00	1.21	1.45
Japanese schools (kindergartens/elementary) are ready to implement BYOD programs	2.93	4.00	1.18	1.39

Discussion

Looking at the survey results, there are some clear indications regarding the thinking of K1-3 parents, which will now be discussed in relation to the research questions.

1. What access do K1-3 students have to mobile devices that could be used for BYOD programs?

K1-3 students, in this survey, have access to a range of technological devices. The devices include gaming consoles, tablets, smartphones, and many of the devices had internet capabilities. This is in line with what is seen in Japanese society (Statista, 2020) and demonstrates that Japan is well placed to implement BYOD to provide the 21st-century skills (Mills & Thanyawatpokin, 2020) required of the digital natives of today (Prensky, 2001). However, this result only takes into consideration the number of devices and not how often the students are permitted access to them. This will be addressed in the second research question.

2. How often and when are K1-3 students using mobile devices in their daily lives?

From research question one, we can see that K1-3 students have access to multiple devices. However, the results of how often and when students can use these devices show us that there are some restrictions at this level that could influence BYOD implementation. Results showed that only a small proportion of the students were allowed to use a device daily. In addition to this, a significant number of students were not granted access to technology at all. While some of the students were able to use devices for 60 minutes or more per time, the most frequent amount of time for the device was between 20-30 minutes each time. Results indicated that weekday evenings and weekend mornings were the most common time for using devices. Given the restrictions some parents put on device use, this may suggest that students would have less access to their leisure time if a BYOD program was implemented at the K1-3 level. The reason for this will be discussed further in research question three.

3. What are the opinion and perceptions of the parents of K1-3 students in regard to the use of mobile devices and the implementation of BYOD programs?

Results from research question two showed that a significant number of parents restricted device use. These restrictions can be related to the time of use, time limits, and frequency. The literature suggests parents of K1-3 students are conscious of the health effects prolonged use of digital devices may have, such as physiological and psychological conditions (Lissak, 2018). In addition, parents may also be aware of the limits on screen time suggested for children of this age (Japanese Pediatric association, 2013; Canadian Pediatric Society, 2017). Results suggest that parents of K1-3 students are aware of the concept of BYOD and realize that it may be implemented in the future, particularly towards the upper grades of elementary school. Parents do seem to believe that BYOD is essential to their child's future and that mobile devices can be educational (Murkoff, 2019). However, the implementation of BYOD at the K1-3 level, based on this sample population, can not occur at present. It is clear that the stakeholders need to discuss security and safety if any BYOD program is to be used at this level and that parents, as key stakeholders, need a significant say in the direction of these programs. To disregard parents'

opinions will likely cause animosity towards the program, and support will likely not be given. This is a result found in White's (2016) study of BYOD at the elementary school level of Japan. Thus, parents at all educational levels in Japan feel the need to be involved in major BYOD decisions.

While the current study showed some favorable results for the future implementation of BYOD, some limitations should be addressed. The population for the survey consisted of one kindergarten with a limited population. To gain a deeper understanding of the topic, further surveys would need to be administered at a range of different kindergartens. In addition, the questions in the survey were all closed. To gain some valuable qualitative data, some open-ended questions should have been used.

Conclusion

BYOD is becoming increasingly common and understood in the educational world. More parents and educators realize the positives it can have on 21st-century skills and the negative of BYOD can bring to the formal classroom environment. This paper has delved into the parents' opinions of K1-3 students with BYOD implementation at the K1-3 level to see how parents allow technology to be used in their household, and whether those policies would transfer to the formal learning environment. Results from this study have shown that K1-3 students already have access to a variety of technology in their homes, but the amount and time of use vary significantly for each household. These variances are thought to be related to parents' understanding of health issues around device usage and not concerning a lack of available devices. Parents seem unwilling when asked about bringing devices into the formal learning environment. The data from the current study suggests that this may be related to health and security issues rather than being against the use of technology. The results showed that while K1-3 might be too early for implementing BYOD, parents agreed that BYOD would form a crucial role in their child's education in the future. Parents indicated that the most appropriate time to begin BYOD was from the 3rd grade of elementary school. One of the most critical findings from this research is the need for all stakeholders to become involved in the BYOD implementation decision-making process to ensure BYOD success.

References

- Ackerman, A., and Krupp, A (2012). Five components to consider for BYOT/BYOD, IADIS International Conference on cognition and exploratory learning in the digital age (CELDA 2012), 35-41. <https://files.eric.ed.gov/fulltext/ED542652.pdf>
- Alberta Education (2012). *Bring your own device: A guide for schools*. Alberta Education. <http://education.alberta.ca/admin/technology/research.aspx>
- Barrett, A. (2019, November 10th). *Excessive screen-time linked to changes in preschoolers' brains*. Science focus. <https://www.sciencefocus.com/the-human-body/excessive-screen->

time-linked-to-changes-in-preschoolers-brains/

- Boyce, C. J., Mishra, C., Halverson, K. L., & Thomas, A. K. (2014). Getting students outside: Using technology as a way to stimulate engagement. *Journal of Science Education and Technology*, 23(6), 815-826. <http://dx.doi.org/10.1007/s10956-014-9514-8>
- Canadian Paediatric Society, Digital Health Task Force, Ottawa, Ontario, Screen time and young children: Promoting health and development in a digital world, *Paediatrics & Child Health*, 22(8), December 2017, 461–468. <https://doi.org/10.1093/pch/pxx123>
- Chiong, C., & Shuler C. (2010). Learning: Is there an app for that? Investigations of young children's usage and learning with mobile devices and apps. New York: The Joan Ganz Cooney Center at Sesame Workshop.
<https://scirp.org/reference/ReferencesPapers.aspx?ReferenceID=866199>
- Gallego, F. A., Malamud, O., & Pop-Eleches, C. (2020). Parental monitoring and children's internet use: The role of information, control, and cues. *Journal of Public Economics*, 188, 104208. <http://dx.doi.org/10.1016/j.jpubeco.2020.104208>
- Herodotou, C. (2018). Young children and tablets: A systematic review of effects on learning and development. *Journal of Computer Assisted Learning*, 34(1), 1–9.
<http://dx.doi.org/10.1111/jcal.12220>
- Kay, R., & Schellenberg, D. (2017, June). Integrating a BYOD Program in High School English: Advantage or Distraction?. In *EdMedia+ Innovate Learning* (pp. 12-16). Association for the Advancement of Computing in Education (AACE).
- KidsHealth, (2019) Screen time guidelines for preschoolers, KidsHealth for Nemours.
<https://kidshealth.org/en/parents/screentime-preschool.html>
- Kopecký, K., Fernández-Martín, F. D., Sztokowski, R., Gómez-García, G., & Mikulcová, K. (2021). Behaviour of children and adolescents and the use of mobile phones in primary schools in the Czech Republic. *International Journal of Environmental Research and Public Health*, 18(16), 8352. <http://dx.doi.org/10.3390/ijerph18168352>
- Lissak, G. (2018). Adverse physiological and psychological effects of screen time on children and adolescents: Literature review and case study. *Environmental Research*, 164, 149-157. <http://dx.doi.org/10.1016/j.envres.2018.01.015>
- Livingstone, S., Mascheroni, G., Dreier, M., Chaudron, S., & Lagae, K. (2015). How parents of young children manage digital devices at home: The role of income, education and parental style. *Children and Society*, 1-12. <http://dx.doi.org/10.1111/chso.12020>
- Mainichi Shinbun. (2016). Lifestyle: Experts recommend limiting children's smartphone use
<https://mainichi.jp/english/articles/20161030/p2a/00m/0na/004000c>
- Murkoff, H. (2016). Kids and iPads: The Pros and Cons. *What to expect*.
<https://www.whattoexpect.com/toddler/ask-heidi/kids-and-ipads-the-pros-and-cons>

- Nippon (2019, August 16) *Cost of Education Soars in Japan While Wages Stand Still*, Nippon.com. <https://www.nippon.com/en/japan-data/h00522/cost-of-education-soars-in-japan-while-wages-stand-still.html>
- O'Bannon, B. W., & Thomas, K. (2014). Teacher perceptions of using mobile phones in the classroom: Age matters! *Computers and Education*, 74, 15-25. <http://dx.doi.org/10.1016/j.compedu.2014.01.006>
- Sadykova, G., Gimaletdinova, G., Khalitova, L., & Kayumova, A. (2016). Integrating mobile technologies into very young second language learners' curriculum. In S. Papadima-Sophocleous, L. Bradley & S. Thouëсны (Eds), *CALL communities and culture – short papers from EUROCALL 2016* (pp. 408-412). Research-publishing.net. <https://doi.org/10.14705/rpnet.2016.eurocall2016.597>
- Song, Y., Kong, S. (2017) Affordances and constraints of BYOD (Bring Your Own Device) for learning and teaching in higher education: Teachers' perspectives. *Internet and Higher Education*, 32, 39-46. <http://dx.doi.org/10.1016/j.iheduc.2016.08.004>
- Statista (2020) *Number of mobile phone users in Japan from 2013 to 2020*, Statista. <https://www.statista.com/statistics/274672/forecast-of-mobile-phone-users-in-japan/>
- Udris, R. (2015). Cyberbullying in Japan: An exploratory study. *International Journal of Cyber Society and Education*, 8(2), 59-80. <http://dx.doi.org/10.7903/ijcse.1382>
- White, J. (2016). The perceptions and opinions of parents of Japanese elementary school students regarding the concept of BYOT and BYOD in T. Cripps, *Perspectives on English Language Education in Japan*, 211- 234.

Biodata

Jeremy White is an associate professor in the College of Information Science and Engineering of Ritsumeikan University. He has master degrees in applied linguistics and education from Griffith University and is currently a Ph.D. candidate in the graduate school of Human and Environmental Studies at Kyoto University. Jeremy has published on a variety of subjects including game-jams, game-based learning, digital stories, computer assisted language learning, and mobile learning.

Appendix 1



Survey Regarding BYOD in Japanese Kindergartens

Hello, my name is Jeremy White. I am the father of [REDACTED] in Umi-gumi. I am also an Associate Professor at Ritsumeikan University. My research interest is the use of technology in the classroom. Raising a child, I have become interested in how kindergarten use technology. I have noticed the opinions of parents vary a lot, and I would like to get a better understanding of this issue. I would be grateful if you could out this survey. There is no correct or incorrect answer.

Please note:

All data collected will be kept private and only be used for research purposes. No identifiable data will be collected, and you will not be contacted for further research if you choose to take part.

If you have any questions about this survey, or would like to be informed of the results please contact me at: jwhite@fc.ritsumei.ac.jp

If you would like to know more about my research, please use the following QR code. Most of my research is in English.

I thank you in advance for your cooperation.

Regards,
Jeremy White
Associate Professor
College of Information Science and Engineering
Ritsumeikan University

BYOD Survey

**Please complete the survey below and return in the envelope
provided by _____**

① 幼稚園児のお子様の年齢と性別に○を書いて下さい。

	年齢 (歳)				性別	
	3	4	5	6	男子	女子
1人目	3	4	5	6	男子	女子
2人目	3	4	5	6	男子	女子
3人目	3	4	5	6	男子	女子
4人目	3	4	5	6	男子	女子

② お子様は下記のどの機器を使用していますか？当てはまるものすべてに☑してください。また、家庭内全部でいくつお持ちですか？該当する個数に○をして下さい。

	機器	個数 (個)					
		1	2	3	4	5	5以上
<input type="checkbox"/>	<input type="checkbox"/> Nintendo DS	1	2	3	4	5	5以上
<input type="checkbox"/>	<input type="checkbox"/> Nintendo 3DS	1	2	3	4	5	5以上
<input type="checkbox"/>	<input type="checkbox"/> Portable play station (PSP)	1	2	3	4	5	5以上
<input type="checkbox"/>	<input type="checkbox"/> iPhone (どのモデルでも)	1	2	3	4	5	5以上
<input type="checkbox"/>	<input type="checkbox"/> iPad (どのモデルでも)	1	2	3	4	5	5以上

②お子様は下記のどの機器を使用していますか？当てはまるものすべてに☑してください。また、家庭内全部でいくつお持ちですか？該当する個数に○をして下さい。

<input type="checkbox"/>	<input type="checkbox"/> スマートフォン (どのモデルでも)	1	2	3	4	5	5 以上
<input type="checkbox"/>	<input type="checkbox"/> タブレット (iPad以外のどのモデルでも)	1	2	3	4	5	5 以上
<input type="checkbox"/>	<input type="checkbox"/> その他 (機器名)	1	2	3	4	5	5 以上
<input type="checkbox"/>	<input type="checkbox"/> その他 (機器名)	1	2	3	4	5	5 以上

③お子様はどの機器を一番頻繁に使用しますか？当てはまる機器を○で囲ってください。

1 人目	Nintendo DS	Nintendo 3DS	Portable play station (PSP)	iPhone (どのモデルでも)	iPad (どのモデルでも)	スマートフォン (どのモデルでも)	タブレット (iPad以外のどのモデルでも)	その他 機器名
2 人目	Nintendo DS	Nintendo 3DS	Portable play station (PSP)	iPhone (どのモデルでも)	iPad (どのモデルでも)	スマートフォン (どのモデルでも)	タブレット (iPad以外のどのモデルでも)	その他 機器名
3 人目	Nintendo DS	Nintendo 3DS	Portable play station (PSP)	iPhone (どのモデルでも)	iPad (どのモデルでも)	スマートフォン (どのモデルでも)	タブレット (iPad以外のどのモデルでも)	その他 機器名
4 人目	Nintendo DS	Nintendo 3DS	Portable play station (PSP)	iPhone (どのモデルでも)	iPad (どのモデルでも)	スマートフォン (どのモデルでも)	タブレット (iPad以外のどのモデルでも)	その他 機器名

④お子様はどれくらいの頻度でその機器を使用しますか？当てはまる箇所に☑してください。
(一番使用頻度の高い機器の場合)

<input type="checkbox"/>	0 - 10 分	<input type="checkbox"/>	21 - 30 分	<input type="checkbox"/>	41 - 50 分	<input type="checkbox"/>	61 - 90
<input type="checkbox"/>	11 - 20 分	<input type="checkbox"/>	31 - 40 分	<input type="checkbox"/>	51 - 60 分	<input type="checkbox"/>	191 分以上

⑤お子様は一週間の内どれくらいの頻度でその機器を使用しますか？

<input type="checkbox"/>	一週間に1回	<input type="checkbox"/>	一週間に3回	<input type="checkbox"/>	一週間に5回	<input type="checkbox"/>	一週間に7回
<input type="checkbox"/>	一週間に2回	<input type="checkbox"/>	一週間に4回	<input type="checkbox"/>	一週間に6回	<input type="checkbox"/>	一週間に7回以上

⑥お子様は平日、一日の中でいつその機器を使用しますか？当てはまるものすべてに

してください。

<input type="checkbox"/>	午前中	<input type="checkbox"/>	午後	<input type="checkbox"/>	夜（就寝前）
--------------------------	-----	--------------------------	----	--------------------------	--------

下記の項目について、あなたのご意見をお聞かせください。当てはまる回答を○で囲ってくだ

⑦お子様は週末、いつその機器を使用しますか？当てはまるものすべてにしてください。

<input type="checkbox"/>	午前中	<input type="checkbox"/>	午後	<input type="checkbox"/>	夜（就寝前）
--------------------------	-----	--------------------------	----	--------------------------	--------

私は意識的に子どものテクノロジーの使用を監視している。	強く反対	反対	やや反対	どちらでもない	やや賛成	賛成	強く賛成
保護者が子ども達にインターネット上での適切な行動について話すことは良い考えだと思う。	強く反対	反対	やや反対	どちらでもない	やや賛成	賛成	強く賛成
子どものテクノロジーの使用を監視することはプライバシーの侵害になる。	強く反対	反対	やや反対	どちらでもない	やや賛成	賛成	強く賛成
子どものテクノロジーの使用を監視することは子どもの安全を守ることになる。	強く反対	反対	やや反対	どちらでもない	やや賛成	賛成	強く賛成

使いやすさについて							
スマートフォン、タブレット、またはその他のICTを使用することは...							
(ICTとは、Information and Communication Technologyの略で情報通信技術の略を意味します。)							
1.子どもの学業成績を向上させる。	全くそう思わない	思わない	あまり思わない	どちらでもない	少し思う	思う	強くそう思う
2.子どもの学習能力を向上させる。	全くそう思わない	思わない	あまり思わない	どちらでもない	少し思う	思う	強くそう思う
3.子どもの学習効率を高める。	全くそう思わない	思わない	あまり思わない	どちらでもない	少し思う	思う	強くそう思う
4.私の子どもはスマートフォン、タブレット及びその他ICTテクノロジーの使い方を自分で操作できる。	全くそう思わない	思わない	あまり思わない	どちらでもない	少し思う	思う	強くそう思う
5.私の子どもは、授業の中でスマートフォン、タブレット及びその他ICTテクノロジーを活用する場合、簡単に操作できると思う。	全くそう思わない	思わない	あまり思わない	どちらでもない	少し思う	思う	強くそう思う

学びの機会について							
スマートフォン、タブレット、またはその他のICTを使用することは...							
1.子どもにテクノロジーを試みる機会を与える。	全くそう思わない	思わない	あまり思わない	どちらでもない	少し思う	思う	強くそう思う
2.子どもの学習過程を管理できる。	全くそう思わない	思わない	あまり思わない	どちらでもない	少し思う	思う	強くそう思う
3.学習した事を経験する機会を与える。	全くそう思わない	思わない	あまり思わない	どちらでもない	少し思う	思う	強くそう思う
4.様々な分野を行き来できる。	全くそう思わない	思わない	あまり思わない	どちらでもない	少し思う	思う	強くそう思う
5.他の子ども達と交流できる。	全くそう思わない	思わない	あまり思わない	どちらでもない	少し思う	思う	強くそう思う
6.批判的に考える事ができる。	全くそう思わない	思わない	あまり思わない	どちらでもない	少し思う	思う	強くそう思う

7. 子ども達にやる気を起こさせる。	全くそう思わない	思わない	あまり思わない	どちらでもない	少し思う	思う	強くそう思う
--------------------	----------	------	---------	---------	------	----	--------

BYODプログラムについて (BYODとは、Bring Your Own Deviceの略であり、授業で使用するために幼稚園や学校にそれぞれ自分達が持っている機器を持参することを意味します。)							
1. 私の子どもは、幼稚園年少から自分の機器を幼稚園に持参するべきである。	強く反対	反対	やや反対	どちらでもない	やや賛成	賛成	強く賛成
2. 私の子どもは、幼稚園年中から自分の機器を幼稚園に持参するべきである。	強く反対	反対	やや反対	どちらでもない	やや賛成	賛成	強く賛成
3. 私の子どもは、幼稚園年長から自分の機器を幼稚園に持参するべきである。	強く反対	反対	やや反対	どちらでもない	やや賛成	賛成	強く賛成
4. 私の子どもは、小学校一年生から学校に自分の機器を持参するべきである。	強く反対	反対	やや反対	どちらでもない	やや賛成	賛成	強く賛成
5. 私の子どもは、小学校二年生から学校に自分の機器を持参するべきである。	強く反対	反対	やや反対	どちらでもない	やや賛成	賛成	強く賛成
6. 私の子どもは、小学校三年生から学校に自分の機器を持参するべきである。	強く反対	反対	やや反対	どちらでもない	やや賛成	賛成	強く賛成
7. 私の子どもは、小学校四年生から学校に自分の機器を持参するべきである。	強く反対	反対	やや反対	どちらでもない	やや賛成	賛成	強く賛成
8. 私の子どもは、小学校五年生から学校に自分の機器を持参するべきである。	強く反対	反対	やや反対	どちらでもない	やや賛成	賛成	強く賛成
9. 私の子どもは、小学校六年生から学校に自分の機器を持参するべきである。	強く反対	反対	やや反対	どちらでもない	やや賛成	賛成	強く賛成
10. BYODプログラムは、私の子どもが大きくなるにつれて、より重要になると思う。	全くそう思わない	思わない	あまり思わない	どちらでもない	やや賛成	賛成	強く賛成

BYODプログラムについて (BYODとは、Bring Your Own Deviceの略であり、授業で使用するために幼稚園や学校にそれぞれ自分達が持っている機器を持参することを意味します。)							
11. 保護者は、BYODプログラムが導入される前に、相談の機会を与えられるべきである。	全くそう 思わない	思わ ない	あまり思 わない	どちらでもない	やや賛成	賛成	強く賛成
12. 日本の公立小学校は、BYODプログラムを導入する準備が整っていると思う。	全くそう 思わない	思わ ない	あまり思 わない	どちらでもない	やや賛成	賛成	強く賛成