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# Vietnamese pre-schoolers' tablet use and early childhood learning: an ecological investigation

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# Vietnamese pre-schoolers' tablet use and early childhood learning: an ecological investigation

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**ABSTRACT**

As Vietnam's economic growth and consumer demands continue to accelerate, more Vietnamese families are now able to acquire portable touchscreen devices such as iPads. Previous research has shown that the use of touchscreen devices can benefit pre-schoolers' learning, especially within school and home settings. However, little is known about the broader sociocultural environment within which such technology adoption by families with pre-schoolers takes place, especially in the Global South. Guided by Bronfenbrenner's ecology of human development, this research investigates the ecology of tablet use and early childhood learning by pre-schoolers in Vietnam through an ethnographic investigation of 42 mother-child dyads. We found that Vietnamese pre-schoolers' tablet use for the purpose of early childhood learning was initiated, sustained or even enforced by their parents. Vietnamese mothers strongly regard tablets as learning tools that give their children a distinct edge in educational achievement. However, such enthusiastic appropriation of the tablets was not matched by the mothers' concomitant understanding of the benefits and risks of touchscreen devices for children, nor the availability of social scaffolding structures for the parents.

## Introduction

### Research focus

Children of increasingly younger ages are using handheld touchscreen devices such as tablets and smartphones. These devices have acquired mass appeal due to their portability, highly interactive features and simple user interfaces. In 2015, Ofcom found that children aged 3 to 11 in the UK most frequently used tablets to access the Internet (Ofcom, 2015). A survey of Southeast Asian parents found that 98% of them allowed their children aged 3 to 8 to use a smartphone and/or a tablet (TheAsianparent Insights, 2014).

Previous research has shown that the use of touchscreen devices can benefit pre-schoolers' learning, especially within school and home settings (Neumann, 2014; Schacter & Jo, 2016). However, little is known about the broader sociocultural environment within which such technology adoption by families with pre-schoolers takes place. Guided by

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**Table 1.** Observation notes for S36 and her 5-year-old son.

| Child-device interactions | Device & time | iPad, 15min |
|---|---|---|
| | Activities on the device | Practising math skills through an app (encouraged by the parents), watching Doraemon videos on YouTube (by himself) |
| | What the child does on the tablet | The child knows what he is looking for, touches the screen at moderate speed. |
| | | The parents sit beside the child, trying to encourage him to use a maths app for the first half of the observation session, but the child prefers YouTube so he switches to YouTube after that. |

Bronfenbrenner's ecology of human development (1979), this study investigates the ecology of tablet use and early childhood learning by pre-schoolers in Vietnam through an ethnographic investigation of 42 mother-child dyads. Specifically, it focuses on Vietnamese pre-schoolers' use of tablet devices in learning and how such device use is influenced by various factors within the micro-, meso-, exo- and macrosystem levels. We define pre-schoolers as children aged 3 to 5 who yet to enter primary school.

## Bronfenbrenner's ecology of human development

Bronfenbrenner's ecology of human development (1979) theorises that children's development is shaped by nested, concentric structures that they live in: the microsystem, mesosystem, exosystem and macrosystem. They are interconnected in a way that one system is contained within the next like "a set of Russian dolls" (p. 3) (see Figure 1).

A *microsystem* is defined as the activities, roles and interpersonal relations experienced by children in settings such as homes and childcare centres that most directly affect them. Roles are the activities and relations expected of children within this microsystem, of others in relation to children and based on the *degree of reciprocity, balance of power* and *affective relations*. For instance, parents are expected to provide guidance to children, and children are expected to accept such guidance with high reciprocity, mutual affection, and greater authority from parents. A *mesosytem* is a system of interrelated microsystems that connect children beyond their immediate settings and in which children actively participate, or that involve other people who participate in interrelated settings, or communications among



**The child**

Microsystem (*home, childcare centre, etc.*)

Mesosystem (*interconnections between home & school, parents & teachers, etc.*)

Exosystem (*parents' employment, social networks, etc.*)

Macrosystem (*cultural & social contexts*)
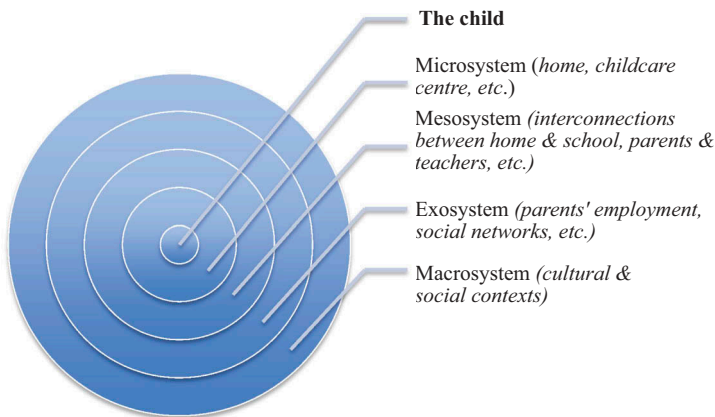
**Figure 1.** Bronfenbrenner's ecology of human development.

settings. For example, the interconnections between children's home and school where children act as the *primary link*, parents and teachers act as *supplementary links* as they may engage in *intersetting communication* to form *intersetting knowledge*. An *exosystem* comprises settings that do not directly involve children but still affect them, such as their parents' employment situations and the family's social networks. The *macrosystem* is the overarching cultural and social contexts with underlying belief systems encompassing the lower-order micro-, meso- and exosystem, and affects children most indirectly (Bronfenbrenner, 1979).

While Bronfenbrenner's framework of concentric structures has offered significant analytical purchase, various refinements have been proffered by other scholars. Kotchick and Forehand (2002) noted that factors outside the family shaping parenting practices and child development were not well explored. In particular, they identified three contextual factors as requiring more attention: ethnicity/culture, family socioeconomic status, and neighbourhood/community context. Similarly, "*Parenting: An Ecological Perspective*" (Luster & Okagaki, 2005) was guided by Bronfenbrenner's ecological perspective (1979), and examined a more wide-ranging number of determinants that pose opportunities or constraints for parenting. They identified determinants such as parents' characteristics (social cognitions, personality, developmental history, age, gender), children's characteristics (age, temperament, gender, needs), and contexts (the marital relationship, social networks, socioeconomic status, parents' employment, intervention programmes).

Despite the comprehensiveness of Bronfenbrenner's framework, and its pertinence to children's media use within the home, it has not been extensively applied to understanding the same. Indeed, extant research has largely omitted to examine the confluence of forces that have impact on children's media use (Jordan, 2004). Prior research has found that even when factors influencing children's television viewing time in the home ecology are quantified, they may not predict well across families of different ethnic groups (Jordan et al., 2010). Bronfenbrenner and related scholars have not written much about the media in the different systems, and one challenge of the ecological perspective is how to isolate key forces while acknowledging and connecting the different systems (Jordan, 2004).

Warren (2006) sought to address this very issue by classifying different predictors of parental mediation of children's media use according to Bronfenbrenner's systems. At the microsystem level are children's age and parental involvement. At the mesosystem level are parents' television viewing experience and attitudes. At the exosystem level is parents' employment. At the macrosystem level are mothers' expected gendered role as the primary caregiver to children, ethnicity, parents' income and education that accrue towards cultural capital for children. Collectively, such extant research offers useful enhancements of Bronfenbrenner's ecological theory which can serve as a productive analytical framework by which to understand parental mediation of children's media use.

## Vietnam's mobile media landscape

The enhanced ecological framework can thus be applied to understanding parental mediation of children's tablet use in Vietnam, alerting us to salient factors to consider in each structure within the ecology. On the macrosystem level, it is crucial to understand the mobile media landscape in Vietnam to better contextualise our research aims and findings.

Although Vietnam has a chequered history involving military conflict, political unification and other social upheavals, the country has experienced rapid growth since the ruling government implemented the economic reform policy Đổi Mới in 1986. In 2016, Vietnam's GDP growth rate was a healthy 6% (The World Bank, 2017). It is in this climate of robust economic growth that Vietnam's new middle class has strongly emerged. Their aspirations include upward social mobility through the acquisition of wealth and conspicuous consumption. Indeed, consumerism has become a potent indicator of social status, creating new social divisions and hierarchies in the country (Earl, 2014).

With the rise of the middle class, Vietnam's consumer goods markets have rapidly expanded. The consumer electronics market has thrived with more competitors, thus ushering in declining prices of devices and making smartphones and tablets omnipresent within Vietnamese households. In 2016, 14 million smartphones were sold (Minh & Duy, 2017) to a population of 92 million (The World Bank Data, n.d.). Within the first half of 2015, 582,000 tablets were sold – a 34.4% increase from 2014–76% of which cost less than USD $300 (Nguoi Dong Hanh, 2015). Vietnam's toy market is bearing the brunt of growing tablet ownership as toys can no longer compete with touchscreen devices for young children's attention (Brands Vietnam, 2015). The cost of Internet services has also dropped and Internet penetration was estimated to be around 45% (Thanh Nien News, 2016).

The mobile devices that dominate Vietnam's electronics market are largely by foreign manufacturers, with the top three best-selling brands being South Korea's Samsung, China's Oppo and the US's Apple, collectively accounting for 60% of the mobile market share in 2016 (Minh & Duy, 2017). Samsung and Oppo launched aggressive marketing campaigns featuring local celebrities (Minh & Duy, 2017), while Samsung was reported to invest more than US$14 billion and employ more than 100,000 workers in Vietnam (Mansharamani, 2015). With strong competition from these foreign electronics giants, Vietnamese tablet manufacturers have thus attempted to target the lower-income segment with their wares, although many rivals from China have also entered the scene (Vietnamnet, 2017). However, this growing adoption of mobile devices amid aggressive market penetration has not been accompanied by a corresponding increase in public education efforts to guide and inform Vietnamese parents of the use of such devices by children. We undertook a review of existing Vietnamese online public education materials on children's touchscreen device use and found them to be sorely lacking, save for some local media reports on the benefits and risks of such device use. Furthermore, the local media primarily cite sources and research findings from other countries when dispensing advice to Vietnamese parents, most probably due to the paucity of research in the local context (see for example Alo Bac Si, 2015; Dan Tri, 2015b; Tuoi Tre Online, 2015). Hence, part of our research focus is guided by the underlying question: with the growing diffusion of touchscreen devices in Vietnam, what kinds of public education have Vietnamese parents received, if at all, on effectively managing their children's tablet use?

## Parenting culture and the importance of education in Vietnam

Another macrosystem factor is Vietnam's parenting culture. Influenced by Confucianism, the traditional Vietnamese family is highly patriarchal. Vietnamese children tend to be closer to their mothers because the child-rearing task mainly rests on mothers (Locke,

Nguyen, & Nguyen, 2012). Children are expected to fulfil their family roles and to uphold the family's honour rather than to satisfy their own desires, to obey their parents' authority, and to avoid loss of face for the family; parents are in turn expected to ensure that their children are educated, develop sound morals and protected from social evils (Mestechkina, Nguyen, & Shin, 2014).

The topic of pre-schoolers' early childhood learning is highly pertinent to Vietnam as a significant proportion of the household income is spent on children's education at every developmental stage. Indeed, Vietnamese culture greatly emphasises the importance of education. As with many other Asian societies, Parents make sacrifices for children's educational opportunities so that children can gain social respect and mobility (Mestechkina et al., 2014). Notably, wealthy Vietnamese parents send their children overseas for academic pursuits, spending USD$1.8 billion on this endeavour in 2013 (Dan Tri, 2015a). The pressure for the child's academic achievement is pronounced, with both parents and children – and even teachers – experiencing stress in this regard (Tuoi Tre News, 2014b). Many Vietnamese parents send children as young as in pre-school to private tutoring classes, also known as "học thêm", although such shadow education has been banned by Vietnam's Ministry of Education and Training (Tuoi Tre News, 2014b).

Children's learning of English is another prime concern among Vietnamese parents. Many Vietnamese students start to learn English in elementary school or even kindergarten because of the premium placed on English language ability in children. But due to rote-oriented testing methods that focus mainly on grammar and reading comprehension, many students fail to use English in daily life (Viet Toan, 2013). It is common for more affluent Vietnamese parents to enrol their children in English classes in private centres to help them gain a better command of the language. Such strong demand is also reflected in the fact that in 2013, there were over 700 registered private English centres in Ho Chi Minh City alone (Vietnamnet, 2013).

## Literature review and research questions

### Pre-schoolers' touchscreen device use, early childhood learning and the roles of parents

In light of the growing popularity of touchscreen devices worldwide, there is growing research evidence on pre-schoolers' touchscreen device use and its effects on their early childhood learning at school and home, including drawing skills, early science skills, and emergent literacy skills. For example, Couse and Chen (2010) found that pre-schoolers in the US were comfortable drawing with tablets after some instruction from teachers, and still persisted with their tablet use despite technical difficulties. Tablet interventions at school through educational apps for pre-schoolers in the US and UK were found to contribute to immediate and sustained learning gains in maths, especially for low-performing children (Outhwaite, Gulliford, & Pitchford, 2017; Schacter & Jo, 2016). In the home setting, Formby (2014) found that pre-schoolers in the UK who read stories using both print and touchscreen media scored lower but enjoyed reading more than those who only read print. Australian pre-schoolers with greater access to tablets at home were found to demonstrate stronger letter sounds and name writing skills (Neumann, 2014). In fact, the educational benefits from children's computer use has

long been acknowledged, and the question is not whether computers can be effectively used, but whether they can facilitate children's learning in ways consistent with their development (Clements & Sarama, 2003). Indeed, the investigation of pre-schoolers' touchscreen device use should not simply consider whether it is beneficial to early childhood learning, but also question what meanings such device use signifies, in what contexts, and how it can be better informed and regulated. As we will later explain, the present study will seek to address these dimensions.

As pre-schoolers are still highly dependent on their caregivers, their touchscreen device use tends to be heavily influenced by their parents and parenting practices. Pre-schoolers still spend much of their time at home rather than at childcare centres or kindergartens, and have yet to form strong relationships with peers. The important roles that parents play in their children's media use have thus been extensively examined through a large body of research focusing specifically on the home setting. Parental mediation theory posits that parents adopt three main types of mediation strategies: restrictive mediation (controlling children's media use by setting rules), active mediation (actively discussing media content with children) and co-viewing (watching media content with children) (Nathanson, 2001). Parental mediation theory is deeply rooted in television viewing, and has been widely applied to research on children's television viewing, video game playing and Internet use (Nikken & Jansz, 2006), but has not focused on children as young as pre-schoolers and their touchscreen device use. Parental mediation research has also been concentrated in developed countries in the global North with a few notable exceptions (see Livingstone, Lim, Nandi, and Pham, inpress).

Research on parental mediation in other parts of the world still has much potential for development. In the case of Vietnam, there is an urgent need for research attention on children's media use as the few existing studies conducted so far are highly descriptive and statistically driven. For instance, a survey in Vietnam found that 19% of children under 3 and 59% of children aged 3 to 5 used tablets and smartphones from 30 to 60 minutes per day, and that Vietnamese parents did not have sufficient knowledge to monitor their children as they relied on intuition or habits, but did not delve into the causes or meanings of such data (Tuoi Tre News, 2014a).

For this study, we wish to go beyond the scope of just the school or home environment which has been well explored by existing literature on pre-schoolers' tablet use and early childhood learning, but we do not aim to extend parental mediation theory to the context of pre-schoolers' tablet use. Instead, we seek to examine the broader ecology of pre-schoolers' tablet use and early childhood learning in Vietnam to take into consideration the different factors, interactions and settings (which undoubtedly will involve the roles of pre-schoolers' parents) at both micro and macro levels using Bronfenbrenner's ecology of human development as the framework (1979).

## Research questions

Hence, we seek to address four research questions:

RQ1: How do microsystems (such as the home and school settings) influence Vietnamese pre-schoolers' tablet use to develop their early childhood learning?

RQ2: How does the mesosystem (such as the interconnections between the home and school settings) influence Vietnamese pre-schoolers' tablet use to develop their early childhood learning?

RQ3: How do exosystems (such as the family's social networks) influence Vietnamese pre-schoolers' tablet use to develop their early childhood learning?

RQ4: How does the macrosystem (such as Vietnam's cultural and social contexts) influence Vietnamese pre-schoolers' tablet use to develop their early childhood learning?

## Methodology

We employed two qualitative research methods: semi-structured, face-to-face interviews, and observations with note-taking and photo-taking, for which institutional ethical approval was sought and granted. The first part of the research was an interview with the pre-schooler's mother lasting 50 to 75 minutes, followed by an observation session of the pre-schooler's tablet use in the mother's presence for 10 to 15 minutes in their own homes. This allowed us to observe the home environment and the natural setting in which pre-schoolers typically use digital devices. The child was not expected to be present during the interviews with the mothers but if the child happened to be around, his or her speech would also be captured. As mothers bear more responsibility for child-rearing in the patriarchal Vietnamese family (Locke et al., 2012), mothers were chosen as interviewees over fathers. Nevertheless, we would capture the father's input if he happened to be present during the interview and interjecting.

During the interview, the mother was asked about herself, her household, her acquisition of the tablet device, her views on the media, the child's daily activities and patterns of using tablets and other forms of media at home and at school, the roles of other people or social factors influencing the child's tablet use, and any other topic that became salient as the interview progressed. Meanwhile, the researcher also took observation notes of the home environment, the availability of media devices, the mother's non-verbal cues, the child's activities and the mother-child interactions. The interview was recorded with an audio recorder and ended with an "apps-ploration" exercise (Lim, 2017) in which the mother was asked to show the researcher the tablet's contents, including the different apps used by the child and their motivations for installing them. Observations were also made of the physical environment of the home, with special attention paid to locations in the home where the tablet was stored and used by the child, the child's play areas and his/her favourite toys. Photographs of the apps and the home were also taken.

In the second part of the research, the researcher observed the child's interactions with the tablet device and/or mobile phones in the mother's presence and took notes of the child's activity on the devices, the child's spoken words, the apps used, the amount of time the child spent on each device and the mother's responses. The researcher would talk to the mother and the child to probe when necessary. Photographs of the mother and child during the observation session were taken from an angle to prevent facial recognition. Upon completing the research, each mother-child dyad was

reimbursed with a 400,000VND (USD$17.6) grocery voucher that could cover the cost of approximately half a week's groceries for the average Vietnamese family.

The research was fully conducted in Vietnamese by author A and four Vietnamese research assistants from August to September 2016 in the Ho Chi Minh Metropolitan Area in the South of Vietnam. Purposive and snowball sampling methods via personal networks were used to recruit 42 mother-child dyads. The interviews were simultaneously transcribed and translated from Vietnamese to English by author A, or first transcribed into Vietnamese by the research assistants and then translated into English by author A to ensure consistency in meaning. The observation notes and interview transcript for each mother-child dyad were consolidated into a short narrative to facilitate our understanding of their media use and contexts. The data analysis involved identifying dominant themes and issues from the interviews and observations.

## Findings and discussion

### Vietnamese pre-schoolers' households and tablet use

A middle class household in Vietnam earns at least 20 million VND (USD$880) per month (Tuoi Tre Online, 2016). The typical Vietnamese household in this study was of a lower socioeconomic status (with a monthly household income below 20 million VND), owned one television, one tablet and two smartphones. Alongside the popular iPad and Samsung Tab, more affordable tablet brands such as Acer, Asus and Masstel were used in many households. They accessed the Internet through WiFi installed at home with a monthly fee ranging from 100,000VND to 300,000VND (USD$4.4 to $13.2) which they considered acceptable.

The Vietnamese pre-schoolers were exposed to tablets or smartphones by their parents when they were as young as 6 months old, and used tablets more proficiently when they reached 2 or 3 years old. The interviewed mothers confirmed that they supervised their children's tablet use more than the fathers did mainly due to Vietnam's gender role expectations. Most of the children went to childcare centres or kindergartens, while younger ones stayed at home. The pre-schoolers' duration of usage varied greatly across families, from as little as 15 minutes to as much 3 hours per weekday, typically after they had returned home from school or when they had their meals. This range increased to 2 to 7 hours per day during weekends and holidays. Although the pre-schoolers often used the tablets interchangeably with the smart television[1] or older family members' smartphones, the tablets were still preferred by the children thanks to their larger screens and portability, and by the parents because they did not contain their private or work-related information. YouTube was the most popular app, followed by games and educational apps. Although some of the children's pre- schools had smart televisions in class, none of them had access to or incorporated touchscreen devices into their teaching.

### Microsystem influences

A microsystem comprises the activities, roles and interpersonal relations experienced by children in a setting such as the home and childcare centre, which directly affects them the most (Bronfenbrenner, 1979). At the microsystem level, parental supervision was

a key factor influencing Vietnamese pre-schoolers' use of tablets for learning. In the school setting however, tablets and smartphones have not been formally incorporated into Vietnam's early childhood education.

Given their young age, immaturity and lack of independence, the pre-schoolers' exposure and access to the tablets and their content at home were dictated by their parents most of the time. Under Bronfenbrenner's definition of macrosystem (1979), the parents and pre-schoolers assumed their typical familial roles in interpersonal interactions: the parents were unequivocal authority figures and provided supervision and guidance regarding device use to their children who were accordingly expected to comply. While some mothers made it known that the tablet was the child's exclusive possession, other mothers made it clear that the tablet belonged to them and was shared with the child on occasion. Regardless, almost all the children had to seek their mothers' permission to use the tablets and for how long. In instances where the child threw tantrums and bargained for more tablet time, mothers sought to assert their authority more firmly:

> "[If she wants to sit there crying or acting like she does not hear me], I just let her be. If she wants to do that, she can do that. I already decided to not let her use the tablet anymore."
> S19, mother of two girls aged 4 and 7.

Unsurprisingly, the pre-schoolers' use of the tablet for learning was largely influenced by their parents' supervision of the accessed content. Both the mothers and fathers had high expectations of their children's ability to acquire knowledge through the tablets, and expressed pride and joy if their child demonstrated such progress. Generally, the mothers commented or even lamented that their children were much more engrossed in entertainment such as game apps or cartoon videos on YouTube. Instead they preferred that their children view educational content such as educational YouTube videos, or apps for learning basic languages (Vietnamese, English), simple logical thinking (maths, puzzles), and basic knowledge about the world (numbers, shapes, colours, animals), or drawing and storytelling apps. Our apps-ploration of the pre-schoolers' tablets showed that the educational apps used varied highly across different mother-child dyads, and tended to be downloaded by the mothers or fathers before being introduced to the children. The measures undertaken by the mothers to guide their children towards educational content also differed in levels of strictness. Some mothers shared that they simply screened educational YouTube videos for their children to help them acquire knowledge. If the children did not want to watch the videos, they would not press further. Some stricter mothers required their children to be more involved in learning through tablets. These mothers would ask the children to use educational apps and practise some skills in their presence so that they could give advice and encouragement when necessary. S36 and her 5-year-old son were one such example (see Table 1 and Figure 2), as shown in the extracts of the recording and researcher's notes during the observation session below:

| | |
|---|---|
| Researcher: | Can you help me open the apps? |
| S36's husband: | Show her the math app thing! |
| S36: | These numbers are very tough! This one is easier. Do the math for auntie [researcher] to see! 5 plus 4? Correct! Like that. |
| Child: | [mumbling to himself] |
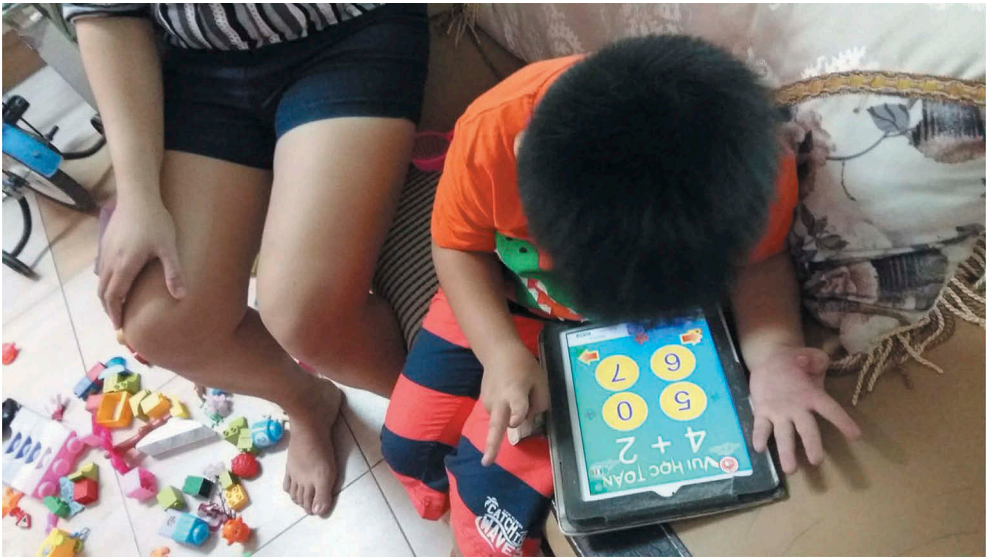
**Figure 2.** S36 encouraged her 5-year-old son to interact with a maths app during the observation session.

Some mothers were so strict that they would not permit the installation of any game apps in the tablets at all, while some mothers deliberately hid the tablets to prevent their children from using them because the children did not engage in educational activities as they originally wished:

> "When I first bought [the tablet], my husband and I just wanted to play English songs so that [our son] could learn English [..]. But he was unable to key in the search words and ended up opening any videos to watch and played games [..]. Recently I hid [the tablet]from him, I don't allow him to play anymore." S4, mother of two boys aged 1 and 5

Clearly, within the small setting of the Vietnamese home at the microsystem level, the parent-child hierarchy determined that the parents set the tone in terms of how the tablets were used, with a strong preference for "productive" uses such as learning apps and educational videos. In other words, given their tender age, the pre-schoolers' tablet use in early childhood learning was initiated, sustained and enforced by their parents.

As well-intentioned as it might be, the Vietnamese parents' enthusiasm for the educational value of tablets was not matched by their concomitant understanding of the benefits and risks of employing tablets in early childhood learning. First, according to Kong (2017), besides purchasing media devices and encouraging their children to learn through devices at home, parents should regulate the children's device use and set reasonable expectations to achieve meaningful learning outcomes. Touchscreen devices have been widely used in early childhood education in North America and Europe since the early 2010s, with lively and well-advanced debate among scholars and practitioners. However, in many other developing parts of the world such as the Global South of which Vietnam is a part, concepts of digital literacy and the use of digital technologies for learning are still in their infancy. Even within the Southeast Asian region, Vietnam lags behind more developed countries such as Singapore, Thailand and the Philippines in its investments in digital and educational infrastructure (Livingstone et al., inpress;

Neumann, 2014). As touchscreen devices had not been incorporated into Vietnam's early childhood education at the time of this research in late 2016, the Vietnamese pre-schoolers' tablet use mainly took place in the informal setting of the home, under the parents' subjective guidance, and without evidence-based advice from more authoritative sources such as public agencies or professionals in the healthcare or education sectors. In the absence of such advice, the Vietnamese mothers had wildly varying, and sometimes unrealistic expectations of the educational value their children could distil from tablets. For example, S40 cheerfully shared that her 3-year-old daughter picked up basic English words such as "father" and "mother" verbally from her tablet, while S5 took great pride in how her 4-year-old boy could already read Vietnamese in long sentences thanks to an app teaching Vietnamese. While such enthusiasm was understandable, the blind faith the parents placed in the transformative potential of these apps was of concern because the parents could end up setting unrealistic learning goals for their young children.

Second, many Vietnamese mothers expressed concerns about the potential negative effects of tablet use on their children that resonated with past literature, such as excessive use, eyesight deterioration, a sedentary lifestyle and exposure to inappropriate content (see Kong, 2017). Hence they tried to restrict their children's tablet use especially when non-educational content was involved. However, different mothers had different conceptions of what constitutes unhealthy use of tablets. For instance, some mothers would rather let their children watch television than tablets, or choose tablets over smartphones because they reasoned that bigger screens meant less vision deterioration, even though the content the children accessed from the smart television, tablet and the smartphone was essentially the same. In another instance, some mothers mentioned the word "radiation" with hints of anxiety, albeit without knowing what "radiation" meant, from which devices they were emitted, or how it would affect their children, if at all.

To the best of our knowledge, there has been no scientific evidence supporting or rejecting such beliefs that seem to be grounded in lay-person reasoning. Hence, such subjective or speculative understanding of the adverse effects of tablet use, and ways to counter the same, should receive more research attention as they do influence parents' supervision efforts, even though these clearly need to be more firmly grounded in evidence-based claims.

## Mesosystem influences

A mesosystem encompasses interrelated microsystems that connect children beyond their immediate settings, or involves other people who participate in interrelated settings, or communications between settings such as the interconnections between the home and the school (Bronfenbrenner, 1979). We found that the interconnections between the Vietnamese pre-schoolers' home and school settings existed, but mainly through the inter-setting communication between their parents and teachers who acted as supplementary links, rather than through the pre-schoolers themselves who were primary links. This was understandable given the pre-schoolers' young age and limited verbal ability. The parents reported that they were generally concerned about their children's studies at school and often actively visited their classes or talked to their teachers. Although the

parents were highly concerned about the effects of their children's tablet use at home, the majority of the parents did not receive any relevant advice from their children's schools or teachers. This was unsurprising since touchscreen devices had not been adopted by early childhood educators in Vietnam. Only one mother was warned of excessive tablet use by her child's teacher at a parent-teacher meeting, and another mother was asked by her child's teacher to restrict the child's tablet use because during class activities, the child kept mentioning the fictional characters he watched at home.

Children have more developmental potential in different settings in the mesosystem if their role demands are compatible (Bronfenbrenner, 1979). In other words, for tablets to fully support Vietnamese pre-schoolers' learning, the optimal solution is for the device to be used both at home and at school for the same purpose. Kong (2017) also noted the crucial role schools should play in addressing potential negative effects of children's device use because even though parents may have such concerns, they may not have the requisite technological literacy skills to effectively manage their children's e-learning at home. Indeed, many parents in our sample admitted that they were not very media competent and often relied on their own observations or intuition to supervise their children's tablet use. Unfortunately, the much-needed guidance and advice from schools and teachers for parents remained sorely lacking in the Vietnamese context.

In brief, at the mesosystem level, there was an absence of interactions between the parents and teachers regarding the children' tablet use at home. This exacerbated the inconsistency in expectations between the parents and the teachers in Vietnam and undermined parents' understanding of early childhood learning through tablet use, which could intensify the principal but possibly problematic role that parents play in supervising their children's tablet use. The parents' blind emphasis on the tablets' educational value given their subjective and naïve understanding of its benefits and risks were also not moderated by the educators in the mesosystem .

## Exosystem influences

An exosystem does not directly involve children but still affects them, such as the family's social networks (Bronfenbrenner, 1979). Our data showed that the family's social networks had some second-order effect influences on Vietnamese pre-schoolers' access to and use of tablets to develop early childhood learning. A second-order effect (Bronfenbrenner, 1979) takes place when the influence of third parties does not directly affect the child, but indirectly through impacting the parents' perceptions.

Specifically, the majority of the mothers wished for their pre-schoolers to gain exposure to digital technologies through their tablet use to keep abreast of the changing world around them:

> "I want her to be updated with the different technologies so that she is aware of them. Otherwise she will be outdated. I will not want that." S10, mother of two girls aged 4 and 9

That wish intensified among mothers who were initially reluctant about buying a tablet when they saw other children in the family's social networks gaining access to the tablet before their own child did, thus stoking fears of losing out to others even when they were unsure about the consequences of purchasing one:

"When she saw a few friends gathering around a device, she got curious and asked me about it. It's a parental instinct to empathise with our child. We want our child to have things that other kids have, regardless of whether we know it's good or not. Personally I don't want to, but I felt that I needed to buy [this tablet] for her." S30, mother of a 5-year-old girl.

The pressure to keep up with other children's tablet use also applied to accessed content. Many mothers actively introduced effective educational apps that their children used to other parents, and/or observed and enquired about educational apps that other children used before introducing them to their children:

"My child learned to read [Vietnamese alphabets] thanks to this app. [My colleagues] heard about it and were very interested in hearing me share with them [about the app]. Other kids at this age can only read the '*a*' letter or the word '*ba*' (daddy). But my child knows how to read this whole [Consent Form]!" S05, mother of a 4-year-old boy.

Thus, at the exosystem level, the family's social networks shaped the Vietnamese parents' wish for their pre-schoolers to gain access and educational benefits from tablet use, which in turn influenced their actual tablet purchases and supervision of their children's accessed content. With social networks come social comparisons and peer pressure. Hence, the much-vaunted educational value of tablets, even if not ultimately realised in practice, was still strongly desired by parents in their unyielding quest to ensure that their own children did not fall behind their peers.

## Macrosystem influences

The macrosystem is the overarching cultural and social context that affects children most indirectly (Bronfenbrenner, 1979). In this study, Vietnam's cultural and social contexts manifested their influence on pre-schoolers' tablet use for learning in two salient ways: the valorisation of education for upward social mobility and Vietnam's stressful education system, and the paucity of public education for parents despite the popularity of tablet use among Vietnamese children.

The parents' enthusiasm for tablets' educational benefits and their efforts in purchasing and encouraging the use of educational apps as elaborated upon in the previous sections can be attributed to the mothers' perceptions of tablets as a critical educational tool. They saw these devices as being able to enhance their children's academic potential, thereby boosting their chances for future upward social mobility. The valorisation of education in Vietnam frequently emerged in our findings, and parents were willing to make sacrifices to give their children the best educational advantages possible. For example, S41 went through considerable inconvenience to take her 5-year-old daughter to a private English centre located some distance from home with the hope that her daughter would have a promising future:

"The [English] classes around [this peripheral district] do not cover good basics [..], so I want her to take the English class in the city. [It takes us] a 45-minute motorbike ride [to go from our home to the English class]. [When my child is in the class], I will visit some drink stall and wait for her, because going back and forth will take too much time actually [..]. I need to expose her to English [early so] she can learn English better [at primary school]. [People now] need English certificates to apply for jobs." S41, mother of a 3-year-old boy and 5-year-old girl

Moreover, the Vietnamese mothers' encouragement of the use of educational apps could be seen as their strategy to cope with Vietnam's stressful education system. Some mothers expressed significant anxieties and even anger about the Vietnamese culture of private tuition and the heavy workload and stiff competition at school, while some mothers already enrolled their 5-year-old pre-schoolers in private tuition classes for English, Vietnamese and math. Given this social trend, the use of tablets as educational tools, with their visually appealing and entertaining features, that could be easily accessed in the cosy setting of the home, could be regarded as the most convenient and enjoyable way to arm the child with prior knowledge before entering the stressful primary school environment. In the words of one mother:

> "If your child is about to enter Primary 1, your child will already be expected to know the [Vietnamese] alphabets in advance, [so] I try to teach her at home. If I just show her a letter [on a piece of paper], it may be very difficult to remember. But if she learns the letter on the tablet, she will remember that letter much faster thanks to the cartoons." S11, mother of a 4-year-old girl

Second, despite the popularity of tablet use among Vietnamese pre-schoolers at home due to their low prices and aggressive commercialisation by retailers, the mothers reported being generally perplexed by tablets and smartphones' potential effects on their children due to a sore lack of social scaffolding. No mother mentioned being exposed to, or hearing about, any public education material regarding the effects of young children's device use and how parents should manage it. To better guide themselves in monitoring their children's device use, many mothers actively read the news or discussed this matter with relatives, neighbours and friends to learn more, but with seemingly little success. Some mothers commented that different news sources contradicted each other about the effects of tablet use and that they were torn between weighing its benefits and risks, and deciding which sources to trust. As mentioned previously, there was scarce guidance from the children's schools, and some mothers held subjective or speculative understanding of the effects of tablet use. This situation was further exacerbated when some Vietnamese mothers duly noted the limited quantity and quality of content and apps that were made specifically for the Vietnamese market. This stood in stark contrast to an abundance of appealing content and apps from foreign countries, which caused the mothers considerable difficulties in choosing and explaining content to their pre-schoolers given their limited command of English and lack of familiarity with Western popular culture. This notable lack of public education on children's touchscreen device use, therefore, signals an urgent need for intervention measures to support Vietnamese parents' supervision of their pre-schoolers' tablet use, failing which they revert to their own subjective reasoning and naïve understanding of the matter. S42's quote below best conveys these challenges that Vietnamese mothers were facing:

> "Many [retailers] are competing against one another. I don't think [the creators of touchscreen devices] want to harm us [..]. This iPad has been here for so long. The government, the school should have known that kids really like these things. But they have never warned me about anything. So I just use my own instincts, I let my child play." S42, mother of a 1-year-old boy and a 5-year-old girl

In brief, at the macrosystem level, the overarching influence of Vietnam's unique cultural and social contexts gave us a fuller picture of why Vietnamese parents strongly emphasised the educational benefits of their pre-schoolers' tablet use. It also highlighted the dire lack of public education regarding device use for Vietnamese parents, a discernible failure by public regulatory agencies to catch up with the aggressive commercialisation and pervasive use of touchscreen devices.

## Conclusion

This paper has extended the existing body of literature on pre-schoolers' touchscreen device use and early childhood learning by focusing on the understudied research site of Vietnam with its unique cultural and social contexts. It has also applied Bronfenbrenner's ecology of human development to broaden our understanding of the multifaceted influences on pre-schoolers' tablet use. Despite the framework's pertinence (Jordan, 2004), it has hitherto not been widely applied in studies of children and the media. Our paper goes beyond the question of whether touchscreen devices are beneficial to pre-schoolers' early childhood learning to examine the various meanings and settings of touchscreen device use and the central role that parents play in supervising touchscreen device use. It also explored other factors outside the home and school environments that influence touchscreen device use, and how such use could be better informed and guided at the micro-, meso-, exo- and macrosystem levels. Consistent with Jordan (2004), our findings suggest that children's media use and their parents' supervision do not exist in separate realms, but in a variety of interconnected dimensions and systems filled with the richness of everyday life.

We made two key findings. First, Vietnamese parents play a central role in their pre-schoolers' tablet use for learning. Due to their dependence on their caregivers, the pre-schoolers' access to tablets and content were initiated and heavily influenced by their parents' supervision. While the children tend to prefer entertainment content, the parents strongly encourage educational content that would potentially give their children a distinct edge in educational achievements. The parents' emphasis on tablets' educational value was further reinforced by social comparisons and peer pressure, and Vietnam's social valorisation of education for upward social mobility, as well as the strain of the stressful education system. Second, Vietnamese parents' monitoring of their pre-schoolers' touchscreen device use is contextualised within the unique media landscape of Vietnam, where zealous adoption of foreign digital technologies is undermined by a dearth of local social scaffolding. Specifically, the commercialisation and popularity of tablets in the Vietnamese home were in part influenced by aggressive marketing and dominance of foreign electronics giants. Yet the country's early childhood education system, public education structures and locally produced tablet content for children have not kept pace with the growing use of these devices. As such, many mothers had to rely on informal self-education through reading the news or consulting relatives and friends, while some mothers held subjective or speculative understandings of what tablets could do to and for their children, or had difficulty understanding child-oriented content from foreign countries.

These findings suggest two main implications for research and public education. To kick-start the use of touchscreen devices in early childhood education and invigorate critical discussion surrounding touchscreen devices and Vietnamese children, relevant

authorities and organisations in Vietnam should conduct more research and pro-actively intervene to provide Vietnamese parents and educators with the necessary advice and support, especially on the extent to which pre-schoolers should use tablets, and how to optimise such use for educational purposes. Further investigations should also seek to uncover the potential negative effects of tablet use at such a young age. Content and apps made in Vietnam for Vietnamese children should be strongly encouraged for greater local relevance and language compatibility. Research from the US and UK has found that low-performing children gained more from tablet educational apps, and touchscreen devices can play a bigger role in reading for enjoyment rather than for performance in assessments (Formby, 2014; Outhwaite et al., 2017; Schacter & Jo, 2016). As well, Jordan et al. (2010) noted that children's enjoyment of television viewing could provide them with some learning gains. Hence, at least for now, Vietnamese parents should be advised to manage their expectations of pre-schoolers' learning outcomes so that learning through tablets at home will be a joy rather than a chore, so as to avoid exacerbating the already excessive emphasis on educational achievement in Vietnam.

## Note

1. A smart television in this research has the functions of receiving traditional broadcasting media like a normal television, but can also be used to connect to the Internet for purposes such as browsing the web, watching online videos, etc.

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