

RESEARCH ARTICLE

Cultural Transformations in Parents' Handling of Child ICT Usage

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Received: 28-07-2021; Revised: 11-08-2021; Accepted: 18-08-2021

ABSTRACT

How should someone encourage “positive and quality usage of ICT” among students? Lam (2016) suggests that “school and family partnership theory” as well as “mediation philosophy” are key factors for parents when it comes to changing their attitude towards the handling of child ICT usage. Even so, what are the stages or processes of these transformations? This study will review four models and theories that predict the behavioral changes of people. Based on these theories, this study recommends a “permeability model of changes” to depict the alteration actions of parents due to the behavioral changes. Therefore, it becomes possible to aid — also known as systemic therapy — immediately during the different stages or levels of change in the model. Hence, parents can successfully change their behavior toward dealing with their children’s ICT usage, in addition to being able to control this usage. Furthermore, this paper also proposes that a social, cultural, and psychological factor of children’s ICT usage constitutes a step toward the philosophy of digital equity. These enhance the aim of the present research by ultimately urging “a positive and quality usage of ICT” among students (Yuen *et al.*, 2014: p. 13). The poor academic effects of using ICT for entertainment can, therefore, be eliminated. That said, parents must nurture their children’s passion for learning by not only controlling their ICT usage. The reason is that being overly strict may lead the child to rebel. If this was to occur, then professional intervention would be necessary. As a result, it would be possible to improve the scholarly achievements of students using educational technology, and it could also bridge the digital divide in education.

Key words: Cultural, ICT, transformation**INTRODUCTION**

There are several ideas concerning how parents should handle their children’s ICT usage. This study suggests that they should first learn “school-family partnership theory” and “mediation philosophy” (Lam and June, 2016) as well as participate more in teacher-parent associations for better idea collaboration. How should parent’s behavior be changed? This study proposes that the philosophies are transformed by the parents in accordance with the “permeability to change model” for behavior change. This change is used to handle the children’s ICT usage as shown in Figure 1. Indeed, there are four theories or models (depicted in later section) that form the

basis for describing the reasons behind such transformations. The following sections will describe the origin of these prototypes and explain why the “stages of change model” is best for depicting such variations in behavior.

LITERATURE REVIEW

What are the stages of behavioral change? According to CommGap, 2009 there are several theories or models which can best depict the picture of a person’s behavioral change. In addition, there are also social, cultural, and mental factors which influence students’ ICT usage. All of these will be described in the following paragraphs.

Theories and Models for Behavioral Change

There are various theories and models which have been developed for describing a person’s

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behavioral changes. They are social cognitive theory (SCT), theory of planned behavior, stage of change behavior, and the health belief model (HBM). This study will discuss the basic background information behind each of them SCT. What is SCT? One may consider the theory as the bi-directional interactions between:^[1]

1. Personal-Behavior: This affects one's beliefs, feelings, biological character, and hence one's actions (Bandura, 1977a; 1986; 1989). In other word, one's behavior can affect another person's thoughts and actions. Conversely, one's own thoughts and actions can also be molded and used to control a person's behavior. Other biological personal factors such as sex and ethnicity also account for the effects of SCT on behavior
2. Environmental-Personal: During this process, one's personal characteristics influence the environment (Bandura, 1977a; 1986; 1989). Put another way, human expectations, beliefs, and cognitive competencies are developed and modified by social influences and physical structures. Through factors such as modeling and instruction, these social

effects can transmit information as well as activate emotional reactions (Bandura, 1986). In turn, the environment also influences human characteristics such as one's physical characteristics such as sex and body size

3. Behavior - Environment: Bandura believes that human beings are in fact both producers and outcomes of their environment (Bandura, 1977a; 1986; 1989). What aspects of an environment a person is exposed for determining their behavior. Conversely, one's behavior is modified by the environment. A person can be affected when experiencing the environment through the selective attention of their behavior. For example, an aggressive person can create a hostile environment and thereby influence it. This means that behavior can determine many potential environmental influences. In turn, the environment partly determines the development and activation of one's behavior. This is the bi-directional relationship between behavior and the environment in which they interact and influence each other.

Figure 2 shows the interactions between the personal, behavioral, and environmental factors:^[2]

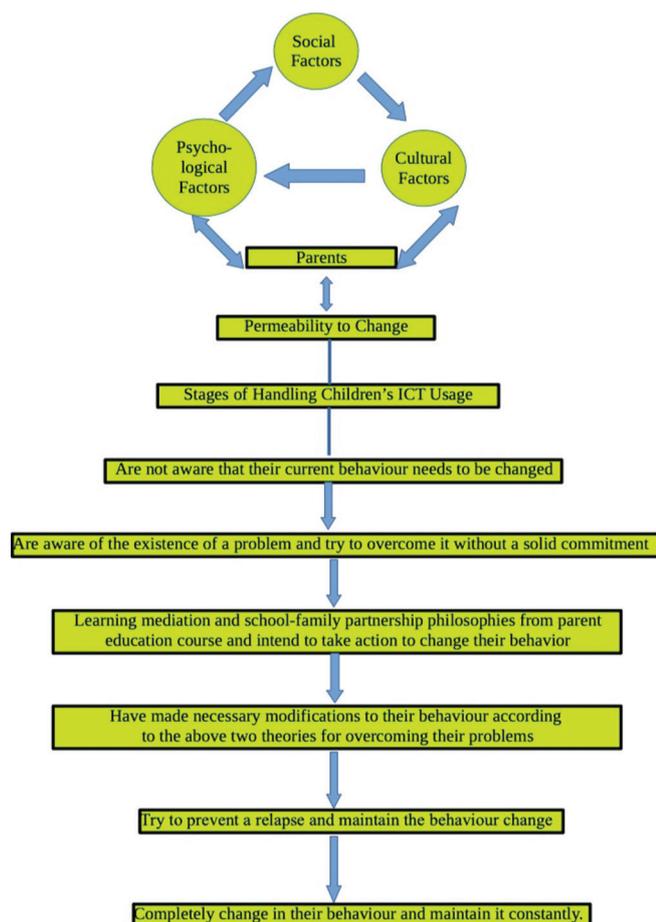


Figure 1: Permeability to change diagram

Theory of Planned Behaviors

The Theory of Planned Behavior originated from Fishbein's 1967 Theory of Reasoned Action. This stated that people will consider the implications of behavior before any action is taken (Knabe, 2012). The theory combines of:

1. The beliefs about the consequences from behavior
2. The judgments of those consequences.

At the same time, there are also two major factors that determine the intention:

1. The individual manner toward behaviors (AAc) and

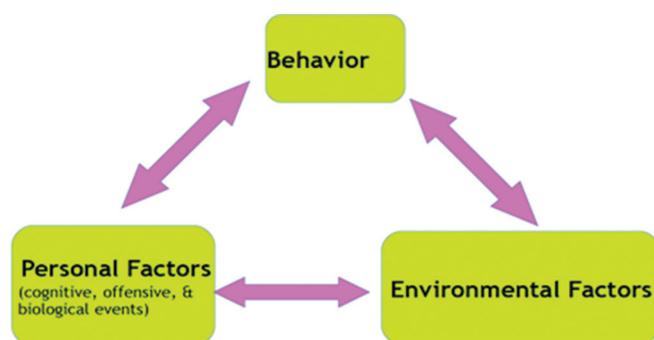


Figure 2: Social cognitive theory

2. The awareness of pressure from subjective norms (SN).

To conclude, Ajzen and Fishbein (1980) proposed that a person will try to perform a behavior only when they judge it positively and believe it is important to others in performing it.

However, other scholars commented that the relative “weights” may vary due to intent and from person to person. Figure 3 describes the “Theory of Reasoned Action:”

Indeed, the major drawback of the “Theory of Reasoned Action” is its model has no explanation for any perceived behavioral control (PBC). The flaw constituted Icek Ajzen’s updated extension to the model, named as the “Theory of Planned Behavior.” The theory mentions that “attitudes, subjective norms, and PBC can predict intention with relatively high accuracy” (Knabe, 2012: p.24).

This means that one’s behavior can be predicted through a person’s intention together with PBC. Obviously, the difference between the Theory of Reasoned Action and the Theory of Planned Behavior lies in whether one will consider volitional control as a variable. This study defines volitional control as “a person who must have the resources, opportunity, and support available to perform a specific behavior” (Ajzen, 1991).

Furthermore, one can break Ajzen’s (1988) Theory of Planned Behavior into three different components.

1. Attitude toward the Behavior (AAct): This measures the degree of a person’s positive or negative evaluation toward one’s performance of behavior
2. PBC: This refers to one’s perception of whether a specific behavior can be performed or not. In addition, it also concerns how easily the behaviour can be performed
3. SNs: This concerns other people’s beliefs about whether one should perform the behavior.

The equation can be expressed as:

$$AAct_{wi} + SN_{wi} + PBC_{wi} = BI$$

(Note: w_i = weights that are based on multiple regression analyses)

Constructs in the Theory of Planned Behavior

Actually, the Theory of Planned Behavior consists of several constructs. They are Behavioral Intention (BI), PBC, SN, Attitude Toward the Act (AAct), Behavioral Beliefs (BB), Normative Beliefs (NB), and Control Beliefs (CB). The properties for are described from Knabe, 2009 as below:

Behavioral Intention (BI)

This indicates how a person is ready to perform a given behavior or action. One may consider BI as the immediate antecedent of behavior. It is based on the equation, with each weighted predictor according to its related importance to behavior and population of interest (Ajzen, 2006). The variables include communication behaviors, health-related risk prevention actions, and specific technological adoptions.

PBC

This refers to how people’s perceptions of their ability to perform a given behavior (Ajzen, 2006). When a person handles a specific task or behavior, PBC determines an individual’s perceived ease or difficulty in performing the task. Indeed, one can determine PBC from the total set of accessible control factors. The performance of behavior may then be facilitated or impeded (Ajzen, 2006).

SN

This concern whether one’s perceived social pressure means he or she will or will not engage

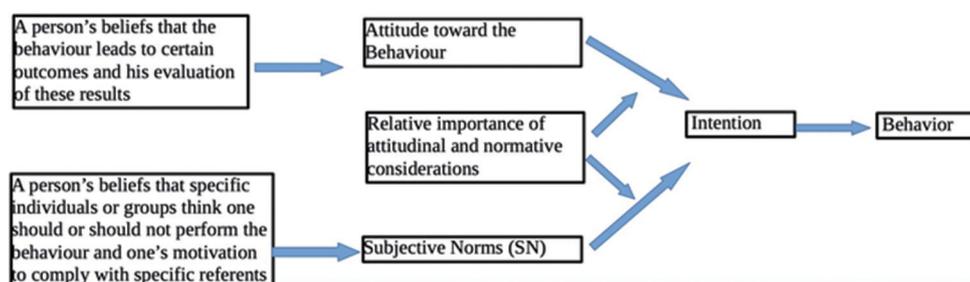


Figure 3: Ajzen, I. and Fishbein, M. (1980). Understanding attitudes and predicting social behavior. Englewood Cliffs, NJ: Prentice Hall

in a behavior (Ajzen, 2006). One can determine SN from the total set of accessible NBs. It relates to the expectations of important referents. One can weigh each NB through the motivation to comply with the question referenced and the aggregated products (Ajzen, 2006).

Attitude Toward the Act (AACT)

This is another predictor of behavioral intention and means the level of one's value in the performance of a behavior either being assessed positively or negatively. When one tries to measure AACT, Ajzen (2006) proposed that there should be a relative set of 20–30 semantic different scales which is based on time-tested published lists of adjective scales. Hence, one can select a small and internal consistency subset for the attitude measurements.

Behavioral Beliefs (BB)

This links the behavior of interest to the expected outcomes (Ajzen, 2006). In other word, one can get the subjective probability from the behavior produced outcome. Personal experience, information sources, and inferences form the basis of BBs which are easily accessible from memory.

NB

This follows a similar pattern to BBs and uses NB strength and motivation to comply.

CB

This is the antecedent of perceived behavior control and has several factors which facilitate or impede the performance of a behavior. Indeed, each control factor is associated with perceived power and hence contributes proportionally to a person's subjective probability when a control factor is present (Ajzen, 2006) Figure 4.

STAGES OF CHANGE MODEL

The Stages of Change Model, also known as the Trans-theoretical Model of Behavioral Change (TTM), consists of three discrete components which relate to transformation. These are the stage of change, the process of change, and the levels of

change. Later, self-efficacy and decisional balance were added by Prochaska and DiClemente as another two components of TTM to determine transition and behavior change. Through this model, one can understand how an individual's readiness for change may have effects on their behavioral outcomes.

The general outline of this model is described as follows:

Stages of Change

This consists of five main stages—pre-contemplation, contemplation, preparation, action, and maintenance (Prochaska and DiClemente, 1984).

To begin with, for people who are in the pre-contemplation stage, they often deny or minimize their own problems and are not ready to perform necessary changes in their life. While those in the contemplation stage have recognized their own problems and are willing to make changes when they become distressed (Martin, 2012).

Next, those who are in the preparation stage will commit to make changes and set up indispensable steps to move forward. Indeed, this stage is transitory and will not be included in the assessments of transformation. Those in the action stage will make overt behavior changes.

Finally, those in the maintenance stage have made the appropriate changes and are trying to manage the new behaviors (Prochaska and DiClemente, 1984). Both Prochaska and DiClemente warn that individuals between pre-contemplation and contemplation may develop low self-esteem and feel less in control of their lives. They must give up things they once believed to be important if they wish their behavior to change. They might fear not overcoming their problems and lose hope. Therefore, at this early stage, one hardly demonstrates true commitment to performing changes (Prochaska and DiClemente, 1984).

One might help to move people from contemplation to preparation through concern, interest, and vision with the cost not overweighting the benefits (DiClemente, 2005). Once contemplators have moved forward to the action stage, self-esteem, and self-efficacy will increase. Outsiders can observe these behavioral changes at this stage.

When one moves on to the maintenance stage, they may suffer from a relapse and recycle through the model because of poor procedure. In fact, recycling may prevent failure, for example,

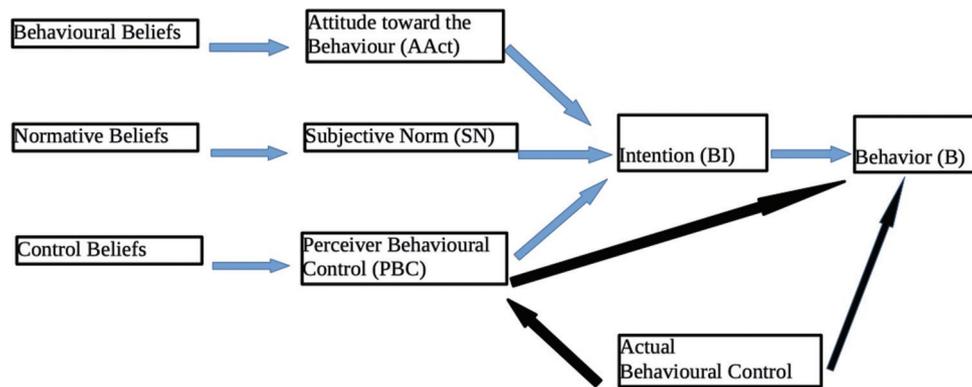


Figure 4: Summarizes the Theory of Planned Behavior and the relationship between its constructs. Source: Ajzen, I. (2000). TPB Diagram The theory of planned behavior. Retrieved Oct. 28, 2000 from the World Wide Web: <http://www-unix.oit.umass.edu/~ajzen/tpb.diag.html>

“the average smoker recycles through this model 3 times before successfully quitting” (Martin, 2012: p.4).

On the other hand, when one relapses, it means some of the tasks or stages of change were not completed. It is not an indicator to show that someone cannot change (DiClemente, 2005). To conclude, a spiral model of the stages of change is shown in Figure 5.

Processes of Change

This is defined as those who should complete the necessary tasks to move forward through the different stages of change despite the problems of behaviour (Prochaska and DiClemente, 1984).

Ten unique processes have been found that “build on each other so that the end product of the process is a new sustained pattern of behavior that is supported by the adequate accomplishment of each of the preceding tasks” (DiClemente, 2005. p. 6). The Trans-Theoretical Models’ (TTM) ten transformation processes are: Consciousness raising, self-reevaluation, social reevaluation, self-liberation, social liberation, counter-conditioning, stimulus control, contingency management, dramatic relief, and helping the relationship.

For those who make changes on their own, all ten processes apply. However, when there are therapeutic interventions, only two to three will apply (Prochaska, 1979). Usually, the first five processes are applied in the early stages of change, while the remaining processes are used in the latter stages (DiClemente, 2005). These processes are dynamic variables and are a powerful predictor of progress. They are more accurate than static processes such as demographics or problem

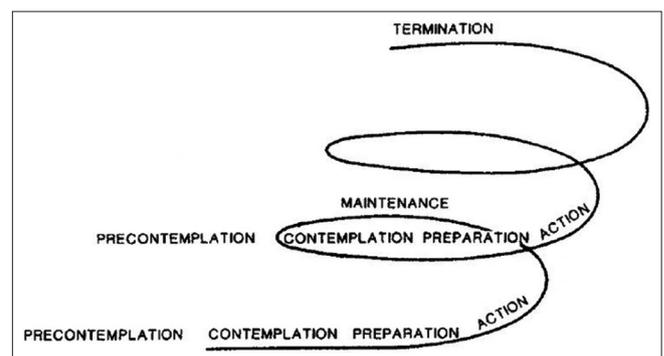


Figure 5: A spiral model of Stages of Change (Prochaska and DiClemente, 1992)

histories (Prochaska *et al.*, 1992). Table 1 will show the processes of change in the Trans-Theoretical Model^[3] while Table 2 describes the process of change that media progression between the stages of change.^[3]

Levels of Change

This is the last change component of TTM. The individual, conscious, and unconscious are the psychological problems found among the different levels. There are five levels depicted by TTM:

- Symptomatic/situational problems – the dysfunctional behavior of the client^[4]
- Maladaptive cognition – the non-functional thoughts of the client
- Current interpersonal conflicts – the person’s environment and their relationship with it. (iv) Family/system conflicts – the confrontations within the individual’s family (v) Intra-personal conflicts – the issues that a person has with themselves.

The perspective shows that there are multiple conflicts occurring at different levels which may

Table 1: Processes of change in the trans-theoretical model

Processes		
Experiential	Consciousness raising	Finding and learning new facts, ideas, and tips that support the recommended behavioral change
	Dramatic relief	Experiencing the negative emotions (fear, anxiety, worry, etc.) that go with particular behavioral risks
	Self-reevaluation	Realizing that behavioral change is an important part of one's identity as a person
	Environmental reevaluation	Realizing the negative impact of the problem behavior or the positive impact of the recommended behavior on one's proximal social and/or physical environment
Behavioural	Self-liberation	Making a firm commitment to change
	Helping relationships	Seeking and using social support for the recommended behavioral change
	Counter conditioning	Substitution of the recommended alternative behavior and cognition for the problem behavior
	Reinforcement management	Increasing the rewards for the positive behavioral change and decreasing the rewards for the problem behavior
	Stimulus control	Removing reminders or cues to engage in the problem behavior and adding cues or reminders to engage in the recommended behavior
	Social liberation	Realizing that the social norms are changing in favor of supporting the healthy behavioral change

Table 2: Processes of change that mediate progression between the stages of change

Processes of change	Stages of change			
	Pre-contemplation maintenance	Contemplation	Preparation	Action
	Consciousness raising Dramatic relief Environmental reevaluation	Self-reevaluation	Self-liberation Counter conditioning Helping relationships Reinforcement management	Stimulus control

have effects on the problem behavior. Nevertheless, some people may characterize their own problems to only one or more level while psychotherapy is also bound to one or two levels (Grimley *et al.*, 1994). Indeed, more interpersonal conflicts will be created for those symptoms supported by maladaptive cognition.

^[4]<https://www.ukessays.com/essays/psychology/a-model-for-integration-of-theories-psychology-essay.php>

Therefore, the necessary treatment needs to be provided during the symptomatic/situational level since transformation occurs quickly if one is conscious of their problems (Grimley *et al.*, 1994). When one goes forward through the different levels, the problem becomes more integrated with the sense of self (Grimley *et al.*, 1994). It should be noted that a level's psychological problems do not happen in isolation which implies that changes occurred on one level will lead to transformations on other levels. Which level someone should attend for the necessary therapy, this event depends on the therapist's theory of conflict as well as whether the client is comfortable with the content.

Self-efficacy

This concerns the beliefs in whether one can change or not. It is important for motivation

and commitment since readiness; willingness and efficaciousness are the basic requirements for transformation. In 2004, Prochaska *et al.* proposed that individuals will experience the greatest increase of self-efficacy in the action and maintenance stages. Studies shows that psychological constructs are important for predicting change in various behavior.

Decisional Balance

This component refers to one's weighing of the pros and cons for making the necessary transformation. Research shows that there is a link between the stages of change and decisional balance.

When one is at the pre-contemplation stage, the cons for changing outweigh the pros.

Therefore, when one is promoted to a higher stage of change, there will be shifts in balance and an increase in the pros for change (Prochaska and Velicer, 1997). This construct of TTM also supports those changes related to behavior and the stages of change in various population groups. Prochaska and Velicer (1997) suggested that when one focuses on the pros of change, it will be more successful than the cons of not changing when assisting one's preparation for change.

HBM

Initially, the HBM was used to explain how people failed to take part in disease detection and prevention programs (McClendon, 2011). Later, the focus changed to people's responses to symptoms and behaviors. Gradually, it grew to also include the lifestyle modifications required for sustained behavior transformation. In fact, for a person to change successfully in their behavior, one must have the idea that continuing with the current behavior poses a threat (perceived susceptibility and seriousness) and that behavioral transformation will provide a valued outcome at a tolerable cost (McClendon, 2011). Finally, the person must also believe that they have the competency (self-efficacy) to overcome the perceived barriers of a behavioral change (Bandura, 1995; Glanz *et al.*, 2002).

Based on the HBM, Hayden (2014) developed the five constructs listed below:

1. Perceived susceptibility: This refers to personal risk or susceptibility and is powerful for encouraging healthier behaviors among people. It creates a higher chance for one to engage in risk reducing behaviors. At the same time, the perceived risk becomes greater
2. Perceived severity: This concerns one's belief in the disease and of its seriousness or severity. Indeed, medical information, or knowledge forms the basis of the perceived seriousness. Simultaneously, the disease might create some difficulties to a person's own beliefs or even influence one's life in general (McCormick-Brown, 1999)
3. Perceived benefits: This depends on a person's opinion on the value or usefulness of a new behavior which will result in a decrease in the disease's risk development. People are only more willing to adopt healthier behaviors if they find that the new behavior can prevent a disease from growing. In addition, it also promotes secondary prevention behavior such as screenings
4. Perceived barriers: This refers to the evaluation of obstacles when adopting a new behavior. It is also the most important factor in determining behavioral changes (Janz and Becker, 1984). It should be noted that a person will adopt a new behavior when they discover the beliefs obtained from the new behavior overcome the consequences of continuing with

the old behavior (Centre for Disease Control and Prevention, 2004). Hence, barriers will be overcome when one adopts a new behavior

5. Cues to Action: These are activating factors for the readiness of taking the advised action (McClendon, 2011). These cues also instigate events and set the movement such that the advised action in motion will be performed. They can be either internal or external. The perceived susceptibility and severity may affect the intensity of the triggering cue (Rosenstock, 1974).

In addition, there are other variables such as self-efficacy and modifying factors. The detailed framework for the HBM is shown in Figure 6.

The Progress of Parents' Behavior Change

In addition to the above literature review, one may also be interested in how parents might alter the way in which they handle their children's ICT usage in a practical manner. To do so, one must first investigate those factors that affect children's ICT usage as proposed by Bucy *et al.*, 2004. These factors may relate to social, cultural, and psychological. While the Trans-Theoretical Model is the best fit for a wide range of problem behavior such as cessation of smoking, quitting cocaine, and weight control (Lenio, 2006), this study applies both aforementioned factors as well as the TTM to develop a "Permeability of Change Model" (Figure 1) which best describes the progress of parents' behavioral change.

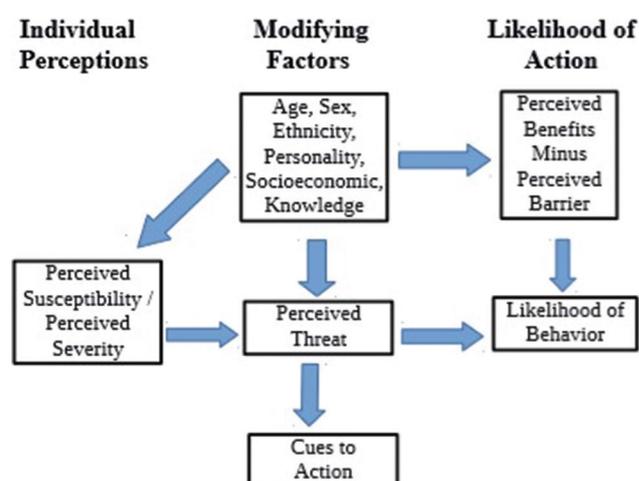


Figure 6: Framework for Health Belief Model (HBM). Sources: Stretcher, V., Rosenstock I.M. (1997). The HBM. In Glanz K., Lewis F.M., and Rimer., (Eds.). Health Behavior and Health Education: Theory, Research and Practice. San Francisco: Jossey-Bass

Table 3: A summary of various therapies at different levels of change

Levels	Pre-contemplation	Contemplation	Preparation	Action	Maintenance
Symptoms/situational	Psycho-educational interventions			Behaviour therapy	
Maladaptive cognition	Adlerian therapy	Cognitive therapy rational-emotive therapy			
Interpersonal conflicts	Sullivanian therapy	Parents communication transactional analysis		Interpersonal therapy	
Family systems	Strategic therapy	Bowenian therapy	Solution-focused	Structural therapy	
Intra-personal conflicts	Psychoanalytic therapies	Existential therapy	Gestalt therapy	Brief-psychodynamic therapy	

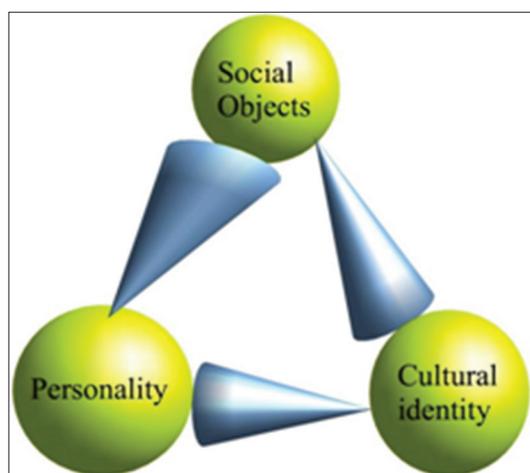


Figure 7: One step approaching the philosophy of digital equity: The relationships between the social, cultural, and psychological factors of children's ICT usage

Factors Affecting the ICT usage of Digital Equity

There are several factors – social, cultural, and psychological which affect the ICT usage of children. Therefore, it is interesting to study these factors and hence discover ways to change the present phenomenon. This research will discuss them in the following sections. Figure 7 shows how the social, cultural and psychological factors are correlated together.

Social Factors

The social factors of children's ICT usage at home are all things that have effects on one's lifestyle, such as religion, wealth, or family.^[5] In the case of digital equity, one can usually refer to the social factors of age, culture/social participation, education level, family structure, gender, geography (rural-urban location), income, socio-economic status, and ethnicity (Yu, 2006: p. 240241). In Hong Kong's case and for the present study, this author suggests that age, geography and ethnicity are minor factors. Pak (2012), references home ICT use, saying that parents are always likely to get involved with their children's online lives. This is the result of the complex components of family

practices such the family's socio-economic status, parents' aspirations, parents' education levels and parenting styles that, all constitutes one's ICT usage (i.e., why and how to use ICT) at home and hence determines the outcomes. Parents' social factors also influence the progress of changes in handling children's ICT usage requests. This author believes that families with better social backgrounds are more open to adopt changes.

Cultural Factors

According to Cheng (2015) school principals' culture and values concerning ICT are the key cultural factors in schools that affect students' amount of ICT usage. Parents' demanding values have an influence on home culture and a harmonious parent-child relationship also has an effect. All of the above induce what one may call a cultural divide. To overcome it, there are several strategies as suggested by Cheng (2015). Certainly, one might comment that the use of educational ICT should be added to the cultural dimension of digital equity. This author believes that cultural factors in Hong Kong are important when studying local students' ICT usage. They do influence the parents' progress of transformation in handling children's ICT usage. Parents need to be aware of the errors in the common culture of handling ICT usage before change can take place.

Psychological Factors

Concerning the psychological factors of children's ICT usage, one can refer to motivation and meaningful usage (Adhikari, 2013). This author also thinks that there is a strong relationship between personality and motivation. This is known as neuropsychology (Corr *et al.*, 2013). Jean Piaget (1896–1980) developed the Constructive Learning Theory, stating that most children can learn in a more effective way from active design as well as meaningful projects' development (Vogel-Walcutt *et al.*, 2011). Students actively

construct new knowledge and get deeply involved in the learning process. They can also get better academic results and become motivated to acquire further knowledge through the community or with family support. In addition, equity is defined as a meaningful use of ICT tools by learners. It is therefore important to focus on how these technologies are used. In other words, whether they are being used wisely or in an unproductive manner (Adhikari, 2013). This author believes that, these psychological factors are significant in the parent's transformation after they have learnt how to aid with their children to use ICT effectively and actively.

Application of Trans-theoretical Model to Parents' Behavioral Change

TTM is best fitted to describing a behavioral change and can be applied to the present research. According to TTM, the first stage of change for parents is that they are not aware of the necessity to change behavior. When they start to face problems with ICT usage, they begin to aware of the problem and try to overcome them without a solid commitment. Next, parents learn both mediation and school-family partnership philosophies from education courses. They take actions to transform their behavior. Hence, this leads to making the necessary modifications to overcome their problem. The stage after sees parents tries to prevent a relapse and maintain the changes. Finally, parents complete the change and maintain it constantly. This author relates section 3.1 and 3.2 together to construct "Permeability to Change Model" for parents' manner to handle children's ICT usage in the next page.

DISCUSSION – ASSISTANCE (DIFFERENT THERAPIES) FOR LEVELS OF CHANGE TO PARENTS

To achieve transformation in the culture of handling children's ICT usage, there needs to be different levels of change for parents. Amongst these levels of transformation, one can seek assistance to help promote change. In fact, the assistance comes in the form of various types of therapy for parents at the different levels to encourage transformation in handling children's ICT usage. This study will discuss these in the following paragraphs and use a hypothetical family case study as an example.

Table 3 summaries the various types of therapies for the different stages of change among parents. To begin with, the first visible level concerns symptoms and situational problems. This is the preferred starting point for the trans-theoretical approach (Schneider, 2003). At this elementary level, the reason children and parents participate in therapy are because they argue frequently. This means that one side is in a state of despondency or showing a tendency to be easily annoyed. One side is withdrawn and refuses to talk to the other (Schneider, 2003). For instance, a child has been playing an Internet-based game for a few hours on a tablet computer and his mother tells him to stop. The child refuses and the situation deteriorate further when the mother confiscates the tablet. The argument only ends when she decides to leave the room for fear of the action leading to physical violence. In this situation, and at this level, psycho-educational interventions and behavior therapy for the family could be introduced.

The second level concern, maladaptive cognition. This applies to those who are unsuccessful at transforming at the first level. At this level, it is possible that change can be happen in a relatively short period of time and psychological suffering can be relieved (Schneider, 2003). Hence, the tendency of intervention to change will be more productive if one decreases maladaptive cognition. When the parent and child are at this level, they may respond to positive action initiated by the other. While at the same time, each negative action is manifested through enduring personality flaws (Schneider, 2003). Adlerian, cognitive, and rational-emotive therapies are needed at this level of change.

The third level involves one's current interpersonal conflicts (Schneider, 2003). When violence has occurred between parents and their children, family therapists must intervene. In this example, the mother wants to stop her child playing Internet-based games and get back to studying immediately. She even confiscates the tablet from her child. Sullivanian therapy or Parental Communication Transactional Analysis and Interpersonal Therapy (Schneider, 2003) is required in such case at this level.

The fourth level concerns family system conflicts. The family is in conflict because of ICT usage (Schneider, 2003). From the parent's perspective, they want their child to use ICT related technology for educational purposes in an effective manner

such as web searching. However, the child is using technology for entertainment and even worst, is abusing it and playing games all night. As a result, other family members might not be able to gain access to the computer or may be disturbed by the game. Intervention at this level is solution-based and includes Bowenian therapies which are strategic and structural (Schneider, 2003).

Finally, the last level of change involves intra-personal conflicts. There is a little amendment to change and more time is required for transformation. However, one can solve extremely persistent and resistant problems (Schneider, 2003). At such a level, inner conflicts between the parents and children are in repeating self-defeating cycles. In the example, the inner conflicts among the different family members about the usage and disturbance of ICT technology occur every-day with duplicating cycles. Interventions at this level are psychoanalytic, existential, gestalt, and involve brief-psychodynamic therapies for the family to encourage permanent transformations in handling the child's ICT usage.

This author believes that promote effective and long-term changes among parents, they require different forms of therapy at various levels. Intervention is thus required to solve the different types of conflicts amongst the family members. This might result in influencing the students' culture and ICT usage atmosphere in such a manner that they will be affected to use ICT in a more effective. Besides the parents' influence, one may also be interested in the children's daily ICT usage. This study proposes that their usage is highly related to social, cultural and psychological factors. In the conclusion section, this author develops a step approaching to philosophy. In doing so, one can see the full picture of the digital equity problem^[6-32].

CONCLUSION – ONE STEP APPROACHING THE PHILOSOPHY OF DIGITAL EQUITY

How should children be encouraged to use ICT effectively? The parents' means of handling their children's ICT usage requests is also important. Therefore, how one changes their beliefs and values is essential for the present research. It is important to investigate the parents' behavioral changes through different behavior theories and models. The best one being the "Stage of Change

Model." In addition, those who are unsuccessful at changing their behavior by themselves would benefit from receiving some form of therapy to better handle the ICT requests of their children. If one wants to depict children's ICT usage, one should focus on the social, cultural and psychological factors which can be further developed towards a philosophy for digital equity as described below.

As proposed by Roger Penrose's Three World philosophy for the foundation of mathematics, there are connections between the Platonic mathematical world and the physical world and the mental world. These worlds are then arranged in a triangular configuration with cones linking them. The physical world is governed by the Platonic; the physical induces the mental; the mental is concerned with the Platonic and so on. For instance, one could use their "consciousness to discover various mathematical structures and to understand their various relationships with each other, that is, when one does mathematics, one is really using their consciousness to access this 'other world' of eternal mathematical structures."

There are those who have commented on Penrose's philosophy saying that the laws of physics may not be consistent with mathematics nor is it a proper language for describing physics. One can perfectly imagine that consciousness is not "tied down to a physical embodiment."

This author suggests that there is one step approaching the philosophy of digital equity – the social, cultural, and psychological factors regarding children's ICT usage which correspond to the Platonic mathematical, physical, and mental worlds of Penrose's philosophy. In fact, this study suggests that one may consider those social factors of children's ICT usage as the objects of digital equity. This author also notes that one may refer to technology as objects with specific reference to the Actor Network Theory (Michael, 2000; Latour, 2005). In other words, one may be able to consider technology such as computers as a "black box." According to Derksen and Beaulieu in 2010, there are different versions of humanness and sociality products which usually have distinctly unnatural and heterogeneous practices. This can be called as "Social Technology" since they raise the problems of social specificity (Derksen and Beaulieu, 2010). Considering the above, this author proposes that one can consider social factors as black boxes in

digital equity like those objects in technology. Thus, it is proposed that social factors are indeed the Platonic mathematical world (objects or structures) of digital equity. For example, with the gender (social) factor, boys, and girls are the required social objects, or structures, of digital equity.

When the cultural factors of digital equity are considered, this author suggests that one should refer to the students' identities, or their cultural identities, in accessing and using digital technology. This means that one should focus on "how students' unique cultural identities affect their technology access and use." (Probst, 2012:1298) To be more precise, minority groups of students usually suffer from shortage of software and online content in the form of their cultural experiences or native languages (Lazarus and Lipper, 2003). For example, during a student's search for information on the internet, their native language is the most determining factor (Kaigo, 2002). With English being the most dominant language on the internet, one's ability to understand and process English is a significant factor when access text-based information. Indeed, if the web content a child accesses can be translated to their native language (Hong Kong's case - traditional Chinese), then it will be easier for them to comprehend the information (Kaigo, 2002). From the above evidence, this author proposes that students' cultural identities when accessing and using digital technology correspond to Penrose' Three world philosophy as physical world.

Finally, the student's personality when using ICT plays a significant role in the mental part of Penrose's philosophy. To analyze the relationship between personality and Internet usage, one must first understand the big five personality traits or — the Five Factor Model (FFM) (Costa and McCrae (1992):

1. Neuroticism: This captures several types of negative effects and includes anxiety, vulnerability to stress, depression, and self-consciousness
2. Extraversion: This includes traits such as positive effects, energetically approach activities, sociability, assertiveness, and talkativeness
3. Conscientiousness: This refers to those who strive for achievement, self-discipline, dutifulness, and order

4. Openness to experiences: This denotes a trend in curiosity for the inner and outer worlds, a will to entertain novel ideas as well as unconventional values and broad interests
5. Agreeableness: This expresses interpersonal tendencies such as flexibility, tolerance, compliance, altruism, cooperation, and trust.

Amichai-Hamburger and Ben-Artzi (2003) stated that males who were neurotic and extroverted liked to use the internet for information and leisure services. While females who were neurotic and lonely preferred to only use the internet for social service. In the study of openness, conscientiousness and extraversion, online gamers received higher scores in the above three categories than non-gamers but with no difference to agreeableness or neuroticism (Teng, 2008). According to Karim's research, agreeableness, conscientiousness, and emotional stability are negatively correlated with unethical Internet behavior.

To conclude, a student's personality is related to their ICT usage. Hence, psychological factors personality matches with Penrose's mental world in his Three World philosophy. Indeed, whether one can apply FFM across different cultures is still under debate (Jin, 2009). Most Western psychologists accept FFM and even with Chinese students, FFM generally holds true.

However, some cross-cultural psychologists have tried to compare indigenous personality structures with FFM. For example, Jin (2009) investigated "the culture-relevance and culture-uniqueness between the imported and the indigenous ways" (Jin, 2009. p.15). Therefore, this study constructed the diagram below to explain the philosophy of digital equity:

This author believes that there are relationships between the social, cultural, and psychological factors of children's ICT usage. It is still our interest to investigate these connections, to further understand ICT usage. In fact, the proposed philosophy is only the starting point, this author hopes that there will be more research and new theories developed concerning digital equity in the future. Rather than these factors, this author also discover that it is natural if too much control in child's ICT usage by parents will lead to rebel. The result is a management risk. In such case, professional intervention may be needed just like those stated in the discussion section. Indeed, the key is to raise children's passion in learning. Together with the parents'

Permeability Change Model and the Philosophy of Digital Equity, one can eliminate the non-effective use of ICT and attain positive academic achievements.

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