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STUDENTS' COMPUTER USE AT HOME: A STUDY ON FAMILY ENVIRONMENT AND PARENTAL INFLUENCE

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Although parental influence on children's development is commonly accepted as essential, the way how parents affect students' information and communication technology (ICT) use at home needs to be explored further. This exploratory study aimed to contribute to a better understanding of parental influence on children's computer use at home by analyzing interview data collected from parents and students from two secondary schools. The study identified five components of parental influence: parental ICT skills, parental monitoring, parental control, parental guidance and parental worries. The relationships among these components were often complex with intriguing similarities and differences among the participants. The findings suggest the existence of parental influence imbalances in regard to students' home computer use, an aspect of the digital divide in education.

Keywords: Parental influence; students' computer use at home; digital divide; educational inequality.

1. Introduction

Based on the assumption that the benefits of ICT for education are considerable, a score of measures exist that try to provide students with physical access to and effective use of ICT. As has been in the case of universal access to education (Coleman, 1990), much of the effort in the area of ICT in education has been devoted to addressing the issue of equity and equality (Becker, 2006; Judge, Puckett, & Cabuk, 2004; Sutton, 1991; Volman & van Eck, 2001). We might simply call this issue the "digital divide in education", that is, the gap between students with access to ICT and those with limited or no access at all. This definition is, however, rather incomplete. Unlike studies in sociology, politics and economics that have regarded the digital divide as socioeconomic inequality in the

physical access to and usage of ICT (Compaine, 2001; Ono & Zavodny, 2006; Warschauer, 2003), a concept of digital divide in education must include the imbalances in education, especially learning.

Although it has been noted in the literature that the environment within which the technology is used could be related to the learning outcomes (Newhouse & Clarkson, 2008), research into the digital divide from an educational perspective is scarce (Van Dijk, 2006), and often, it does not go into sufficient detail concerning possible inequalities in the implementation of ICT programs for digital access (Yu & Lin, 2011). There is an increasing amount of literature concerning ICT use in education across all domains in life, including outside school or informal learning contexts (Stevenson, 2008, 2011; Zhao, 2009). ICT-mediated education should be viewed as a whole and should take broader social or cultural contexts into consideration, for instance, the family and home factors (Hohlfeld, Ritzhaupt, & Barron, 2010; Vatrapu, 2008). Although several studies in the literature deal with the factors affecting children's ICT use in the family environment, their findings are often fragmentary as they seldom attempt to align all the factors with a systematic and comprehensive theoretical framework/model for a better understanding. After reviewing existing literature on technology use, this study introduced Social Cognitive Theory (Bandura, 1986) as the research framework.

The present study compared the interview data from parents and students from two individual secondary schools in Hong Kong and attempted to contribute to a better understanding of parental influence on children's ICT use at home. The research questions were as following:

- How does students' home-based ICT use relate to their family environment?
- What are the possible components of parental influence on students' ICT use at home?
- What are the possible associations between different parental influence and students' home-based ICT use?

2. Literature Review

2.1. Social Cognitive Theory (SCT) and technology adoption at home

In the literature, students' use of ICT, and personal and family inducements have been separately studied, but the interrelationships between the two have seldom been discussed. For example, the Diffusion of Innovation Theory (Rogers, 2003) and the Technology Acceptance Model (Davis, 1989) typify the way how technologies are perceived and accepted by individuals. The Diffusion of Innovation Theory claims that there are key elements of an adoption: the innovation, communication channels, time, and the social system (Rogers, 2003). On the other hand, the Technology Acceptance Model suggests that perceived usefulness, perceived ease of use, and intention to use are the factors that determine an individual's adoption of a technology (Davis, 1989).

Other approaches to understanding the use of a technology are the Theory of Reasoned Action (Fishbein & Ajzen, 1975) and the Theory of Planned Behavior (Ajzen, 1991), which have more explanatory power regarding the correlation between attitude

and behavioral dimensions. The Theory of Reasoned Action suggests that people's behavioral intentions depend on their attitudes concerning behavior and subjective norms. Theory of Planned Behavior includes another factor called "perceived behavioral control", which originates from self-efficacy theory (Bandura, 1986) and refers to people's belief in their own ability to succeed in a specific field. In both models, the concept of social influence has been assessed by social norms and normative beliefs. The Unified Theory of Acceptance and Use of Technology (Venkatesh, Morris, Davis, & Davis, 2003) further examines these social norms and normative beliefs through two factors: (1) the social influence factor, namely, the degree to which individuals perceive that subjectively important people around them believe they should use the technology; and (2) the facilitating conditions, that is, the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of a technology. However, all the foregoing models mainly view behavioral aspects in the ICT adoption process as a unidirectional casual relation responding to personal attitudes and social influence. For instance, they often view social influence and personal factors as independent variables, and the use of technology as a dependent variable.

What is more akin to the present research is the (SCT), which emphasizes a dynamic interactive process among environmental, behavioral, and personal factors to explain human functioning and development, which are reciprocal (Bandura, 1986). Bandura (2001) regards individuals as agents of their own development, intentionally making things happen by their own actions. In his view, human agents are more proactive than reactive. Personal, contextual, and self-related processes interact to influence individuals' motivation and therefore exert influence on their behavior. The personal, environmental, and behavioral aspects together form the dynamic model that Bandura (2001) calls the Triadic Reciprocal Causation. Individuals learn from the vicarious experience of observing other people's behavior and its outcome in order to know whether this behavior will be detrimental or beneficial (Bandura, 1986). Human functioning is rooted in a social system with various social-cultural influences. Thus, the social structures would represent some "authorized systems" of rules, social practices, and sanctions designed to regulate human affairs (Bandura, 2001).

According to SCT, "the acquisition of knowledge and skills regarding innovations is necessary but not sufficient for their adoption in practice. A number of factors determine whether people will act on what they have learned. Environmental inducements serve as one set of regulators" (Bandura, 1986, p. 148). As for the relationship between personal and social factors, Bandura (2001) argued that socio-structural factors operate through psychological mechanisms of self-system (e.g beliefs) to produce behavioral effects. For example, the socioeconomic status and conditions of the family, such as educational level and family structure, affect behavior through their impact on an individual's affective states, sense of efficacy, personal standards, and other self-regulatory influences, rather than directly (Bandura, 2001).

The foregoing literature review, especially with respect to SCT, has several implications for the present research. In a study of students' behavior regarding computer

use at home, the environmental factors should be taken into consideration. It is important to point out that these factors are not isolated clusters, but are dimensions in dynamic interrelations. Among environmental factors, the present study focuses on family environment, especially the parental influence.

2.2. Family environment and students' ICT use

An important point arising from the foregoing discussion is the fact that family environment factors affect students' use of ICT. There is a widely agreed concept that students' educational attainment achievements are always supported by their families (Epstein & Jansorn, 2004). Originally, researchers from education referred family involvement mostly to the parental involvement, which usually means a father or a mother, attending parent teacher association (PTA) meeting, school funding, or supporting the classes. Also, the broader social context within which parents and children interact with each other were notified (Belsky, 1984). In a process model by Belsky (1984) to study the processes of competent parental functioning, he focused on a series of contextual factors that affect parental behavior, for example, the child rearing, hence, would influence children development.

The existing literature shows that children's family environment, including parents' job status, ethnicity, income, and educational level, can influence children's educational attainment. Students from lower socioeconomic status (SES) families tend to show less confidence in their ICT skills and to have fewer opportunities to develop ICT competency (Vekiri, 2010). In particular, female university students with one or both parents from minority groups, or blue-collar workers or unemployed are at a disadvantage in terms of computer skills and knowledge (Tien & Fu, 2008). Even when the impact of computer use on students' learning outcome is found to be positive, the effect size is much smaller for lower SES students (Attewell & Battle, 1999). What is more, compared with students from families who have been exposed to ICT for several years, the previously disadvantaged family members do not change their status as a result of their later engagement with ICT (Angus, Snyder, & Sutherland-Smith, 2004). A further point is that in the provision of access to ICT to children, attention should also be paid to other socio-political aspects (Angus et al., 2004).

The importance of home-based ICT use by teenagers has been noted from different research perspectives. One perspective, the educational ecology perspective, suggests that we view the adoption of ICT in education as a whole and take into consideration the broader social and cultural contexts, in which the family and home factors count a lot (Hohlfeld et al., 2010). It was also argued that all schools should consider the dynamic relationship between school and family in their planning of any technology use because such a relationship could increase the social capital and empowerment of citizens and families, which will improve the learning outcomes (Hohlfeld et al., 2010). The role of home computers can be crucial in enhancing adolescents' digital skills and self-efficacy regardless of country-basis high or low ICT penetration rates. A possible explanation for the latter may be that home-based activities such as computer game playing, downloading,

and emailing might be more closely related to digital skill enhancement than school-based activities (Zhong, 2011). It is also argued that schools ICT integration efforts need to take into account the differences in students' prior experience and should be aligned to students' computer use at home (Vekiri, 2010).

However, computer access at home does not ensure academic use of the computer. Obviously, for education stakeholders, the most desired and expected use of computers by students is educational computing rather than general use such as gaming, online shopping or communicating. Even prior to the era of Internet browsers, all the children turned their home computers into game machines or word processors. Only about one in five of them were using technology for academic purposes, but these were of a fortuitous kind and for a short duration despite the fact that academic use received far more encouragement and involvement on the part of their parents and older siblings (Giacquinta, Joseph, Bauer, & Levi, 1993). From the perspective of first and second digital divides, that is, physical access and amount of usage, Attewell (2001) pointed out that there could be a digital divide arising from disparities in the home use of ICT with consequences for education.

2.3. Parental influence on students' ICT use for educational purposes

Among the many aspects of parents' children rearing practice, parental involvement has been widely discussed (Lee & Shute, 2010; Mattingly, Prislin, McKenzie, Rodriguez, & Kayzar, 2002; Pomerantz, Moorman, & Litwack, 2007). One of the widely used classifications for parental involvement was developed by Epstein and Dauber (1991) and referred to parental involvement as parenting, communicating, volunteering, support for learning at home, participating in decision making, and collaborating with the community.

Although researchers have conducted many studies on various activities that address the issue of parental involvement, Lee and Shute (2010) concluded that there are three facets of parental involvement: attitudinal components, behavioral aspects, and stylistic components. The attitudinal components include parents' aspirations or expectations for their children's educational success; the behavioral components include parents' assistance with homework or attendance at parent-teacher meetings; and the stylistic components refer to parenting style or family interaction patterns (Lee & Shute, 2010). With regard to behavioral aspects, most of the research on parental involvement has investigated the effect of parents attending home-school collaboration activities, as for example, in studies that have analyzed the effects of parents' participation of school-related activities. In this study, we focused more on the behavioral aspects of parental involvement with students' home-based ICT use.

In fact, home-based parents' involvement might be particularly important because this is the most frequent form of parents' involvement (Ritblatt, Beatty, Cronan, & Ochoa, 2002), more natural and likely to entail more interactions between parents and students than school-based activities (Pomerantz et al., 2007). It has been shown that parental involvement may be particularly beneficial for children when it is autonomy supportive, process focused, characterized by positive affect, or accompanied by positive beliefs. In

contrast, parental involvement may be detrimental to children if it is controlling, person focused, characterized by negative affect, or accompanied by negative beliefs (Pomerantz et al., 2007). It seems that not enough attention had been paid in the literature to parental influence in regard to children's ICT use at home. Primary school students' use of ICT in an informal context has been found not only to be conducive to learning, but also to afford opportunities for children to interact in new and dynamic ways (Yelland, 2002). Studies have highlighted the role of socialization in the gender gap in computing and the need for research and educational interventions that focus on the social practices that communicate gendered expectations to young boys and girls (Vekiri & Chronaki, 2008), such as the family practice.

Findings from selected studies suggest that the presence of computing resources and adult users at home are the most important factors in explaining disparities of use among children. For example, the number of adults using the Internet inside and outside home (e.g. at work) is known to be associated with school children's use of the Internet due to either exposure to peer use or indirectly perceived value of the Internet (Cleary, Pierce, & Trauth, 2006). Internet use by family or friends provides a support called "social support network" for problems encountered, knowledge via advice, commendations and encouragement to go online (Hargittai, 2003). Similarly, siblings' help can be regarded as help from a "trusted peer", and this is assumed to be the main scaffolding mechanism for children's entry into the digital learning journey (Henning & Van der Westhuizen, 2004). Parents' support could be a critical foundation for the successful implementation of an information technology curriculum to foster information literacy (Kong, 2008) since parents can influence their children's relationship with ICT by providing technology resources, creating learning opportunities and communicating their own values and aspirations about their children's ICT use (Vekiri, 2010). This is congruous with the findings from psychology: it is through parents' beliefs and behaviors that family socioeconomic factors indirectly relate to children's academic achievement (Davis-Kean, 2005).

To sum up, the existing studies indicate that family background, especially the influence from parents, has an impact on children's ICT use in general, which in turn has an impact on education. However, studies describing those clusters of parental factors that affect students' home use of computer are few. It is quite apparent therefore, that there is an interesting research gap in the likely linkage between parental influences and children's use of ICT at home for educational purposes. The present research attempted to contribute to knowledge in this area.

3. Method

This was a qualitative study of parental influence on students' computer use at home. Generally speaking, qualitative research is an approach that allows the researchers to investigate participants' experiences in detail, using specific research method, for instance, in-depth interview, focus group discussions, observations, content analysis and so on (Hennink, Hutter, & Bailey, 2011). One of the important features of qualitative

research is that it does not only help to identify the issues from the perspective of the participants but also allow the researchers to understand the meanings and interpretations (Hennink et al., 2011).

In the present study, focus group interviews were the main way of data collection, supplemented with other data, for example, we visited the two participating schools' websites to get their background information of ICT facilities. For a better understanding of the method of this research, some specific contextual facts concerning Hong Kong ICT in education are needed. According to a systematic review of ICT use by primary and secondary students in Hong Kong education before 2011 (Yuen, Law, Lee, & Lee, 2010), great improvements have been made in accessibility to computers and the Internet in schools between 1998 and 2006. The mean student-computer ratio in Hong Kong decreased from 23:1 in 1998 to 6:1 in 2006, indicating a substantial improvement. Pedagogical support and technical support available to ICT-users in schools also improved significantly in Hong Kong over the same period (Yuen et al., 2010).

In a qualitative study, it is quite crucial to reflect the way the researchers enter the community, conduct the research, and be viewed by the participants. One aspect is the process of participant recruitment (Hennink et al., 2011). In this study, we adopted two participant recruitment methods: the gatekeeper and informal network. This study was conducted in two Hong Kong secondary schools (School A and School B). By using researchers' personal network, we began with asking help from the school principals. After getting endorsement from the principals, the school information technology coordinators and the Parents Teacher Association (PTA) helped us with the participant recruitment. These principals, school coordinators, and PTA who served as the gatekeepers in our study, were very important because they facilitated our research by providing endorsement to enter their schools to conduct research, helping recruit participants who meet our criteria, and exerting the influence of trust on the participants. These are all the benefits of using gatekeeper's participants' recruitment (Hennink et al., 2011).

Both of the two schools locate in the suburban areas of Hong Kong. According to Hong Kong school banding system based on the average student achievement, School A ranks much lower than School B. The ICT facilities in School A include computers and projectors in their 20 classrooms, as well as 10 special rooms such as physics lab, chemistry lab, arts, and library. The computer lab contains 42 computers connected to the Internet and several others without a broadband connection. As far as ICT facilities in School B are concerned, the school is also well equipped with 30 standard classrooms with a full range of ICT support: 2 multimedia learning centers, 4 laboratories, 6 special rooms, library resources center, English learning center, multimedia production center, campus TV studio, and so on.

Student participants selected in this study were in their second year of junior secondary school (13–14 years old). Although we asked the school PTA for help, it was still difficult to interview all the student participants' parents. As a result, some parent participants were those with a child in the same year as our student participants. Some

others were the parents of students from other grades of the same junior secondary school. Focus group interviews, lasting an average of half an hour to one hour, were carried with five to eight students and parents separately. All the interviews were recorded by audio device. During each interview, one research assistant holding a Master degree in Arts and one research student holding a Master degree in Education took turns to hold the interview and take records of the sequence of speakers for later transcription. The interviews were carried out in Cantonese, which is the local language. And they were transcribed by two undergraduate students majoring in Education then translated into English by the research assistant.

The research team prepared a list of initial interview questions (see Appendix A and Appendix B). Then six focus group interviews were conducted with a total of 37 participants distributed into the following groups: For School A, two students groups with 10 participants and one parents group with 6 parents; for School B, two students groups with 16 participants and one parents group with 5 parents, as shown in the Table 1.

Audio recordings from the focus group interviews were transcribed into text verbatim. Content analysis was performed to try to identify descriptive codes, interpretive codes and pattern codes in an iterative manner (Miles & Huberman, 1994). Pattern codes identify emergent themes or explanations that the data set suggests to the analyst in order to categorize them into a smaller number of overarching themes or constructs. Hence, pattern codes are more inferential and explanatory than simple codes (Ref. ibid. pp. 57 & 69). We classified the interview data into several initial codes: home use, home ICT facility, parents' monitoring, and so on. But, as Miles and Huberman (1994) point out, check-coding could be performed in a reiterative manner even when research is quite advanced (p. 64). It is in fact, these later coding that bring about the richness of a qualitative method. This is also the case of pattern coding: "pattern coding is a way of grouping those summaries into a smaller number of sets, themes, or constructs (p. 69)" For example, the statement "we have two computers at home" was classified as "home ICT facility". Then we identified the three constructs (no longer "initial codes"): students' use of home ICT, parental influence, and family environment.

Table 1. Participants' information.

School	Group No.	Participants	Participants' code
A	1	Parents	A_Par_01,A_Par_02, … ,A_Par_06
A	2	Students	A_Stu_01,A_Stu_02, … ,A_Stu_05
A	3	Students	A_Stu_06,A_Stu_07, …, A_Stu_10
B	4	Parents	B_Par_01,B_Par_02, … ,B_Par_05
B	5	Students	B_Stu_01,B_Stu_02, … ,B_Stu_08
B	6	Students	B_Stu_09,B_Stu_10, … ,B_Stu_16

4. Results and Discussion

While coding the text, several themes emerged: family ICT facilities, parental influences, and students' use of computer at home. With respect to parental influence, five sub-themes were identified: parental ICT skills, parental monitoring, parental worries, parental guidance, and parental control. The following discussion concerns those themes or sub-themes relating to the study. Some of the excerpts from the transcriptions were chosen and presented since they were typical.

4.1. Family environment

The findings of the present study are consistent with the fact that since 2008, great improvements have been made in students' home Internet access in Hong Kong (Yuen et al., 2010). When the interviewer asked the students: "Do you go online at home?" All of them answered: "Yes." Moreover, they all agreed that they used home computer a lot. In the case of some families, there are more software installed in their home computers than in the school computer room. However, merely providing the physical ICT facilities to children is not enough; the social ICT environment must also be considered. This present study defines the family social ICT environment as the family context where the children interact with ICT, including parental influence, children-parents interaction, and siblings' influence and so on and our focus is on the parental influence.

4.2. Parental influence

We identified five categories of parental influence: parental ICT skills, parental monitoring, parental control, parental guidance and parental worries.

4.2.1. Parental ICT skills

The results of the interviews show that all of the parents from both schools regarded themselves as non-proficient in ICT skills. Nevertheless, there were significant differences between the two. Most of the School A parents seemed to be beginners in such skills. A_Par_06 said during an interview, "I am not so skilled in ICT," and this was greeted with a nod by the rest of the parents. In order to verify such a self-evaluation, we asked their children, the second year students, about their parental ICT skills. The following answers were obtained from different students:

My parents' ICT ability is just so so. (A_Stu_06)
My parents seldom use ICT. (A_Stu_08)
My parents are not familiar [with ICT]. (A_Stu_07)
[My parents] know a little bit. If you help them to start the computer and open the Web pages, they will browse. But they do not know how to shut down the computer, type, or search something [via the Internet]. (A_Stu_09)

School A parents' lack of computer skills could be attributed to different causes. It was clear, however, that their children did not receive help from them in that regard. When the children of these parents encountered difficulties in using home computers, they admitted that they would try to seek help from friends and teachers, not from their parents.

The ICT skills of School B parents were slightly better. Parents considered themselves as having a fair level of ICT skills as all of them used computers on a daily basis:

I just search for information. For example, I will look up the bus route and roadmap information. (B_Par_05)

I can go to the school website to find out what is happening. (B_Par_04)

I use Facebook. Actually, I use [the computer] more than my son. (B_Par_01)

Nonetheless, many others were not satisfied with their own skills and would seek help from their children when any problems arise:

[my computer skills are] fair. [I] do not know why they [my children] are so clever [in using the computer]. [I will] consult with them when [I] get confused [when using the computer]. (B_Par_02)

I think I am at primary school level [in using the computer]. (B_Par_05)

I am at middle school level [in using the computer]. (B_Par_02)

I am not so clear [about computer use]; [I] have to ask them [the child] for help [in using the computer]. (B_Par_02)

The level of ICT skills of the parents in School B was more likely to enable them to interact with or follow up their children better than their counterparts in School A. It may also explain why children from School A had to ask their peers and teachers for help, and not their parents.

4.2.2. Parental monitoring

Parental monitoring in this paper refers to parents intentionally observing or inspecting what their children are doing with the computer. The two sample schools differed significantly from each other in this respect.

In general, parents from School A reported relatively less monitoring. When they were asked by the interviewer whether they knew what their children were using the computer at home for, most of them answered by saying something alike. A_Par_01 replied: "Actually, I am not clear [about what my child is doing with the computer]." Furthermore, when asked if they knew whether or not their children watched online pornography, their usual answer was, A_Par_05 answered: "I do not know, [so] it is very difficult to answer [this question]".

In contrast to School A parents, School B parents seemed to follow up their children's home use of computer. For example, either they were able to tell the interviewer very confidently that their children never went to indecent websites because they had been observing them, or they all said they would check again what websites their children opened. All the School B students said that they had copied information from the Internet for their homework, and their parents were aware of this since they could even tell the interviewers for which subjects their children copied information, B_Par_02 said: "My child must have copied … history."

4.2.3. Parental worries

It was quite clear that all the parents from both schools were somewhat anxious about their children's use of computer at home. However, the reasons for those worries were different.

For School A parents, these worries were about negative effects on physical and moral well-being:

[Using the computer] is harmful for the eyes. (A_Par_01)

If [my child] sits in front of the computer for a long time, his bones must be fatigued. I am worried about his health. [Using the computer] affects the development of the bones. (A_Par_05)

The problem of health. (A_Par_04)

The most important thing is the harm to the eyes. (A_Par_01)

Only one School A parent expressed his worries about the online risks:

I am afraid of negative information from the Internet. (A_Par_06)

Compared to School A parents, School B parents were concerned more about their children's thinking ability and communication within the family, apart from health hazards and moral risks. In addition to health related issues such as lack of sleep, some parents from this school suggested that since their children intellectually depended a lot on the Internet, their thinking ability might deteriorate. However, above all, they seemed really worried about decreasing family communication due to their children spending many hours online:

Communication diminishes; when [my child is] online [our] communication become less. (B_Par_01)

He does not hear when one is talking to him. (B_Par_02)

When online, he will not sit there or talk to you. He seems to get bored when you talk to him. (B_Par_03)

It could be suggested that the School B parents were concerned not only about their children's activities online, but also about a more holistic development of their children.

4.2.4. Parental guidance

The differences between the two groups of parents were quite evident in terms of parental guidance on children's computer use at home.

As far as the parents from School A were concerned, there was less or no discussion between parents and children about the positive or negative aspects of using computers and the Internet. When asked about the benefits of using ICT for learning, A_Par_01 replied: "He [my child] knows." A_Par_01 even complained: "They [the children] are so pleased when they talk to each other. Sometimes I cannot understand their words; they say, 'why you are so outdated? I will not speak to you!'" It was quite apparent that these families were facing difficulties in communication at home, let alone providing parental guidance for computer use at home.

By contrast, communication seemed to be easier within School B families. Parents expressed their opinions about the usefulness of ICT, such as B_Par_01's answer was "[using ICT is] convenient"; B_Par_03's answer was "more references can be found"; B_Par_02 considered "no need to go to the library [to search for information]"; B_Par_02 said "[we] can get online immediately to see what is happening"; and B_Par_02 found "it is impossible for everyone [all the children] to go to the school library to finish their work, but the computer really can help." Furthermore, School B parents showed certain degree of knowledge about guidance of this kind by mentioning their own strategies:

> Usually, I will watch Police Report [a TV programme in Hong Kong] with them [my kid] because some of the warnings are about the Internet affairs or are lessons about ending up with cyber-crimes. So far, [my kid is only] secondary two students are so young and behave quite well. (B_Par_02)
>
> I will also talk with him [my kid] [about the online risks] … some of the websites … are not acceptable. You should not … I will remind him never … (B_Par_04)

The main difficulties in parental guidance seem to lay in the abilities to communicate, which in turn may be related to some basic ICT skills of the parents.

4.2.5. Parental control

All the parents participating in this research had imposed different degrees and types of restrictions on children's home computer use, typically with respect to time limits and the websites to be visited. However, control exerted by some parents was weaker and less effective.

Although all School A parents stated that they were in control of their children, some of their children did not agree with such assessment and even said that there were no restrictions at all. When the interviewer asked: "Do your parents place any restrictions on your Internet use at home?" Most of the students replied with a negative answer. Only a

few said there were some restrictions, like, "my Internet playing time is from 9:00 to 10:30 pm [excerpt from A_Stu_01's words]" or "I can play on the Internet after finishing my homework [excerpt from A_Stu_01's words]." Examples of students' perceptions about their parents' control over specific websites were, "my parents do not care. Anyway, I myself do not browse that kind of website [the indecent websites][excerpt from A_Stu_03's words]," or, "I own my individual account, so they should not control me [excerpt from A_Stu_06's words]."

Then, we further discovered that from the perspectives of School A parents, the situation seemed habitually beyond control:

> My child puts off the time of shutting down the computer for a long time. (A_Par_05)
> If the child wants to play with the computer, he will stay up till very late. (A_Par_06)
> You ask him to stop; he will not listen to you. (A_Par_01)
> It is very difficult to tell whether they are doing homework or playing with the computer … (A_Par_03)

For parents from School B, the situation appeared to be different all together. There were certain rules and practices in their families. For example, their children were not allowed to use the computer during school days except for doing assignments, and they were allowed to play with computer for only a few hours or only during holidays. Another parent said that her child was allowed to spend only one or two hours on the computer after the completion of homework. It was interesting that the children from School B reported fewer hours of computing at home:

> I can use the computer for half one hour per day at most. (B_Stu_14)
> Anyway, only after finishing my own business [homework], I can play with the computer, and time is limited … about one hour a day. (B_Stu_16)
> One hour every two days. (B_Stu_13)

Specifically, in regard to the effectiveness of parental control, School B parents seemed to be far better off than their School A counterparts. School B parents appeared to be proud of their children's obedience to their rules and practices at home. B_Par_04 said, "it all depends on self-discipline … he should try to manage his time by himself … so far, the child has managed it well." The effectiveness of School B parents' control could also be attributed to dialogue and negotiation between parents and the child. B_Stu_04 said, "generally, [we both] know the amount of time needed [to do the homework]; we have already discussed it, [so] the permitted time is sufficient."

4.3. Students' home computer use

One of the most interesting findings was that when students described their use of computers at home, they most frequently used the word "to play". In a way, it unveils the main purpose of using computers at home from the point of view of the students. The

group interviews further corroborated the fact that entertainment was the main appeal of children's computer use at home. An intriguing finding of the present research was that the students from School A generally used computers for a longer time than School B students. Some School A parents admitted:

> [My child] chats online every day, could not be busier. (A_Par_02)
> [My child is] so busy that he does not have dinner. (A_Par_02)
> Maybe [he sits] in front of the computer screen for three to four hours a day. (A_Par_03)

Two parents from School A suspected that their children might use the computer for learning only one hour out of every three to four hours of sitting in front of the screen. When the interviewer asked the students: "whether they liked to use an iPad for study, all of them replied with a "No" as their plans were all about entertainment, which runs far better in iPads than in personal computers.

Although School B students' total time spent on home computing was less than that of students from School A, the parents from School B also admitted that their children might give limited use for academic purposes. B_Stu_08 told us: "I seldom use the computer to play games; I will use it to practice writing … sometimes. Some people will leave a message and tell me how to write [better]; give me suggestions and inspire me with new thoughts and new ways of arguing a point." Comparatively, School B students seemed to use computers more for learning.

5. Conclusion

The present study made use of some tenets of Social Cognitive Theory, namely the interaction between person and social environment, to examine the dynamics of a far less studied link between family environment and personal behavioral factors in the field of students' home computer use. As a result, two aspects of family ICT environment were identified: family ICT facilities and social ICT environment. It is suggested that there is a need to rethink about the family social ICT environment if we are to address the digital divide issue, especially the roles that parents play in education. The findings from the qualitative analysis suggest that the imbalances in the students' ICT skills and knowledge cannot be attributed solely to those acquired in their schools; there is a need to look at how they use computers at home and how this in turn would be influenced by their parents and family environment. This is consistent with SCT argument that the environmental inducements might serve as "a set of regulator" on the adoption of a technology (Bandura, 1986). Furthermore, it is possible to suggest that parents are not only regulators in the sense of parental control, a negative control. Parents should also be seen as facility providers and motivators in regard to their children's home computer use. And this is the reason why the present study went further to unpack the relationships of the different aspects of parental influence. Possible parental influences on students' home-based ICT use within family social environment are presented in Figure 1. Some of

the relationships among components of parental influence are illustrated in the aforementioned discussion of findings.

First, we suggest that students' home-based ICT use might be associated with the family environment and the parental influence. For the family environment in terms of physical ICT support, that is, ICT facilities at home, we found that the families in our interviews were well equipped. All the parents and students reported that there were computers and Internet access in their homes. This is consistent with Kong and Li's study, which found that parents in Hong Kong commonly provide two types of support for students to learn with IT at home. One type of support is the provision of home IT facilities and opportunities for their children to use IT for learning (Kong & Li, 2009). The material support is the need for the children from the two schools in our study to engage in computer use at home. Nowadays, technology has a ubiquitous presence in the home for most families (Hollingworth, Mansaray, Allen, & Rose, 2011). We would like to point out the significance of the dynamic relationships between parents and students (Hohlfeld et al., 2010).

Second, we identified five categories of parental influence on children's home-based computer use: parental ICT skills, parental monitoring, parental control, parental guidance and parental worries. The other type of parental support apart from physical access suggested by Kong and Li's (2009) findings is the involvement of parents in supporting their children in learning with IT at home. In this respect, the present study looked deeper into the mechanism of the detailed parental influences. The literature shows that the parenting style, parental behavior on the Internet and parents' educational background could significantly predict the Internet usage of children at home (Valcke, Bonte, Wever, & Rots, 2010). In many of the families in which parents either are not interested in the computer or have little technical expertise, individuals outside the immediate family can be seen to act as informal advisors, either to the individual child or

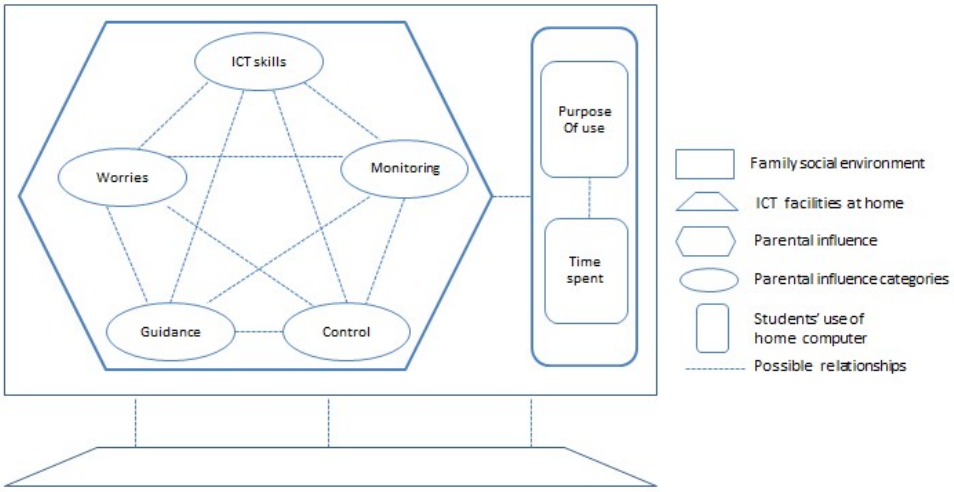

Figure 1. Possible parental influence on students' home-based ICT use within family social environment.

to the family as a whole (Sutherland, Facer, Furlong, & Furlong, 2000). Therefore, parents' ICT proficiency must be taken into consideration in research on children's use of home ICT.

Third, we tried to make interpretation on the possible links between the parental influence on students' use of home computer based on the previous data analysis and discussion, and through comparison. Some parents of School A in our study seemed to be poor in ICT skills that they did not even know how to shut down a computer. However, parents' basic ICT skills are essential for parents to monitor quality usage of ICT by their children at home. Therefore, parents with relatively higher ICT skills were more likely to monitor and assist their children in their education, which was the core of their worries.

Also, parents who communicated with their children better and guided their children closely were also more effective in controlling how their children use their time on the computer and, consequently, their children tended to spend more time on learning activities compared with their counterparts from households with poor communication skills. It could explain that children from School B did not spend as much time as their counterparts using computers at home or "playing with the computer" according to their own understanding of "computer use". Also, research on parental involvement indicates a tendency for parents to respond more to children with poor performance at schools (Pomerantz et al., 2007). Therefore, we cannot simply view the relationship between parents' involvement and children's performance as unidirectional. The interaction between parents and children and children's computer use at home might be a spiral process. This could explain why parents who worried more tended to monitor more according to our interviews.

In spite of the fact that all the parents from both schools were relatively weak in computer skills and could not help their children with the computer at home, School B parents showed more concerns about the educational dimensions of ICT and cared more about the thinking ability of their children. The parents' concerns about computer use at home are quite important as it is the family environment where the children are using home computer. A pattern of beliefs that drive an individual to engage in and react to achievement situations is represented by a goal orientation, which in particular, includes why individuals approach and engage in achievement tasks (Ames, 1992). Research into students' use of ICT at home should start with the question of what the students' purpose of using a computer is. That is, do students use it for learning purposes, entertainment, or for other purposes?

Regarding the educational attainments of the two schools, the educational attainment of students from School A is much lower than that of students from School B. If we link these publicly known educational attainments, our research findings indicate that issues such as technology adoption, equal opportunity in education, educational achievement and parental influence on children's education (Coleman, 1990) seem to be facing today the classic problems of social stratification and social reproduction (Bourdieu & Passeron, 1997). The differences between our two participant schools and their families tell us what "social reproduction" and "education as symbolic violence", as argued by Pierre

Bourdieu are all about. We believe that beyond economic, social and cultural capital and their respective inequalities, there is a digital divide in education, which is neither in access, nor in the amount of usage but in the mastery and intelligent use of ICT.

Wilson (2009) argued that families are "immeasurable resource" that could be explored by educators to enhance students' education outcomes. However, studies indicate that parents often do not engage in vigorous involvement (Plevyak, 2003). When some parents were contacted by school, there are usually due to some negative reasons (Friedel, 1999), for example, the children's poor performance in class. In this study, it is apparent that the parents were concerned with students' use of computer at home. However, it is possible to argue that one of the barriers of parents' involvement in students' use of computer at home is their lack of a comprehensive understanding on how to get involved appropriately. When parents' control or guidance over the computer use turned out to be ineffective and their children refused to communicate with them on these issues, they became "worried outsiders" (Yu et al., 2011). To address these issues, empirical studies about different parental influence on students' use of technology and the consequent outcomes are urgently needed.

Following SCT, the present study formed a research framework to investigate the impact of family environment and parental influence on students' use of computer at home. More precisely, parental influence was mainly discussed as a part of family social environment in this study, as showed in Figure 1. And the relationships between family environment, parental influence, and students' use of computer seemed to be reciprocal. The result of the present study is consistent with the SCT. However, it is important to note that the SCT provides more implications because it advocates a dynamic interactive and reciprocal process between environmental, behavioral, and personal factors in explaining human functioning and development (Bandura, 1986).

Due to the exploratory nature and limited scale of the present qualitative study, it can hardly render a robust generalization about educational use of computers at home by students. While the initial findings of the present study are promising, further research is still necessary. We suggest further studies to establish the complex reciprocal relationships between the family environment, students' personal characteristics, and their use of home computer, in particular the ways how parents and students interact in regard to computer use at home.

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Appendix A. Initial Interview Questions for Parents

1. Do you know anything about the ICT facilities of your children's school?
2. Do you think the use of these ICT facilities could help with your children's learning?
3. Do you think there are some negative impact of ICT on your children's learning?
4. What do your children usually do with home computer?

5. Do you limit your children's online activity, time limit, the websites limit, or others?
6. Do you use ICT at home? How do you rate your own ICT skills?
7. Do you usually communicate with you children online? (Email, blog, msn, Facebook, etc.)
8. Do they use other technology devices? (iPhone, iPad, iPod, etc.)

Appendix B. Initial Interview Questions for Students

1. Please tell me something about the ICT facility in your school. (classroom, library, computer lab)
2. What are the benefits of using technology for learning?
3. Do you usually use home computer? Does it belong to you?
4. What do you usually do online at home? (School-related activity, entertainment, hea ...) (to hea is to go online without any purpose)
5. Do your parents constrain your time online, websites to visit?
6. Do you communicate with family online?
7. Apart from school and home, where do you go online?
8. Besides computer, do you have other ICT device? (iPhone, iPad, iPod, etc.)
9. If you encounter some difficulties when using technology, who will you turn to?
10. How do you evaluate your own ICT skills?