

The Use of YouTube and Apps by Digital Moms to Support Early Childhood Learning

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This research aims to understand the use of ICT, in this context refers to internet, gadget, including apps and websites by digital moms to support early childhood learning. This is an explorative qualitative research. Four pairs of mother and child become the research subjects. The data shows that digital moms as active users of ICT, including internet, have also introduced and used the technology to support the learning activities of their children, even though not as the main and only medium. The early childhood skills include early mathematic skill, early literacy skill, socio-emotional development, and executive function. The result shows that those all four skills can be supported by the use of ICT (internet, gadget, websites, and apps). All children in this research access YouTube as entertainment source and also learning, and one of the children accesses game to learn math.

Keywords: digital moms, early childhood learning, early childhood skills, online game, YouTube

Introduction

Child education starts really early, since they are born (UNESCO, 2016). According to UNICEF, pre-primary education is an integral component of early childhood development, which refers to all the essential policies and programmes required to support the healthy development of children from birth to 8 years of age, including health, nutrition, protection, early learning opportunities and responsive caregiving (UNICEF, 2019).

Up until now in the year 2021, children in early childhood include in Alpha generation, with year of birth after 2010. This generation is known as a generation that familiar with technology and their needs for communication has been well-facilitated. Besides, according to the study from Santos and Yamaguchi, face-to-face interaction among them is more well-appreciated because it becomes a quite rare event due to communication technology development (as cited in dos Reis and Thompson, 2018). This condition, to some extent, affects the parenting style of their parents.

In general, early childhood education is associated with mother's role. Mothers have an important role in the progress and development of their children's education. Some elementary schools in Victoria, Australia, involve mothers in their education, both materially, participating in teaching certain skills to children, and developing the curriculum (Pidarta, 1997, p. 242).

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But there are also children who get their early childhood education through activities in playgroup and preschool. Nowadays, however, early childhood education has been changing with the emerge of ICT (Information and communication technology), which refers to digital hardware and software and also the network that connect it, the internet.

The emergence and development of ICT has driven the emergence of information society, which functions around the axis of information (Haddon and Silverstone, cited in Webster and Hermann, 2000, p. 251). Mothers or moms are a part of this society. Digital moms use technology on daily basis, and even use it for helping them in parenting (MWW, 2015).

One form of information that can be used by moms is the one that related to early childhood education. Apps in iOs and Google Play and also videos on YouTube provide choices for moms to search content that suitable for their children.

Chalim and Anwas (2018) conducted a research on students' behavior in using internet, the role of parents and teachers in supporting students using internet as study resource, and factors related to intensity of internet use for study. The result shows that the use of internet as study resource is high. It has an impact on the high concern of the parents in supervising and controlling their children in studying and using internet. Besides, teachers are also required to use internet in the study process (Chalim and Anwas, 2018, p. 40).

This research focuses on the use of ICT by moms to support education and learning that different from many previous researches, which focus more on the impact, especially negative impact of ICT on children. Thus, this research is important to understand digital moms' way of thinking and their reason in using ICT for their Alpha-generation children. This research tries to answer: How digital moms in Yogyakarta use website and applications to support early childhood learning? Hopefully this research can be a baseline for further research concerning on technology and early childhood.

Literature Review

Digital Age and the Information Society

The emergence of internet has changed the media typology. It started the era of interactivity – the digital age (Holmes, 2005, p.10). Interactivity that provides by internet as a media has brought a new way of communication among people in a society, and by all means its culture. Levin and Mamlok (2021) states that the digital age signifies the transition to what we described as the technological culture (p. 11).

Technological culture may be simply reflected through the use of smartphone, a small device that change the way people conduct their lives. Smartphone is now used by all ages, even young children. It also becomes an important part of our daily lives as it never leaves our hand. As stated by Levin and Mamlok (2021, p.

3), the immediacy of communication and the constant availability are parts of the cultural change in the digital age.

Technology as one determinant of the digital age, becomes the foundation of a digital society (Levin and Mamlok, 2021, p. 11). According to Redshaw (2020, p. 2) a digital society can be characterized by new forms of 'techno-social life'. It can be understood that in this type of society, people use the technology in all means of interaction with others. For example, the interaction between parents and their children which involves technology, such as to communicate, taking picture, learning, or even parenting.

In the digital society, internet and technological devices play such a huge role. It has changed the way people produce, consume, and distribute information. Lorenzo Cantoni and Stefano Tardini state that digital information and communication technologies (ICT) becoming more and more a necessary tool in order to be fully introduced into the information society (in Rivoltella, 2008, p. 28). In this research, we use the definition from Hiranya K Nath and Pier Cesare Rivoltella. Nath (2009) defines information society as a post-industrial society, in which information plays an important role in their lives. Meanwhile according to Rivoltella (2008, p. 28) information society can be defined as a society in which low-cost information and ICT are in general use.

According to Webster (2006), there are five characteristics of information society:

- a. The development of technology affects the pattern of business, politics, and personal life globally.
- b. Information plays an important role in shaping and defining a new economic structure.
- c. Sociologists conceptualize information society through changing in employment structure and its impact in creating a new social structure.
- d. ICT development has reduced the problem of time and space.
- e. Cultural concept of information society is closely related to their information environment. This environment tends to be penetrative, intimate, and affect more in daily life. There are three dimensions in the development of this information environment: (1) escalation in information circulation due to technological development, (2) high complexity in social relations, and (3) excessive penetration of information that can create problems in society.

Digital Mom

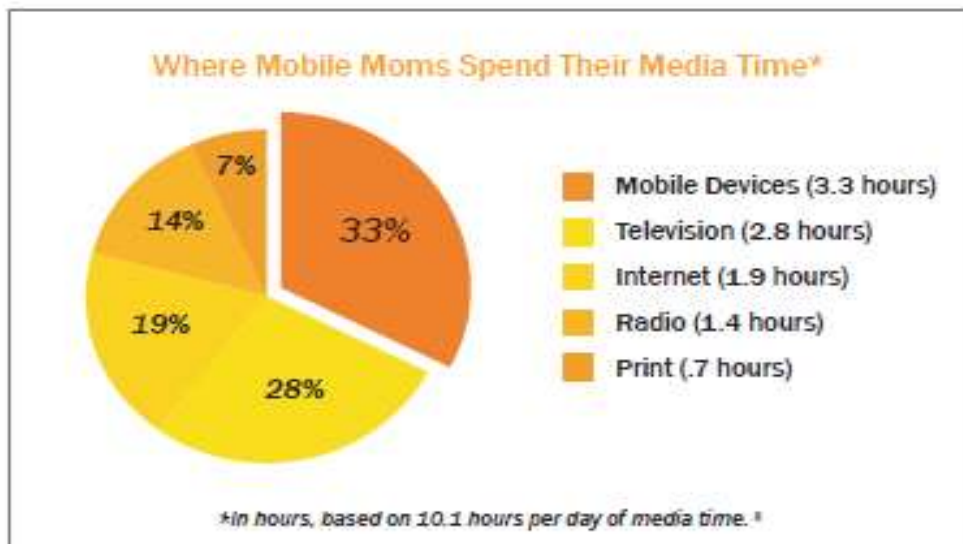
Moms' life as part of information society has also been affected by technology. At some point, motherhood is now different than in earlier generations. The availability and dissemination of information reconstruct the approach of a mother (Gibson and Hanson, 2013, p. 321). It is now possible for digital moms to use technology, even the simplest such as a mobile phone to communicate even with their young children (Gül Ünlü, 2019, p. 147).

Digital moms refer to women who have children and have digital habits. According to research of MWW in 2012, there are six characteristics of digital moms (MWW, 2015):

- a. Commonly has two children.
- b. Financially struggling, but does not affect what they want to do and achieve.
- c. Three out of five digital *mom* see themselves as an *influencer*.
- d. 60% of Digital Moms play online games.
- e. Choose to communicate via text than call.
- f. Usually has a Facebook account.

Digital moms are closely related to millennial moms' context, which is a group of mothers who were born between 1978 and 1994. The familiarity of millennials with technology makes the majority of mothers in millennials generation are also digital moms. Moreover, both digital mom and millennial mom share a main character, which is socially connected (Shandwick, n.d., p. 3).

Figure 1. Media Consumption of Digital Mom



Source: Thundertech, 2013.

The familiarity and closeness of digital mom with their gadget are pictured by Thundertech (2013) in Figure 1. Mobile device is the medium used the most by digital mom, with average time of usage is 3.3 hours a day. Digital mom chooses to use gadget with three reason: easy to use, proximity (the gadget is always with them), and privacy.

There are five types of digital mom: practical adopters, wallflowers, casual connectors, mobilizers, and urban originals. Those five types are differentiated from how they choose technology and what motivate them to use the technology. From five types, four of them are related to how digital mom use technology for parenting (MWW, 2015):

- a. The practical adopters will use the technology to organize their lives and family.
- b. The casual connectors who interact with children using, mainly, technology. This type also tends to use technology to search information about parenting.
- c. The mobilizers also tend to use technology to search information on parenting.
- d. The urban originals usually use technology to share their experiences or upgrade their capability as parents. From four types mentioned above, this type is the most parenting-oriented type.

According to Gül Ünlü (2019, pp. 160–161), women use of the digital communication tools depends on the age range of their children.

Early Childhood Education

United Nations declared Sustainable Development Goals (SDGs) in 2015, which included early childhood education as a global agenda SDG Target 4.2. The goal is that by 2030 all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education (UNESCO et al., 2017, p. 7). Accordingly, we assume that early childhood education needs more attention, including in Indonesia as UN member.

In this research, early childhood education refers to UNESCO guideline, and some international organizations such as World Bank, UNICEF, dan Brookings Institution. Early childhood education according to UNESCO (2012, p. 26) is on level 0, which aims to develop socio-emotional and academic skills that are needed to entering school (elementary school).

There are two categories in ISCED level 0, *early childhood educational development* and *preprimary education*. The first category refers to children in age 0-2 years old, and the second category refers to children in the age of 3 up to before entering elementary school, in Indonesian context it means 6 years old (UNESCO, 2012, p. 26). This research focuses more on *preprimary education*, which has educational characters, namely children interaction that can increase the use of language and social skill, development of logics, and speaking through thinking process. Introduction to alphabets and math concept, and encouraging to explore the surrounding environment are also included in the educational goals at this age range (UNESCO, 2012, p. 27)

In order to evaluate early childhood skills, this research refers to a model module by UNESCO et al. (2017). A bit different from UNESCO, this module aims to look at children's skills at age range of 4-6 years old, instead of 3-6 years old. MODEL module in MELQO (*Measuring Early Learning Quality and Outcomes*) examines the development of children skills from their *early literacy skill, early mathematic skill, social-emotional development, executive function*.

a. Early literacy skill

This is basic skill for children to read, write, and using language, and also other abilities that support it. Phonological awareness in children can be developed with the help of rhymes and songs (UNESCO et al., 2017, p.43). MELQO prioritize four constructs to observe *early literacy skill*, which are:

1. Alphabetical skills, includes the knowledge of letters and its sounds (phonemes)
2. Phonological awareness, which develops gradually from words level, syllables level, rhymes, to phonemes level.
3. Expressive words, refers to words that a child is able to say.
4. Listening skill, refers to the ability to read and understand an instruction (UNESCO et al., 2017, pp. 43–44).

b. Early Mathematic Skill

This skill refers to basic math skill in early childhood, which gives a useful tool for children in understanding their surroundings (Butterworth, 1996; NRC, 2009, cited in UNESCO et al., 2017). In early childhood education, this concept relates to numbers and its operationalization, geometry including the concept of space and measurement. Model module has six constructs in order to observe this basic math skill, which are: (UNESCO et al., 2017, pp. 40–42):

1. Verbal counting, refers to the knowledge of mentioning numbers and its order.
2. The knowledge of the order of numbers is not the same as the knowledge of quantity.
3. Early child often encounters with a small scale of “addition”.
4. Early child encounters with number in his daily life in clock, house number, price, phone numbers, and others. Children will have to learn to remember the number and its lexical (number in word) (Chard et al., 2005, cited in UNESCO et al., 2017).
5. The development of spatial language varies in each culture, and children have significant understanding on spatial relations that becomes the basis of language proficiency (Sarama and Clements, 2009, cited in UNESCO et al., 2017).
6. Measurement activity can help children to create a simple framework of thinking in problem solving. Even before a child can use a specific measuring word (e.g., ‘I am taller’) (Pruden et al., 2011, cited in UNESCO et al., 2017).

c. Socio-Emotional Development

This development refers to children social and emotional behavior, which consist of several interrelated skills, including self-regulation, social cognition, and its implication to prosocial behavior, social ability, social

welfare, and also learning approach. *Social-emotional development* is a learning process about what is good socially and culturally (UNESCO et al., 2017, p. 37).

The latest concept about socio-emotional skill in preschool age children focuses more on two areas, children competency in building and maintaining relation with other people, and self-regulation or children ability to manage their emotion for the sake of positive participation in social interaction (Thompson, 2015, cited in UNESCO et al., 2017, p. 39). Social cognition is associated with children ability to think about and to understand the social relation with other people, recognizing other people's feelings, and taking action to make others happy if necessary. Social cognition includes empathy, and prosocial. Understanding others' feeling includes the ability to (1) understand basic emotion, like happy, sad, angry, and to express those emotions, including the trigger, causes, and the consequences; (2) to recognize the complexity of emotion; and (3) to differentiate the rule of standard and complex expression of emotion (e.g. shame and guilty).

d. Executive Function

Executive function refers to a group of skills that encourage children's learning areas, including memory, self-regulation, mental flexibility. *Executive function* competency shows the skill that helps children and also adults to focus on important matters, bring up ideas, change focus, and control urges (UNESCO et al., 2017, p. 35).

There are three main elements that are associated with *executive function*, namely *working memory*, *inhibitory control* and *flexible switching* (Liew, 2012, cited in UNESCO et al., 2017). *Working memory* is related to the general intellectual ability, math, and reading. *Inhibitory control*, along with *flexible switching*, are identified as the first skill that emerges and develops in early childhood (Diamond and Doar, 1989; Diamond et al., 2002, cited in UNESCO et al., 2017). *Inhibitory control* helps children to suppress inappropriate behavior and thoughts that they feel can disturb their concentration in understanding instruction (UNESCO et al., 2017, p. 36).

Internet and Children

From time to time, the number of children that join the digital network and interaction is increasing. It shapes their experience and growth, it also opens their opportunity to learn and socialize (UNESCO, UNICEF, Brookings Institution, and World Bank, 2017, p. 8). In the last five to six years, the number of internet users with the age under nine years old has increased. The media used by these children to access the internet are smartphone and tablet, which have become important devices in their culture (Holloway et al., 2013, p. 4).

The majority of children consume digital media to play game and watch video streaming (Livingstone et al., 2015). At this stage, children can be introduced to mass production content, but also can be trained to create content.

Guidance and supervision from parents are important due to the risks and consequences from the use of technology and interaction in internet, such as security and privacy (UNICEF, 2019, p. 8). Parents play role as mediator to prevent the risks. In this matter, parents may become the policy-makers for their children's media consumption. According to Livingstone et al. (2015) there are five strategies in parents' mediation:

- a. Active mediation for internet user: to talk about internet content and online activities with the children, to sit near the children when they access the internet, and to actively share their children's online experience.
- b. Active mediation for internet security: to do some activities and to give recommendations in order to raise responsibility and caution in using internet.
- c. Restrictive mediation: to create rules in children's internet usage, e.g., access duration, access location, content to watch, and limitation in children internet activities.
- d. Technical restriction: to use software or other device to limit, filter, and monitor children's internet usage.
- e. Monitoring: to check the history and digital footprints after the children finished using internet.

Parents' mediation is needed in children's activities related to digital media, especially for children in young age. However, it is also a new opportunity that new technologies not only can be used to entertain young children but also to learn. Children can now have access to do creative learning through technologies because in the digital age, learning can and must become a daylong and lifelong experience (Resnick, 2002, p. 36).

Methodology

This research is an explorative qualitative research to find out the use of ICT by Digital Moms as learning medium for children in early childhood. The data are collected through in-depth interview and observation. The subjects of this research are mothers, who were born between 1978 and 1994, have child (children) with age 4 to 6 years old, access internet minimum three hours a day, give their children access to a gadget, and want to participate in this research. With those criteria, four mothers have been chosen to be informants in this research.

Results

Mimi (29), Lia (34), Chika (26), and Aya (34) are the informants of this research. All of them were born between 1978 and 1994. The first informant is Mimi (29), has one child. A six years old girl, further will be mentioned as Z (6). Right now, Mimi is working as an employee of a private education company in Yogyakarta. Mimi has a master degree, which she took in the UK. Not only working as an employee, she also is an author.

The second informant is Lia (34), she has one child, a five years old girl, further will be mentioned as V (5). Lia has her own culinary business. She finished her bachelor degree from a private university in Yogyakarta. The third informant is Chika (26), a stayed-at-home mother, who has a four years old girl, M (4). Chika's last education level is high school. The last informant is Aya (34). She is a kindergarten teacher and has two children. Both children are boys, 9 years old and 4 years old. R (4) will be the subject of this research. Aya's last education level is bachelor degree.

All of the informants have different habits in media consumption. Mimi (29) depends her needs of media on internet connection because she prefers YouTube and other social media platform to search for information and entertainment. Meanwhile Lia (34) uses internet just to check on Instagram and WhatsApp as her business supporting platform. Lia also consumes TV and radio, but just as a companion while she is doing other activities, like baking.

Chika (26) consumes all media, from internet to conventional media like TV, radio, and magazines. Chika is also an active social media user. She makes content for her TikTok account at least once every two months. Meanwhile for YouTube, she chooses just to watch the content instead of producing one. She is active in WhatsApp but not in Instagram, Facebook and Line. Aya (34) chooses internet to look for information using her gadget. She actively uses Facebook and Instagram, but also sometimes she listens to radio. Lia and Aya are the informants with the least access to the internet, between 3-5 hours a day.

Even though all the informants have different habits in using gadget and accessing the internet, all of them are active users with different aims. The aims are associated with their daily activities. Mimi, for example, is very active in social media. She claims herself as a social media addict, but her job also requires her to access the internet. Moreover, she is a novel author who needs social media to promote her book and to interact with the readers. Lia, who owns a culinary business, uses internet and social media to communicate with her customers, to promote her products, and also to search for recipes. Chika, as a stay-at-home mom, feels like she has a fair amount of free time that than she uses to make TikTok contents. Meanwhile Aya accesses the internet to search for recipes to support her cooking hobby and news, including infotainments.

All the informants state that they do not use information from the internet as their main source for parenting. For Mimi, internet provides too many information which can be confusing, and she believes that mother understands better her child's condition. Mimi as one of the informants that very active in virtual world

says that there is a certain demand that should be fulfilled by the millennial mom, especially related to children's show/program that increasingly diverse.

“As a millennial mom, we have to remember the characters in our child's favorite show. For example, Z likes to watch Korean show, Pororo. I did not know all the characters. Z talked excitedly about them and when I tried to guess one of the characters, Poby, she said ‘Nooooooo’ angrily. From that moment, I did my homework and watched her favorite shows, *googled* and tried to remember all the characters.” (Mimi, interview, 2 August 2019).

Lia states that technology somehow has affected her life as a mother, especially because of the information on parenting and new entertainment form for children. Meanwhile Chika says that technology has made her life easier, specifically the internet in the context of finding cooking ideas and also adding knowledge on science.

All children from the informants, Z, V, M, and R also consume different media. Z (6) does not watch TV at all at home, she depends on internet, like YouTube and social media with limited duration. It is also caused by her full activities at school until evening, so she does not really have much spare time. Meanwhile V (5) consumes YouTube, *offline* videos on gadget, and also television, but she is not allowed to access social media. M (4) consumes television, radio, YouTube, and Mombi magazine. Even though Chika admits that radio plays more adult songs, M enjoys the rhythm. R (4) also consumes television, besides YouTube in Saturday and Sunday.

In the midst of pros and cons of internet effects on children, all of the informants agree that internet and technology are useful for their children. Mimi, for example, argues that there is nothing good to watch for children in television nowadays. Lia states that internet and technology have helped her in assisting V in learning.

“Well, I am not always able to accompany her, so gadget and all information in it can help her to find information that she needs, that maybe I have not had the chance to share it with her yet. For example, she looked for information about mixing colors, or about shapes. Yes, for me it is helpful.” (Lia, interview, 16 August 2019)

Different with Z, R, and V that have no problem interacting with new people, M is the youngest and she is very quiet. It takes a while for M to give feedback. It becomes one of the reasons for Chika to feel that internet has somehow contributed in increasing M's skill and courage.

“The biggest advantage is now M wants to sing. She is very shy and very quiet. But after watching songs in YouTube that she likes, she starts to sing along. For example, ‘Let It Go’ (Frozen). I am very grateful that now she talks more.” (Chika, interview, 23 August 2019).

Meanwhile for Aya, she admits that technology and internet are now an important aspect in children's lives, but parents have the responsibility to supervise (Aya, interview, 8 November 2019).

Nevertheless, all the informants do not deny the negative effects of the content in internet, especially YouTube, so that all of them decide to limit and supervise the internet access of their children. Mimi just allows Z to watch YouTube in *offline* mode, means that all the videos have been downloaded first. Z only watches YouTube *online* on Saturday, when she accompanies Mimi at the office. However, Z has the freedom to choose the video that she wants to watch, of course with Mimi's permission.

"She (Z) just needs to show me the videos she wants to watch. Once when she was 4.5 years old, she wanted to watch Elsa (Frozen), but when I check the video is entitled "Elsa is getting pregnant from Spiderman". The video appeared in *home* due to her recent watching activity." (Mimi, interview, 2 August 2019).

Lia also gives freedom to V to choose what she wants to watch, but Lia sets the YouTube to show only content for children. Lia is selective in using gadget and internet access. She has to know what V is watching. When Lia is not familiar with the video's sound, she will check because one time Lia found a disturbing content. This video also appeared in *home* because it is played by children (Lia, interview, 16 August 2019).

Meanwhile, Chika decide to choose what M can watch, even though this is contrary to what her husband does. Chika realizes that M is still easily affected by the message in YouTube video. Thus, Chika needs to be very careful and supervise what M watches.

"One time, she watched a cartoon which showed a kid who does not want to go to school, and the next morning M did not want to go to school. She imitated exactly what she watched. It lasted in 3 days." (Chika, interview, 23 August 2019)

During the interviewing process, researchers observe how all mothers supervise their children in accessing internet or apps with their gadget. Mimi, for example, has to listen to Z's story about what she is watching, and Z's father is always ready to help Z when she cannot finish a game.

Lia asks V about the video she is watching. Lia also encourages V to type herself if she wants to watch a specific video. V is still learning to write and read, so it is a part of learning when she types in YouTube search box. Lia just helps her to recognize the alphabets through its phonemes, while Chika actively helps M to search video on YouTube or to install a new game for M.

The rules of the duration for each child in accessing internet and using gadget can be seen in Table 1.

Table 1. The Duration for Each Child in Accessing Internet and Using Gadget

Name	Duration	What to access
Z(6)	30 minutes	Offline videos (everyday), online videos (Saturday), social media with Mimi's permission
V(5)	20 minutes	Online and offline video, no game and social media.
M(4)	4-5 hours (sometimes less)	Online video, making TikTok video with Chika, social media content with Chika's permission only.
R(4)	2 hours only in Saturday and Sunday	Online video

Source: primary data.

Table 1 shows that M has the longest duration in interacting with gadget and internet. Chika states that somehow, she is also really active in internet and intensely using her gadget, she cannot be a good example in limiting M's duration.

"I have tried to limit her time, but M disagreed because her friends here (in the neighborhood) can use their gadgets without time limit. But I also realize that I cannot really be separated from my gadget either, and be a good example for her." (Chika, interview, 23 August 2019).

This research involves four children, with different age in early childhood age range, different duration and activities in accessing internet and using gadget. The mothers of these children are all millennial moms also with different education background, and different habits and rules in using gadget and accessing internet. The observation data show that different early skills develop differently among children.

Early Literacy Skill

Z is the oldest child in this research, 6 years old. She has developed the early literacy skill. She easily remembers all the names and characters in each video that she watches, she can also differentiate each character even though it probably looks similar one another. Z pays attention on the clothes of the characters to distinguish them. Z is also able to know the relationship between characters (friends or family).

Moreover, Z is able to retell the story from what she has watched in her own simple words. Mimi encourages Z to write a story on her own. According to Mimi, Z learns to write stories in formal language from the video she watches. For example, Z wrote about Rapunzel with a polite and formal form of language.

"Z can already write and read, now she learns to write stories. She wrote about Rapunzel. I think it is the politest version of Rapunzel because the guard asks permission first to the witch before taking the flower. What surprise me is that she wrote "the guard is up to his courage" She usually only says "of course he is brave!" (Mimi, interview, 2 August 2019)

V's early literacy skill can be seen during observation. V (5) has been able to recognize alphabets and write it in the YouTube *search box*, even though with Lia's help. For example, when V tried to write 'INDONESIA', V wrote 'INTONESIA'. Then Lia helped her by dictating the alphabets. Lia also introduced her to spacebar. Moreover, V is able to re-tell the story she has watched with her own words. For example, baking video, V is able to tell how to make coffee cookies. But for story video, V still has difficulty in understanding the storyline.

Meanwhile, the observation on M (4) shows that she is not able to recognize alphabets to arrange a word, so she needs help from Chika to search video in YouTube. But M is able to recognize characters and its names. Chika encourages M to watch videos that can support M in developing her language ability.

R (4) is the only second child in this research. Some of the observation results about R are a bit different from other children. For his *early literacy*, he is able to tell the story about a shark ride in Universal Studio. R also recognizes the character in Transformer, Optimus Prime, in the video and other robot characters. R not only watches videos chosen by Aya, but he also follows what his big brother watches.

Early Mathematic Skill

Early mathematic skill is very obvious from Z's (6) observation result. She shows it when she plays a math game in her gadget. This is an addition game that consists of several levels from easy to hard. Z has succeeded finishing all the questions up to orange level, the medium-hard level. The last question she did, was $15+17$. Mimi helped her with a clue "5 plus 7 is?" Z then found out the answer for the math question, "Oh, I see, the answer will be the one with 2 as the last number, it is 32"

M (4) does not use gadget and internet to learn math because according to Chika, M has enough time at school to learn math and M also has specific study time at home to learn writing, reading, and counting. During the observation, M was able to count the number of characters in the video. Similar to M, V does not watch video and play math game. Lia prefers to introduce simple counting manually. But V watches video about simple geometry.

Meanwhile R did not show this skill during the observation. We believe that this is not about his skill, but R tends not to answer question about learning subjects, except to his teacher. This is also confirmed by Aya,

"He will pretend he does not know the answer... but if his teacher asks, he will answer" (Aya, interview, 8 November 2019).

Socio-Emotional Development

Age is a factor that determines the socio-emotional development of children in this research. The older child shows more complex socio-emotional development. Z (6) is able to correlate what she watches in video with her real experience. During observation, Z watched a video from Babybus channel in YouTube. Z was able to re-tell the content.

“Babybus is singing because the baby crocodiles need to pee, and they have to queue” (Z, interview, 2 August 2019).

She can relate the content of the video with her daily life. Z says that people should queue in the toilet, and her mom (Mimi) has once reproved someone who did not want to queue.

A bit different with V (5), V still in the stage of imitating what she saw in the video or memorizing objects she saw in the video, and she can show and point it out afterward. It also states by Lia:

“She associates what she saw in video with her daily life. So, sometimes she watches a video about children who go shopping and review what they bought. For example, Yuppi candy. Then, when V and I went to do groceries, she could tell the exact product she saw in the video and she also imitates to review the product.” (Lia, interview, 16 August 2019).

R is also able to relate what he watches with his surroundings. Though it is not seen during the observation, but Aya explains:

“For example, R likes to watch Upin-Ipin. So, he sees Mail (one of the characters) like his friend at his grandmother’s house” (Aya, interview, 8 November 2019).

All four children with age of 4, 5, and 6 years old are able to show emotion, especially when they watch videos. They laugh when they see funny videos, or cover their face when there is something terrifies them. This basic emotional skill is more dominant in M (4).

Executive Function

Executive function skill in each child is different. M, for example, who is just 4 years old, has not been able to show this skill. She has not been able to choose which video is good for her, it looks like she randomly chooses the video she wants to watch. M tends to just imitate the video content, she did not want to go to school right after she watched a video, also strengthens the assumption that M has not developed the executive function skill. Thus, Chika always chooses and supervises M when she watches YouTube. However, M has shown her memorizing skill. She sings along when she watches music videos even though she still misses some words.

R (4) also has not been able to show this skill, just like M. it is probably because he is the second child, who, according to Aya, just follows what his elder brother does. R also cannot decide whether a video is good for him or not. Thus, he always asks Aya when he wants to watch a video. According to Aya, R sometimes still wants to watch videos that Aya has told him not to and will cry when Aya says no. In this matter, Aya keeps telling R which content is good for him and which one is not (Aya, interview, 8 November 2019)

Meanwhile, this skill has been developed in V (5), she shows that she can already choose video that is fine for her to watch. If then, she finds something not good in the video she can already identify it. For example, fighting scene. Lia, her mother, sometimes tests her ability.

“Sometimes, I pretend to be sleeping beside her to see what she actually watches. Surprisingly, she will change the video every time she sees something terrifying, including fighting. She will also change the video that she knows I have asked her not to watch it again.” (Lia, interview, 16 August 2019).

Z (6) has been able to identify values in a video, and decides whether it is good for her or not. During observation, Z watched a mandarin song. She did not understand the language but she understands the message through its visual. The video is about baby crocodiles that go picnic with a bus, but they need to pee. So, the baby crocodiles make a line and queue in front of the toilet. Z says it is the right thing to do. Mimi encourages this skill by always asks Z to re-tell the stories from the videos she just watched.

Discussion

All four mothers in this research are good examples of mothers who live in digital era and as a part of digital and information society. These mothers live closely with technology in their daily lives, especially smartphones, which they use for working, seeking for information and entertainment, and also for daily communication. It reflects what stated by Levin and Mamlok (2021, p. 3), that the immediacy of communication and the constant availability are parts of the cultural change in the digital age.

Both the interview and observation help to explore and understand what the research subjects do with their gadget to support their children learning activities. All mothers allow their children to use gadget and to access the internet. In line with the research from (Gül Ünlü, 2019, p. 147), that it is now possible for digital moms to use technology, even the simplest such as a mobile phone to communicate even with their young children, the mothers in this research use the smartphone to support their children learning. In this context, learning is seen as a communication process in which mother needs to deliver a learning message to their children.

However, each mother chooses different online activities to support their children learning activities. Chika, still uses conventional technique for M to learn writing, reading, and counting. Thus, Chika does not use gadget and internet to help M develop her *early literacy skill* dan *early mathematic skill*. Similar to Chika, Aya does not use gadget and internet to improve R *early mathematic skill*, Aya thinks that R is not really helped by gadget and videos in learning math. But Aya still use it for supporting R's *early literacy skill* for example to introduce colors.

Lia also does not use gadget and internet for improving V's *early mathematic skill* but still use it in *early literacy skill*, for reading, writing, and to communicate, and also other skills that relates to it. From the above explanation, it is clear that in

mothers' perspective, learning math for young children cannot be supported by YouTube and apps. They prefer that their children learn math with teacher at school, and using a conventional way of learning.

Lia uses video in internet for V to learn *letterland*. *Letterland* is an English teaching method, based on *phonics* to teach 3-8 years old children in reading, writing, and spelling. V goes to an international program that sometimes has the difficulties to differentiate spelling in English and in Bahasa Indonesia. This problem is associated with alphabetical skill in *early literacy skill*, which relates to the knowledge of alphabets' names and sounds (UNESCO et al., 2017, p. 43).

Meanwhile Mimi, states that gadget and internet have helped Z in literacy and math, direct and indirectly. Using an online math game directly improves Z's *early mathematic skill*. While Z's *early literacy skill* has improved with an indirect support from YouTube, includes alphabetical, phonics, and listening skill and also using expression words.

M, R, and V's early literacy skill is also supported indirectly by watching videos in YouTube. R and V are able to re-tell the simple story from a video. This skill is associated with listening skill, which refers to instruction acceptance and reading skill (UNESCO et al., 2017, p. 44). While M shows phonological awareness skill, which associated with the understanding of words, syllables, rhymes, and phonemes, through the songs she listens in YouTube. It is in accordance with the theory that phonological awareness in early childhood can be developed through songs (UNESCO et al., 2017, p. 43).

Internet can also be a learning medium to support children's *socio-emotional development* and *executive function*. These two skills are different in each child depend on, one of the factors, the age. The older child shows clearer and more complex socio-emotional development. Z (6) is able to relate the context she sees in the video with her daily life. Meanwhile V (5) is able to relate some objects in the video with her daily life.

M and R, who both are 4 years old, show basic emotion when they watch YouTube videos. Basic emotion includes laughing when seeing something funny or closing their eyes when there is something terrifying. Therefore, M and R have fulfilled one out of two areas in socio-emotional skill, which is basic emotion management (Thompson, 2015, cited in UNESCO et al., 2017, p. 39). In this research, the difference of these skills in younger and older children is obvious. Thus, it can be explored more in different context or even a very specific one, like in a specific apps or learning games.

In addition, this research found a different result from Gül Ünlü's (2019, pp. 160–161) research; women use of the digital communication tools depends on the age range of their children. In the context of using YouTube and apps for supporting children's learning, the mothers do not specifically choose the apps and videos based on their children age, but more to what their children like to watch or use, as long as it is suitable for children (not an adult content). Further work on this matter is important because the use of technology and internet content seems to be varied and it reflects a personal choice. According to Livingstone, et al. (2015), children tend to consume games and video streaming. It also can be seen from the children in this research. From this media consumption, children are introduced to

mass entertainment content. Children's media consumption is usually under parents' surveillance. Livingstone et al. (2015) explain five main strategies of parents' mediation: (1) active mediation for internet user, (2) active mediation for internet security, (3) restrictive mediation, (4) technical restriction, and (5) monitoring.

Mediation for internet user and also restrictive mediation are applied for Z, V, and R. The first strategy is used when parents discuss the internet content and online activity or can also be done by being near the children when they use internet (Livingstone, et al., 2015). Mimi is always physically being near to Z whenever Z accesses the internet. Mimi also talks about the content with Z. Lia choose to listen instead of always being near to V to supervise what she watches, and Aya is not too intense implementing this strategy but always asks R what he has watched by the end of the day. Meanwhile, restrictive mediation refers to the availability of rules for, namely duration, location, content, and other limitation and restriction for online activity (Livingstone, et al., 2015). For Z and V, the rule is set for duration, 30 minutes every day for Z and 20 minutes for V. Meanwhile R may watch YouTube 2 hours in Saturday and Sunday.

Chika uses only mediation for active user strategy by always be near M when she accesses the internet. But Chika does not implement the restrictive strategy in term of duration, because she had tried but failed. She believes that this strategy does not fit M.

The mothers decided to use the mediation strategies because of two main things. First, they realize the negative effects of internet are real. Secondly, they have personally experienced the negative effects of internet content or caught their children watched unsuitable content. However in this research, M is the only child, whose behavior was really affected by YouTube content.

Conclusion

This research tries to understand the use of ICT, in this context means gadget, internet, apps, and YouTube, by digital moms to support early childhood learning. The results show that digital moms as active ICT users introduce and use the technology to support their children's learning skills. But they do not use it as the main medium for learning. Thus, a blended learning, that refers to a conventional way of learning and is supported by technology, is seemingly more suitable for young children.

Early childhood skills include *early mathematic skill*, *early literacy skill*, *socio-emotional development*, and *executive function*. The results show that all skills can be developed with the support from ICT (internet, gadget, YouTube, and apps). All children in this research access YouTube as the source of entertainment and also learning, and one of the children uses online game to learn math.

All mothers in this research believe that technology is important and useful for supporting children education and learning, starts from a simple matter such as number, alphabets, colors, and shape. Simple things that are important for early childhood learning. However not all mothers agree that technology can replace the

conventional method of learning. For example, two informants see that *early mathematic skill* will improve more through lesson at school.

Early literacy skill and *socio-emotional development* seem to be the skills that can be improved with the help of internet, for example through YouTube content about colors, recognizing characters, or by typing independently in YouTube search box. The most visible *socio-emotional development* is when children can express their happiness because of a funny video, or express their fear by closing their face, and also show their interest for a content.

Meanwhile, *executive function* seems to be difficult to improve with only depends on internet. Parents need to supervise the children when accessing and choosing contents. Through this supervision, children will slowly learn which content is good for them. Besides, age is an important factor that affects the skills that each child can master. For example, the 6 years old child has the ability to relate the YouTube content with the surroundings, including deciding whether it is good or bad. With the similar content, younger children have not been able to do the same.

This research is a qualitative research that cannot be used to generalize the use of ICT by all mothers. Some interesting findings occur in research but cannot be explained further because those are not the focus of this research; (1) YouTube videos are interesting for children, it does not matter whether they watch it offline or online, this research does not focus on the motive why they choose YouTube, (2) data shows that the first child (the only child) has different pattern in accessing YouTube with the second child (having elder brother/sister), (3) the age of the children is not the main consideration of mothers in using YouTube or apps, (4) the difference of *socio-emotional development* and *executive function* skill in younger and older children can be explored further in more specific learning medium using technology, for example online games.

To conclude, we acknowledge that this exploratory study could not fully exclude the possibility of social desirability effects. Nonetheless, we argue that this study has added new knowledge on children early learning using technology from the perspective of mothers, as much as it is generating new topic for further research.

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