Digital Play, Is It True Play?

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Abstract

In the past, playing was done offline, and various tools or physical resources were usually used to support the play (non-digital play). As time goes by and the digital era enters, a new classification of play is discovered, namely playing using technological devices (digital play) (Marsh et al., 2016; Undheim, 2022a). However, this raises the question of whether digital play has the same essence in terms of play, which is supported by play theories that can support children's development. This research focuses on the concept of digital play in early childhood. This study utilizes a literature review. Data were collected through Preferred Reporting Items for Systematic Review and Meta-Analyze Extension for scooping reviews using 3 databases, namely; Google Schoolar, Science Direct anda Taylor & Francis Online Journal databases. The presentation brings out the concept of digital play with the support of play theory and its influence on early childhood development then how teacher support digital plat, which will be used in the research to seek advice from the audience. The concept will provide an improved understanding of digital play for early childhood.

Keyword: digital play; digital; play; concept; early childhood

1. Introduction

The literature on play is vast, but it is clear that the concept of play has been defined and categorized in various ways. (Savage & Barnett, 2017). Playing using digital devices, which will be further referred to as digital play, has emerged as a qualitatively different type of playing classification. (Kulman, 2015; Salonius-Pasternak & Gelfond, 2005).

The use of digital technology in the context of early childhood learning is by using technological devices such as applications, software, and cyber resources; the devices can be screen-based technology (computers, tablets, mobile phones, and interactive whiteboards), non-screen-based technology (projectors, cameras, and 3-dimensional printers), technological exploration devices such as digital microscopes, and digital toys such as robots, coding toys (bee-bot, Kubo and Osmo) (Undheim, 2022b)

In early childhood education, which emphasizes the essence of play, the implementation of technology in learning is slightly different from that at the primary and secondary education levels (Bourbour, 2023) which can even become an obstacle in integrating technology into early childhood education because of the understanding of open and exploratory play in conventional play concepts. (Edwards et al., 2020) moreover Palmer (2016) states that digital games are not real games. This study will examine the concept of digital play in early childhood, which emphasizes natural play, and how it affects children's development.

2. Literature Review

2.1 Concept of Play

Play is the most crucial component that aims to support early childhood learning and development (Hughes, 2013) and behavior that appears simple but, if explored further, will involve complex behavior (deRenne-Stephan, 1980; Knox, 1997; Reilly, 1974; Robinson, 1977; von Zuben et al., 1991). Thus, play is a primary pedagogical approach in early childhood education and is viewed and used as a means of enabling young children active, hands-on engagement with materials as a way of fostering knowledge about the world (Edwards, 2019). Pellegrini dan Smith (2008) Noted that play is an activity carried out for one's benefit, carried out in a fun way, not oriented towards the result, flexible, active, and cheerful. That means that playing is not an activity to please other people but solely because of one's own will. Therefore, playing is fun and is done in enjoyable ways for the player. Children do not think about the results of playing because the process is more important than the final goal. Play is also flexible, so children can create new combinations or act in new ways that are different from before. Playing is not a rigid activity. Playing is also active because children are involved and do not pretend to be active. Playing is also cheerful and positive because it makes players smile and laugh, and they enjoy what they are doing.

Thus, playing is an activity that is fun, personal, process-oriented, flexible, and has a positive effect on children's learning and development. Playing can also be defined as an activity carried out for fun and without considering the end result. These activities are carried out voluntarily, without coercion or pressure from outside. (Hurlock, 1999).

2.2 Digital Play for Early Childhood

Young children experience new play opportunities since digital device became part of everyday life (O'mara & Laidlaw, 2011). Thus, many young children grow up in societies with broad access to various digital technologies intertwined in their everyday lives (Arnott & Yelland, 2020; Chaudron et al., 2018; Danby et al., 2018; Yelland, 2018). Digital play is a new concept in early childhood education and care related to the emergence of the digital age (Edwards, 2019).

Fleer (2018) stated that there was no explicit agreement regarding the concept of digital play. However, Marsh et al (2016) states that the concept of early childhood play is found in the concept of digital play. The concept of digital play was explicitly put forward by Marklund (2020) that digital play is the use of digital technology by young children for learning purposes and digital play suggests a way of using digital technology that is similarly aligned and helps researchers and educators use digital technology for building knowledge (Edwards, 2019). The use of digital technology in the context of early childhood learning is by using technological devices such as applications, software, and cyber resources; the devices can be screen-based technology (computers, tablets, mobile phones, and interactive whiteboards), non-screen-based technology (projectors, cameras, and 3-dimensional printers), technological exploration devices such as digital microscopes, and digital toys such as robots, coding toys (bee-bot, Kubo and Osmo) (Undheim, 2022b).

3. Material and Method

In this research aims to review relevant litrerature regarding concept of digital play with the support of play theory and its influence on early childhood development. The methode used in this study was a scoping review using Preferred Reporting items for Sysytematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMAScr) checklist (Tricco et al., 2018). The design uses a number of question prepared using 5 of the 6 stages developed by Arksey and O'Malley (2005). The 5 stages are identifiying the research question, identifying relevant studies, study selection, data extraction, and collating, summarizing and reporting the results (Levac et al., 2010).

3.1 Design Study

The question in this research were prepared using spesific keywords using PICO. Researches used specific keywords which were arrenged according to the PICO framework (Population, Intervention, Comparison, Outcomne). PICO is a model for developing question that are structured to be relevant (Frandsen et al., 2020).

Table 1. Scoping Review Question

P	I	C	O
Early Childhood	• Theory of digital play • Digital play can influence children's development	• Lack of knowledge about concept digital play • Lack of knowledge digital play can influence children's development	• Theory of concept digital play • Digital play can influence children's development

3.2 Data Analysis

The literature search will include published studies. The database used are Google Scholar, Science Direct and Taylor & Francis Online Journal. Search for relevant articles using keywords in English dan Indonesians, namely: digital play for early childhood.

Literature selection was carried out by identifiying relevant articles using inclusion and exclusion criteria. The first screening of the title and abstract was with inclusion criteria, namely original research, english dan indonesian, published between 2016 – 2023, and complete article. The secind screening will be screened using exclusion criteria, namely articles reviews, prociding seminar, books and case report. The literature obtained will be selected using PRISMA flowchart.

The article selection process uses Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMAScR) (Tricco et al., 2018). PRISMA flowchart us an evidences-based minimun set of items for reporting in systematic reviews and meta-analyses. PRISMA flowchart (Fig.1) is considred appropriate to use because its use can improve the quality of publication reporting.

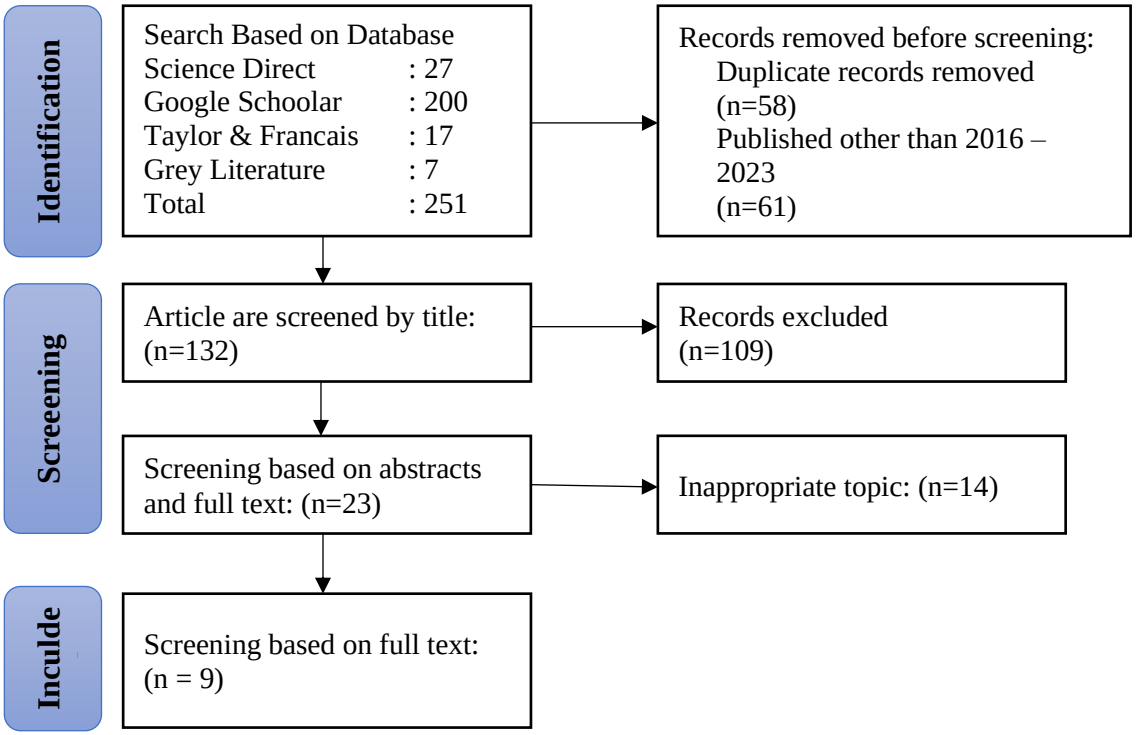

Figure 1 Research Model by PRISMA Flowchart

After the data extraction process on the 9 selected articles, it was continued to summaririzes with a qualitative description. The process on the 9 selected journal articles was carryout by filtering analysis, mapping and sorting material according to the main issues and themes by synthesizing related topics in relevan journal articles. This research examinies journals related to the issue of the digital play for early childhood.

4. Result

Search identification was carried out by serching for related articles in 3 databases, namely Science Direxts 27 articles, Google Schoolar 200 articles, anda Taylor & Francis Online Journal 17 articles. The total article are 251 articles. The eliminated in duplicate journals and other than 2016-20123 publication time period. Next, the articles were screened based on the title and abstract to form 23 articles. Then the last but not least screened based on the contents of the full text into 9 articles.

From the scooping review process, 9 selected articles were produced which were then compiled to find the chaarcteristics of the articles through data mapping. The study conducted discussed concept digital play for early childhood. This study also comapred the results of the analysis of the articles and reached a consensus through several discussion.

The result of 9 articles data extraction can be seen on the table 2. The types of journal are mostly early childhood education, learning, culture and social interaction, educational technology, proffesional learning and child-computer interaction.

Table 2. Data Extraction

Author / Year	Journal Type	Research Subject	Objective	Methode/ design	Conclussion
(Chu et al., 2024)	Child-Computer Interaction	Early Childhood	What is the characteristic knowledge base of the digital play literature concerning young children aged birth to eight years since the 2010 release of the Apple iPad, up to 2022	Literature Review	Key findings that represent the characteristic knowledge base of the digital play literature following the release of the Apple iPad. These include that: 1) digital play is only possible when children are afforded by access to working or non- working technologies; 2) there appears to be six distinctive features of digital play including learning and development, situated, interactive, enjoyable and entertaining, meaningful, and gendered; and 3) there remains concerns about the effects of digital play on young children particularly in relation to physical activity and addiction.
(Undheim, 2022b)	early childhood education research	Early childhood education and care (ECEC)	Esplore how young children (birth to six years old) and teachers together engage with digital technologies in early childhood	Literature review	Undhiem found the importance of defining digital technology in a board way. Teachers also can implement and embed digital technology inti their pedagogical practice. Last but not least Undhiem suggest that a more explicit focus on digital technology be embedded into pedagogical practice in national ECEC curricula, as

			education and care instutions		well as in national guidelines for EC teacher education.
(Mas' ud et al., 2022)	Early Childhood	Proffessional learning	Explore ability digital competence of early childhood in-service teachers	Qualitative	According of 4 core digital comptence dimension, early childhood in-service teachers in 1) Information dimension, the acquisition of teacher information needs has been effective. 2) In the communication dimension, this competency is intensely used, especially during a pandemic. 3) The dimensions of content creation, the ability to create and innovate content require a third party and 4) the dimensions of Safety and Problem Solving, teachers have an awareness of data protection and personal privacy.
(Marsh et al., 2021)	Early Childhood	Early Childhood Education	How far use of tablets and apps promoted play and creativity	Ethnography	The study has identified the most popular activities engaged in by under threes as they use tablets, has provided a range of new information about what apps they access and how they are used, and has outlined how these foster play and creativity. Secondly, the study indicated that tablets and apps can foster play and creativity in a number of ways, as the data illustrate. All types of play (apart from recapitulative and rough and tumble play) were identified in the case studies when children used tablets. Creativity in young children's use of tablets, as outlined in this paper, includes the use of expressive language, music and art, and the study has identified the extent to which apps that foster these areas

					feature in the lives of under threes. Thirdly, the study makes a contribution in terms of identifying the way in which tablets and apps engaged these young children in play holistically across cognitive (including linguistic),bodily/affective, social and cultural aspects of their development
(Fleer, 2020)	Learning, culture and social interaction	Early childhood	A study of children's participation in preschool activity settings where digital technologies were used, and where new technologies create new conditions for development	Qualitative	Findings show that digital play offered: new ways of presentingimaginary situations; the use of digital placeholder and virtual pivots for new action; doubleness of thinking in meta-imaginary play situations when digitally skipping in and out of play; and during investigations with digital devices, where the development of new conceptual thinking previously not possible in play, such as magnification, could happen. Through Hedegaard's model of child development and her concept of activity setting, the findings make a contribution to understanding how digital tools psychologically support children's development.
(Marklund, 2020)	Early Childhood Education	Proffesional learning	Investigates preschool teachers' perceptions about the pedagogical use of digital play and investigates how these perceptions are connected to the teachers' professional learning environment	Self-report essay and analyze using deductive approach	When introducing digital play into preschools, the challenges include too little time and reluctant parents and colleagues. The opportunities can be summed up as helping to prepare children for the future and enriching their upbringing and learning.
(Fleer, 2018)	Educational technology	Early Childhood Education	How psychological characteristics afforded when digital	Qualitative	The findings show that digital animation in a free-play program where role-play is featured can enrich the play opportunities of children

			play is introduced in a play-based program		which in turn promote play complexity and increase social and cognitive demands on children, which together can be theorized as a positive force for children's development. These developmental conditions emerged as a profile of five interrelated key digital practices and psychological characteristics, adding to our understandings of digital play.
(Edwards & Bird, 2017)	Early Childhood Education	Early Childhood	Asses A problem with technology use in early childhood settings is that little is known about how children learn to use technologies through play using digital play farmework	Deductive approach	Digital Play Framework holds potential for supporting educators to identify children's learning to use technologies through play and therefore opportunities for extending the provision of play-based technology education in the early years.
(Marsh et al., 2016)	Early Childhood Education	Early years	Access to and use of apps in the home, establish the most popular apps and identify the features of those apps that are successful in promoting play and creativity.	Mixed-Methode	In identifying play types that emerged in the analysis of data, the team utilised an established taxonomy, which outlines sixteen play types. This taxonomy was reviewed and adapted to analyse data from the project relating to digital play. Through this process, an additional type of play, transgressive play, was identified and added to the taxonomy. The paper outlines the implications of the revised taxonomy for future studies of play.

Source from (Edwards & Bird, 2017)

5. Discussion

A problem with technology use in early childhood settings is that little is known about how children learn to use technologies through play. There are theoritical orientation that can be used as a basis for establishing the hypothesis that children can learn through playing using technology. Furthermore, various studies have noted that the use of technology in early childhood can have a bad influence on children, but when used appropriately, it can actually

contribute to stimulating children's development. The explanation below explains this statement in depth.

Theoritical Orientation of Digital Play

Marsh et.al (2016) the results of his study stated that Hughes's taxonomy can be applied in a digital context. Marsh's study has also refuted Palmer's (2016) findings, which stated that digital games are not real play. Marsh's study represented by the 12 children aged between 3 to 5 use top ten their favorite apps (Minecraft, AR flash card and Temple Run App) of the during their normal activity at home recorded their own play through the use of a 'GoPro' chestcam.

The following is a conversion of Hughes' play taxonomy which is used to contain 16 types of play, namely symbolic play, rough and tumble, socio-drama, social, creative, communication, dramatic, locomotor, deep play, exploration, fantasy, imagination, master, object, role and recapitulation. However, if the taxonomy is converted to a digital context, it can only be applied to 14 types of play, 2 of which are not included in the digital conversion, namely playing rough and tumble and recapitulation. Rough and tumble games are associated with physical contact, and although there are virtual replications in digital play (Marsh, 2010), so this was not observed in this study. Recapitulation play is also a category of play that is difficult to differentiate because it often overlaps with other types of play, dan Hughes (2002) states bahwa this play occurs especially when children have access to nature. We concluded, conversion of Hughes' playing taxonomy in a digital context, it only contains 15 types of playing, which are presented in table form below:

Tabel 3 Play Types: adapted from Hughes (2002)

Play Type	Hughes' definition	Adapted for digital play
Symbolic play	Occurs when children use an object to stand for another object, e.g. a stick becomes a horse	Occurs when children use a virtual object to stand for another object, e.g. an avatar's shoe becomes a wand
Socio-dramatic play	The enactment of real-life scenarios that are based on personal experiences, e.g. playing house, going shopping	The enactment of real-life scenarios in a digital environment that are based on personal experiences, e.g. playing house, going shopping. This could take place through play with avatars, or by imagining that an on-screen virtual character is involved in such play off-screen
Social play	Play during which rules for social interaction are constructed and employed	Play in a digital context during which rules for social interaction are constructed and employed
Creative play	Play that enables children to explore, develop ideas and make things	Play that enables children to explore, develop ideas and make things in a digital context
Communicatio n play	Play using words, songs, rhymes, poetry, etc.	Play using words, songs, rhymes, poetry, etc. in a digital context. Can include text messages, multimodal communication and so on
Dramatic play	lay that dramatises events in which children have not directly participated,	Play in a digital context that dramatises events in which children have not directly

	e.g. TV shows	participated, e.g. TV shows. This could take place through play with avatars, or in chat rooms, etc.
Locomotor play	Lay which involves movement, e.g. chase, hide and seek	Virtual locomotor play involves movement in a digital context, e.g. child may play hide and seek with others in a virtual world
Deep play	Play in which children encounter risky experiences, or feel as though they have to fight for survival	Play in digital contexts in which children encounter risky experiences, or feel as though they have to fight for survival
Exploratory play	Play in which children explore objects, spaces, etc. through the senses in order to find out information, or explore possibilities	Play in a digital context in which children explore objects, spaces, etc. through the senses in order to find out information, or explore possibilities
Fantasy play	Play in which children can take on roles that would not occur in real life, e.g. be a superhero	Play in a digital context in which children can take on roles that would not occur in real life, e.g. be a superhero. This could be through the use of an avatar, but may also include taking on a character off-screen whilst they engage in on-screen activities in the fantasy scenario
Imaginative play	Play in which children pretend that things are otherwise	Play in a digital context in which children pretend that things are otherwise
Mastery play	Play in which children attempt to gain control of environments, e.g. building dens	Play in digital contexts in which children attempt to gain control of environments, e.g. creating a virtual world
Object play	Play in which children explore objects through touch and vision. They may play with the objects	Play in which children explore virtual objects through vision and touch through the screen or mouse. They may play with the virtual objects
Role play	Play in which children might take on a role beyond the personal or domestic roles associated with socio-dramatic play	Play in a digital context in which children might take on a role beyond the personal or domestic roles associated with socio-dramatic play. This could be through the use of an avatar, or they could take on a role themselves as they engage in on-screen activities

Adapted by Marsh et al (2016)

The second theory is The Digital Play Framework (2015) theorizes digital technologies as cultural tools (Vygotsky, 1997). According to the Digital Play Framework, technologies are tools that children master through what Hutt (1966) defined as ‘epistemic’ or exploratory play prior to moving into ‘ludic’ or symbolic play. Vygotsky (1997) argues that using a tool helps people achieve an object of activity. In early childhood education settings, play often forms the object of children’s activity (Wood, 2013). Hutt (1966) argued that children play with artefacts in an exploratory way (epistemic play) until they have mastered what the object does. Their activity then moves into being ‘ludic’ or symbolic play because instead of trying to understand the functions of an artefact, children use the artefact in innovative ways to realize their own

goals. Because Vygotsky argued that mastery of a tool changes the object of activity, we have argued in our construction of the Digital Play Framework (Bird & Edwards, 2015) that children learn to use technologies through play by moving from epistemic to ludic play. This study represented by the children's use of the digital devices during the course of their normal kindergarten activity over a period of 5 weeks. The devices used by the children included digital still and video cameras, iPads and a computer. Here digital play framework that used for study.

Table 4 The Digital Play Framework

Object of activity	Behaviours from (S. J. Hutt et al., 1989)	Indicator	Description
Epistemic play	Exploration	Seemingly random use of the device	Seemingly random footage, images, pressing the iPad, moving or clicking the mouse
		Locating the operating functions of the device	Locating the on/off button (video camera), shutter button (still camera), home button (iPad), keyboard (computer) or mouse (computer)
		Exploring the operating functions of the device	Exploring the on/off button (video camera), shutter button (still camera), home button (iPad), keyboard (computer) or mouse (computer)
		Following directions of the device or other people	Following the directions of the device or other people
		Seeking assistance for desired outcome	Asking adults or peers for assistance to use the device
	Problem Solving	Relating actions to the response/ function	Pressing the on/off button, relating turning the camera to what is in the view finder (video camera), pressing the shutter button, relating turning the camera to what is in the viewfinder, pressing the Home button to change Apps, scrolling through Apps (iPad), relating mouse and keyboard to actions on the screen (computer)
		Trying different actions to solve an issue	Returning to the menu button; asking peers or adults for advice/help
		Intentional use of the operating functions	Selecting record functions to create footage
	Skill acquisition	Intentional and deliberate use of functions for desired outcome	Being able to view taken footage (video camera) or images (still camera), scrolling and tilting (iPad), using mouse to move cursor, click and double click program icons (computer)
		Sharing learned actions with others	Being able to share knowledge of functions of he device with others for the purpose of teaching others (ZPD)
		Intentional and controlled footage of observable people, events and situations or manipulating	Creating and filming deliberate play Scenarios

		the App or program for own purpose	
Ludic play	Symbolic	Deliberate use of device for pretend play	Using the device to record already established pretend play or to record re-enacted play (video and still cameras), selecting an App specifically for pretend play (iPad), selecting a program specifically for pretend play (computer)
	Innovation	Creating pretend play deliberately for use of the device	Creating a pretend play to record (video or still cameras), selecting an App specifically for pretend play (iPad), selecting a program specifically for pretend play (computer)

Source from (Edwards & Bird, 2017)

Following these two theories can concluded that based on the type of play that previously could be used in physical (non-digital) games in the early childhood learning process and can also be used in learning through play using technology known as digital play, even the digital play framework can be used to observe and assess young children learning through play when use technology.

Digital Play Can Stimulate Child Development

Fleer (2020) using Hedegaard's cultural-historical model of child development to asses children's participation in preschool activity settings where digital technologies were used. One example of the subject researched by Fleer, was a child playing with bathing a doll and one of his friends photographed the activity, then after that they looked at the results of their photos together and they repeated the game of bathing the doll by imitating what was caught on camera. This setting, the children filming their imaginary play situation and the digital device support the children's play (Fleer, 2020). Fleer stated that it is similar to Vygotsky's example of two sisters who role-play being sisters, and make conscious the rules and roles associated with sisterhood, video and re-playing imaginary play, also makes conscious the rules and roles associated with the imaginary situation of camping or bath play. This is a new practice for children that afford new ways of acting and thinking about their play (Fleer, 2017). Imaginary play can give many different developmental area, such as science, technology, communication, and creativity (Utami, 2020).

Teacher Readiness to Support of Digital Play

There are five dimensions of digital competency that a person must have in the field of education, namely information, communication, content creation, safety and problem solving (Galindo-Domínguez & Bezanilla, 2021). Mas'ud et al (2022) found in early childhood's teacher of Indonesia setting that Basically, all four digital competencies of in-service early childhood education teachers are possessed. In the information dimension, teachers' information needs have been effective, but the ability to adapt and modify learning resources to be applied in the learning process has not been achieved, teachers tend to completely follow the sources they get from digital media without making any efforts to modify them to suit their

needs. Continuing with the Communication dimension, due to the effects of the pandemic, this dimension is used intensively by teachers. In the content creation dimension, teachers still need to develop these competencies in terms of creating and innovating learning content independently. Finally, in the Safety and problem solving dimension, teachers have awareness of data protection and personal privacy and how to take preventive action. However, development of teacher's digital competence found the challenges include too little time and reluctant parents and colleagues. The opportunities can be summed up as helping to prepare children for the future and enriching their upbringing and learning (Marklund, 2020)

6. Conclusion, Implication, and Recommendation

This study makes a significant theoretical contribution, particularly therotical framework of play when child use technology as learn through play (digital play). Digital play is true play because according to theory of play, Hughes' taxonomy play and Edwards & Bird's digital play framework can also used for digital play concept. For teacher's side, teacher still need time and reluctant parents and colleagues to develop their digital comptence.

7. Acknowledge (if any)

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9. Appendix (if any)

This section should be placed at the end of the manuscript after the reference list.