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Weizhen Lei
Department of Information Systems The University of Melbourne Victoria, Australia, wlei@pgrad.unimelb.edu.au

Martin R. Gibbs
Department of Information Systems The University of Melbourne Victoria, Australia

Shanton Chang
Department of Information Systems The University of Melbourne Victoria, Australia

Heejin Lee
Graduate School of International Studies Yonsei University, Korea, heejinmelb@yonsei.ac.kr

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Weizhen Lei
Martin R. Gibbs
Shanton Chang
Department of Information Systems
The University of Melbourne
Victoria, Australia
Email: wlei@pgrad.unimelb.edu.au

Heejin Lee
Graduate School of International Studies
Yonsei University, Korea
Email: heejinmelb@yonsei.ac.kr

Abstract

In discussing and planning interventions around the "digital divide" people tend to think in terms of the binary oppositions of "digital-haves" and "digital-have-nots". Information and communications technologies (ICT) programs sponsored by governments and other agencies to address the "digital divide" also tend to be "top-down" initiatives that focus on the provision of institutional aid and the development of infrastructure. Within these approaches ICT have-nots tend to be treated as the passive receivers of aid. The agency of digital-have-nots in gaining access to ICT has been rarely examined. In this paper we report on a study that has shown that ICT use patterns amongst those with poor access and utilization of ICT is diverse and complex. Results from a survey of 495 rural-urban migrants in Beijing show that self-initiated digital transition exists among this group of people. The transition from digital-have-not to digital-have is not a one-step process but rather an incremental process with multiple stages and multiple pathways. Findings from this study will provide helpful insights for policy makers and related stakeholders when discussing and planning ICT programs and activities designed to address the issues associated with the digital divide.

Keywords

Digital divide; Rural-urban migrants, China

INTRODUCTION

ICT (Information and Communication Technology) is pervasive and has penetrated diverse aspects of our daily work and lives (Lucas, 2008). ICT plays an increasingly important role in most societies; and our communication, sociality, entertainment, learning, community, work and various other activities depend on it, leading to a so-called network society (Castells, 2000). Furthermore, many studies have shown that ICT access significantly influences our ability to acquire other social resources, such as education, employment, financial support, political expression, and social position (Warschauer, 2003). As a result, the gap between those with good access to ICT and those with poor access has become an increasingly important issue. Some studies have addressed this phenomenon as a disparity between "digital elites" who gain significant advantages from ICT and marginalized 'digital-have-nots' who miss out on these opportunities (Yu, 2006). Van Dijk (2005) has also pointed out that pre-existing social inequalities are amplified by the unequal diffusion of digital media. In developing countries, particularly, this problem of ICT access has been more serious because of the polarization between the poor and the rich. Addressing digital inequalities is an important part of efforts to address social inequality and to improve the socio-cultural conditions of the impoverished. Studies of digital inequality in developing nations in particular are needed as the consequences of these inequalities are keenly felt by the disadvantaged in these countries (James, 2004; Liu & San, 2006).

Some governments and scholars have made efforts to alleviate digital inequality; however, most of them present, to some extent, a homogeneous perspective, which describes the uneven ICT access as a simplified binary divide, which can lead to immature academic conclusions (van Dijk & Hacker, 2003). For instance, discussions of the digital divide in both government surveys and academic studies often rely on a dichotomous classification of ICT "haves" and "have-nots". Others have defined the 'digital divide' as a situation where "ICT is distributed unevenly both socially and spatially" (Warf, 2001). In this paper we argue that what is lacking from previous work is a more sophisticated understanding of the digital divide that views it as a complicated zone of transition that runs from 'zero access', through 'a little access/use', up to 'some use'. This view of the digital divide as a

zone of transition has not been adequately articulated previously. As a result, current understandings of ICT disparities are incomplete and the impact of these digital inequalities on socially marginal population remains unclear.

However, a variety of solutions have been proposed to 'bridge' (Chowdhury, 2002; K. Clark, 2003; Lathchem, 2002), 'narrow' (Chen & Price, 2006; Paul, 2002) or 'close' (Kozma, McGhee, Quellmalz, & Zalles, 2004; Parker, 2000) the "digital divide". Most of these initiatives propose solutions to the problems of digital inequality based around the provision of infrastructure and institutional aid to digital-have-nots by governments and other agencies. Within these approaches digital-have-nots tend to be treated as the passive receivers of aid. We believe these existing approaches can be enhanced by improving our understanding of the agency of digital-have-nots and the mechanisms they use to acquire ICT and the effect of the transition to being digital-haves. These self-initiating factors have previously been rarely examined and largely ignored.

Current studies of the digital divide rarely refer to ICT adoption from the perspective of the individual, but tend to study the phenomenon at the collective level in terms of collective categories such as generations, nations, genders or classes (Kim & Kim, 2001). However, the process of digital transition should be studied at the individual as well as the collective level because the motivations of ICT adoption are based on individuals' experience (Selwyn, 2003; J. van Dijk, 2006). In addition, previous studies of the digital divide have been criticized for lacking rich, qualitative understandings of the precise mechanisms through which individuals, particularly members of marginal populations, cross the digital divide (J. van Dijk, 2006).

Aims of this study and research questions

The aim of this study has been to begin the process of rethinking the digital divide and generating new insights into the phenomenon by studying the experiences of rural-urban migrants in China who are in the process of effecting a transition from the condition of being digital-have-nots to the condition of being digital-haves. In our research we have been interested in alternatives to conceptualising the digital divide as a simple binary division. Adopting this alternative approach, we have investigated spontaneity in the process of digital transition among rural-urban migrants in China. Our aim has been to use our research outcomes to generate new ideas for addressing issues associated with digital inequality by seeking to understand how people begin the process of making the digital transition.

This paper intends to fill the two research gaps. A specific population of China, rural-urban migrants, was chosen as a study subject. Starting from a point of "have-nots", some rural-urban migrants have successfully made digital transition and become the ICT "have-less" in China (Cartier, Castells, & Qiu, 2005). However, the previous studies do not illuminate how the group makes the transition and the stages they went through in making the transition. Furthermore, the relative importance of institutional support and individual agency in making the transition were also not studied.

To explore the ICT usage among the rural-urban migrants in China, we propose the following research questions: **RQ1:** What are the ICT usage patterns among the rural-urban migrants who are experiencing digital transitions as "ICT beginners"? **RQ2:** Does self-initiated transition exist in the process of the rural-urban migrants' digitalization?

LITERATURE REVIEW

Current studies of the digital divide have tended to ignore a significant problem. Most of them have not addressed the characteristics of ICT beginners fully. Firstly, previous studies have tended to treat ICT have-nots as a single type rather than as a diverse group with diverse skills and access to ICT. Secondly, they tend to conceptualise the transition from digital-have-not to digital-have as involving a single step, or jump, rather than understanding it as a gradual and incremental process. This paper argues that both of the above flaws are a result of the prevalent binary classification of the digital divide.

Limitations in current definitions of the digital divide

Cisler (2000) questions the definition of digital divide by saying that in reality there is not a binary division between information haves and have-nots, but rather a gradation based on different degrees of access to IT. Thus, many other studies (Gunkel, 2003; Selwyn, 2003; van Dijk, 2006; Yu, 2006) also criticized the dichotomous terms of ICT "have" or "have not" for its crude analysis. ICT disadvantage is often simplified as only one "have-nots" group. Follow-up research, which aimed to seek solutions to the "digital divide", tended to ignore the varieties of people who have not used ICT or were just beginning to attempt it.

Van Dijk (2006) argued that current research on the digital divide has lacked "conceptual elaboration and definition", which has limited this study field. In order to clarify the concept, we have to answer the following questions: What do "haves" and "have-nots" refer to exactly? In what dimension and to what extent should the concept define "haves" or "have nots" exactly? In addition, is it possible to find anyone without any ICT

possession or access in the urban areas of most countries? Thus, defining and conceptualizing the huge groups of ICT non-users should be a precondition to start research on the issue of "digital divide". The current over-simplified definitions of ICT "haves" and "have-nots" is neither definite, nor helpful for making a reasonable framework for solving the digital disparity.

This study discusses alterations to current concepts. Firstly, the definition of "have-nots" seems to imply the population who cannot access the Internet. However, with ICT development, the notion of "have-nots" has acquired new characteristics such as indirect ICT utilization. For example, James (2004) found that illiterate people in India benefit from the Internet indirectly, without any direct use of computers and Internet connectivity. It is because intermediaries transfer relevant parts of the knowledge available from the technology to recipients in a form that is relevant to their specific demands. In these conditions, definition of "ICT have-nots" becomes more complicated.

Some academics contend that the "digital divide" should be defined as a series of dynamic continuums (van Dijk & Hacker, 2003). They suggested that the disparities in the ICT use should be examined across various dimensions such as "skills, literacy, mental access and types of usage". Rice & Katz (2003) propose a sophisticated pattern of hierarchies to explain the extent of ICT users' use of various technology applications. Additionally, Kim and Kim (2001) have given a detailed structure to classify the digital divide into multi-dimensional (media accessibility, information mobilization and information consciousness) and multi-staged (opportunity divide, utilization divide, reception divide) disparity. From the above perspectives, the "division" within the concept of "digital divide" was not defined as a binary gap, but as a successive process, depending on diverse social and individual variables. Contrasted with the notion of a binary divide, it may be argued that these ideas seem to provide a better depiction of the digital divide phenomenon.

Nevertheless, little research on digital divide issues has specifically focused on the stage when people begin the process of adopting and using ICT. The initial stage of digital transition is more difficult for the ICT beginners when they have no idea about ICT. Current studies have also examined the disparities among ICT non-users in terms of a stratified structure. For example, the Pew survey of US Internet users clustered non-users and users into "evaders", "dropouts", "intermittent users" and "truly connected" (Lenhart et al., 2003). Wyatt (2003) also divided ICT non-users into "resisters", "rejecters", the "excluded" and the "expelled". However, all these classification schemes only consider ICT non-users as a broad category and most of the populations identified had some form of competence or exposure to ICT such as the "evaders", "dropouts" (Lenhart et al., 2003) and "rejecters" (Selwyn, 2003). The absence of studies focused exclusively on the ICT beginners means that the sophisticated features of this group remain fuzzy. That is, although some research has investigated the conditions of ICT non-users, how ICT beginners make their initial steps from non-users to new or novice users is under-examined. Exploring the first steps in ICT have-nots' transition process is an important task in seeking ways to understand and address the digital divide.

On the other hand, some researchers have proposed modified concepts to replace the "digital divide", which include "information rich" vs. "information poor"; or technology "have-nows" vs. "have-laters" (Boaz, 2004). DiMaggio and his colleagues (2001) even argue that academics should shift attention from the digital divide to "digital inequality" since the rates of Internet diffusion have increased.

Digital inequality modifies the definition of digital divide by adding non-technological factors to physical availability of computers and connectivity. However, the concepts of digital divide and digital inequality both lead to similar thoughts for solutions, such as "bridging"(Chowdhury, 2002; K. Clark, 2003; Lathchem, 2002), "narrowing"(Chen & Price, 2006; Paul, 2002) or "closing"(Edwards-Johnson, 2000; Kozma et al., 2004; Parker, 2000) the gap. From this perspective, two key points can be reasoned:

Firstly, according to ICT use conditions, people can be divided into two distinct groups and there is a clear, single, binary gap between them. That is, while some academics have realized that the binary definition of "digital divide" underrates the variety and sophistication of the ICT beginners, they still keep adopting the binary structure when thinking about solutions.

Furthermore, notions of "bridging", "narrowing" or "closing" the gap present a similar perspective, which assumes the ICT "have-nots" themselves play a small role in the changing process and usually depend on institutional intervention. This research status quo is not beneficial to plenty of endeavours of alleviating ICT disparities. Consequently, this study contends that the ICT beginners' individual experience should be re-examined as a dynamic process with more detailed observation and a broader range of factors should be considered.

Current ideas for solving the digital divide

There are different schools of thought in analysing the solutions to the issue of digital inequality. Houston and Erdelez (2002) make an exploratory content analysis about 269 English language articles offered by connected stakeholders, which suggest various kinds of solutions to close the digital gaps. They found that 20 articles,

5.4% of the whole 269 articles, suggested no intervention should be made to bridge the digital divide. From the standpoint of the non-digital business community, no gap exists and nothing needed to be done to narrow the "digital divide", because it is was a natural phenomenon, "impossible to correct or insignificant in impact" (Houston & Erdelez, 2002). Others claim that the digital divide will be self-correcting with the development of ICT. For instance, some analysts have argued that these gaps will narrow naturally as a consequence of marketplace dynamics, such as decreasing price strategies (Mason & Hacker, 2003).

Houston and Erdelez (2002) analysis shows that most of the suggested solutions have focused on changing people's situations in the areas of Internet connectivity, educational content, user education, socioeconomic statues and culture. In addition, governmental policies, such as promoting new equipment, training digital industry workers and altering Internet content, have been proposed frequently by other academics (Hongladarom, 2004; James, 2005; Parayil, 2005)
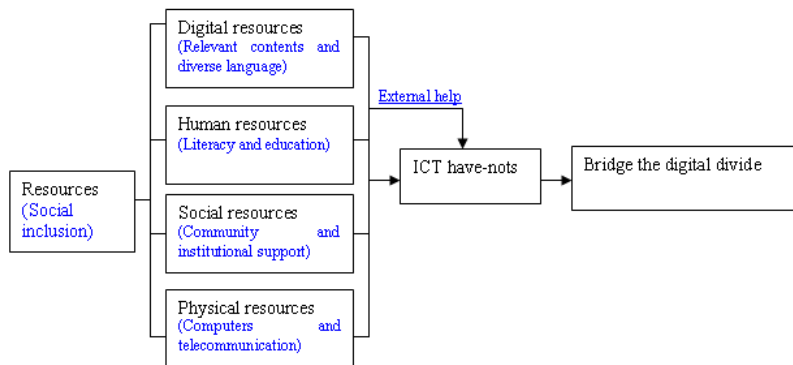

Figure 1: A Current Prevalent Model of Helping the ICT Have-Nots

As a whole, current research has shown two distinct schools of thought about how to deal with the digital divide. One school has argued to do nothing, and wait for self-correcting. The other has proposed to adopt interventions. It is obvious that most of the suggested solutions, plus many academic studies, have addressed the question of interventions by proposing external help or aid. Much of the previous research has discussed this issue through a similar approach: implementing a project, making a governmental policy, or setting up tele-centres and then examining their influence on the ICT have-nots (Mutula, 2005). From this perspective, for instance, "social inclusion" (Warschauer, 2003) becomes a typical solution model for "bridging" the digital divide. According to the theory of "social inclusion", apart from technology, additional factors, such as digital, human, social and physical resources are also involved and need to be addressed. All these factors are assumed to play a crucial role throughout the digital transition. Figure 1 illustrates Warschauer's (2003) model.

The divergence in opinion between treating the digital divide as a naturally self-correcting process, and as a binary gap that requires institutional intervention to correct, indicates that finding solutions to the problems of digital inequality requires further investigation. More empirical evidence is needed to support the position that the digital transition of ICT have-nots is a naturally self-correcting process. On the other hand, for the type of social inclusion approach, there are other limitations:

1. Social inclusion stands for the approaches based on the assumption that people are classified into binary groups. At least, it does not elaborate on the variety of the ICT beginners, but rather deals with all the targets of social inclusion as one simplified group. However, the structure and characteristics of the ICT disadvantage are under-presented, which has been discussed in the previous section.

2. This type of approach usually has a static model, which implements institutional interventions from the top-down. However, this model has to answer the following questions: Are there any additional, feasible ways for digital transition to occur other than with external aid? Why are the ICT disadvantaged always assumed to be passive subjects awaiting aid? Because investigations have been rarely been conducted on ICT beginners, their active motivation and other voluntary characteristics tends to overlooked or over-simplified.

3. Interventions to narrow the digital divide are usually made by way of external input. Accordingly, some academics doubt whether extensive, external aid is effective. For example, "dropped in" methods (Marshall, Yu, & Taylor, 2006) advocate various types of external help for a specific population, but without any accompanying measures of training or education. Some case studies in under-developed regions have shown that this "dropped in" method can seldom be sustained because it might not meet ICT have-nots' demands (Marshall et al., 2006).

In sum, due to lack of understanding about the ICT beginners, previous research on the solutions to digital inequality tend to have the above limitations. However, just as Freire (1993) has demonstrated, when the

interventions are relevant to the demands of the aided subjects and the local social conditions, they can be most effective. It implies that the demands of the aided subjects can influence the effect of external impetus.

Rural-Urban Migrants in China

The phenomenon of rural-urban migration is common to most developing nations. Millions of rural-urban migrants comprise the main part of the "information have-less" (Cartier et al., 2005) in developing countries. These "trans-local" migrants within China are called the "floating population" in academic research, which refers to its mobility and size (Bongvarts et al., 2002; Bonnin, 2000).

The emergence of the floating population is attributed to the unique household registration system in China called "hukou", which fostered a deep divide between urban and rural areas in China (Christiansen, 1990) The labour market in urban areas encourages peasants to choose trans-local migration, despite the fact that that they are treated as "hardworking, tolerant, cheap and disposable" labour (Zhou, 1998). They are the lowest stratum of the urbanite classes in China.

Due to weak affiliation with the state and other forms of institutional support, rural-urban migrants rely on their primary social networks for information and job opportunities (Solinger, 1999). In recent years, more rural-urban migrants have intentions of settling down in cities, but the migrants are still "not integrated into urban society"(Li, 2006) in many respects. Rural-urban migrants form a large part of the ICT have-less in China, and they are the "most under-recognized" group in terms of ICT developments in China (Cartier et al., 2005).

The floating population connects the urban and the rural areas, which symbolizes a hub of the process of frog-leaping ICT development. To study the solutions to digital inequality, they are ideal subjects. Furthermore, due to the lack of institutional aid and measures in China, the rural-urban migrants live in a market environment, struggling to upgrade their own ICT access. So their digital transition in a mechanism of spontaneity may be observed.

METHODOLOGY

To address the questions, a questionnaire survey was conducted amongst rural-urban migrants in China in November of 2006. In the survey, key questions, encompassing the quantity and quality of digital device possession and usage patterns, were asked. Other questions addressed factors such as whether there was a monthly fee, frequencies of access, skill acquisition and learning, and other trends of low-end digital media.

Due to the financial and time limitations, the questionnaire was conducted in one city, Beijing. As the capital of China, Beijing is where the rural-urban migration is taking place on the largest scale. It should be a qualified as a typical case for examining the whole group. The survey adopted a method of stratified sampling that "increased the precision of the sample" (Moser & Kalton, 1979, p. 165) based on known information of the population. Rigour in our quantitative sampling was obtained by stratified sampling (Groves, 2004), which was used to compensate for sample size limitations through a "quota system" (Bulmer & Warwick, 1983, p. 163). According to the data from the Beijing government (2004), the researcher stratified the rural-urban migrants into 8 groups according to their occupation, age, resident zone and gender. Three districts were chosen for survey: Haidian, Chaoyang and Fengtai where 51.5% of the rural-urban migrants of Beijing concentrated.

More than 20 experienced interviewers were recruited from the University of Beijing. A training session was organized to explain the details of this survey, including the content, subject, interviewees and requirements of the survey. During the session, mock-interviews were conducted as practice exercises. The interviewers were also shown several examples of completed surveys that had been conducted by the researchers. 521 copies of the questionnaire were carried out within 3 weeks and 495 valid samples were collected. Most of the subjects were visited in their work locations and in open public spaces.

RESULTS

1. Complicated and mixed patterns of ICT usage amongst the migrants

To depict the ICT usage patterns of the rural-urban migrants, three indexes were chosen: frequencies of Internet access, the adoption of Internet functions (such as email or games) and possession of mobile digital devices.

The data showed that only 7.1% of the rural-urban migrants accessed the Internet everyday; 13.4% accessed it 3-4 times per week; and 23.2% accessed the Internet every few weeks. Among the Internet non-users, those "knowing what the Internet is" occupied 27.8% of the whole responders and 28.5% responders "knew nothing about the Internet at all". The result showed diversity existed in regard to the frequency of Internet use and access. Even amongst Internet non-users, the conditions of IT knowledge were varied.

Among the 215 Internet users in the samples, the functions they often used were also varied. Online game playing and web browsing were used most frequently, comprising 65% and 64.5% of the Internet users subset

respectively. Communication function, including types of net-chat, was found to be popular among the migrants. Other functions, which required higher literacy, such as the use of search engines, BBS and e-commerce, were used less frequently. This result suggested that the rural-urban migrants tended to use ICT for entertainment, which also included the fun of communication. However, the data showed those among the migrants who were male, below 30 years old, or above "junior high school" educational level used the non-entertainment functions more frequently. That is, among the ICT beginners, the adoption of digital devices (hardware) and functions (software) were not consistent. With regard to ICT use by rural-urban migrants in our sample the migrants presented as sub-groups with hierarchies, rather than as a simple pattern.

When other related digital equipment was included in the research framework, the digital disparity among the rural-urban migrants presented an even more complicated pattern. Among the possession and use of mobile phones, PHS (Yuan et al., 2006), Personal computers and a fixed phone at home, the variation among the "veteran", "recent users" (Rice & Katz, 2003) and "non-users" could also be observed. The outcome showed that mobile phones have been popularized among the migrants. With respect to the possession of mobile phones, "veterans", recent users and non-users each represent one third of the whole group. In Beijing the market for low-end digital communication tools was well developed. A variety of mobile communication tools, including second-hand and outdated types, were affordable for the low-income population. Cheap text services for mobile communication tools were also a popular channel for migrants' communication (Jiang, 2003).

Mobile phones, PC, fixed phones at home, and other ICT services are booming in the big cities because of the floating population's demands. This showed more complex patterns if combined with other media possession or use together. For example, among the Internet users, 80.5% of them also possessed mobile phones, 18.1% of them possessed PHS, 19.5% of them possessed PC and 22.6% of them possessed fixed phone. However, among the media users, the usage frequencies or function choices were diverse as well. Classifying the possession and usage patterns for the digital beginners could be an arduous task.

Answer to the RQ1: The outcome shows that the distribution of ICT possession and usage among the migrants are scattered and not likely to be simply categorized. It is inappropriate to divide the "ICT beginners" into two groups named as ICT "haves" or "have-nots". However, through the data analyses, a process of incremental steps from "have-nots" (almost have no ICT possession and usage) to "have-few" (have very few low-end digital devices, access Internet occasionally and adopt basic entertainment functions of ICT), up to "have-some" (have some low-end digital devices, access Internet frequently and adopt more functions of ICT than entertainment and communication) can be found. Some rural-urban migrants' ICT possession and usage had reached a similar level to that of the average urbanites of modern cities.

Although the categories above are not precise enough and need more data analyses to support them, it is possible to argue for the need to re-examine the definition of digital divide. Even within a particular group of rural-urban migrants, who are in a situation of poor ICT possession and usage, sophisticated types are presented, so we cannot simplify the whole situation of the "digital divide" into 2 or 3 groups. This research has not reached the stage of being able to comprehensively describe the full usage patterns for the rural-urban migrants of China, but it has shown that it should be examined through a more dynamic and multi-dimensional framework.

2. The self-initiated digital transition does exist

Two main indexes were used to examine the situation of the self-initiated digital transition among the rural-urban migrants: The first was where and how they access the Internet in unfamiliar cities. The second was whether they had obtained any free training or other aid from the government or any other institutions.

The data shows that 43.7% migrants had Internet experience. Among the whole 495 responders, 93.7% migrants did not own hardware for Internet access at home and 88.7% migrants had no chance to use the Internet at work. Internet cafés were the main place where the rural-urban migrants accessed the Internet.

Furthermore, the data showed that only 5.2% of migrants obtained free training for Internet use run by the government and only 3.7% of migrants used free Internet services provided by the city of Beijing. More than 80% of respondents were not aware of these services. The results indicated that most of the Internet users among the migrants learned their ICT skills through non-institutional channels such as Internet cafes.

The outcome showed that 67.6% of Internet users among migrants learned mainly from friends and colleagues. Only 22.8% of Internet users learned these skills from an institutional education system such as the schools of their hometown or in Beijing. 12.4% of users learned Internet skills from friends in Internet cafés whilst in Beijing. It was clear that most rural-urban migrants acquired the knowledge and skills of Internet usage through informal means.

Answer to the RQ2: Peer group learning is an important means for rural-urban migrants to acquire Internet skills. Help from the government, education institutions and the like were not a major source for acquiring these skills. Rural-urban migrants have the ability to learn IT skills from members of their own community. Self-

initiated digital transition without government or institutional support from outside the community does exist amongst rural-urban migrants in China and these factors are the most important.

DISCUSSION

The results showed that most rural-urban migrants lacked digital possession and institutional support. However, a variety of ICT usages still existed among this population. The variation could be attributed to individual differences. Demographic factors such as gender, age, educational level, and occupation have been found to impact on people's digital adoption (James, 2004; Lenhart et al., 2003; van Dijk & Hacker, 2003; Warschauer, 2003). We also suspect that other factors, such as the economic situation of their hometown and the duration of their stay, influences digital adoption patterns amongst this population. It is evident that when researching digital divide issues, scholars should be careful in terms of treating certain social groups or classes as homogeneous subjects, ignoring the existing strata among them. The outcome of the survey in Beijing provides evidence that there is not a binary division between the digital-haves and digital-have-nots (Cisler, 2000), but rather a gradation based on different degrees of access to ICT. Also, the situation of rural-urban migrants is complex and further studies to examine variations in digital disparities are necessary.

In the digital transition process, complex gradational patterns of ICT possession and usage often emerge as a result of individuals' different self-initiated motivation and effort. Our study has shown that ICT have-nots are motivated to use digital devices. They have a certain competence to start using ICT gained through non-institutional means, even without owning any hardware. Informal learning through inter-group teaching and learning among the migrants appears to be an important channel for migrants' digital transition (Overwien, 2000).

The finding of self-initiated digital transition also implies that ICT use has become a basic or even essential tool in a digitalizing society. Capability of gathering, processing and using useful information becomes increasingly significant in a "wired society" (van Dijk, 2005). Information becomes scarce as a "positional good" (Hirsch, 1976) and those who have no position in the ICT network face social exclusion. Without more choices from institutional support, rural-urban migrants make self-initiated digital transition to some extent, which could be understood as a primary demand for "existence and development" (Qu, 2001) in their unfamiliar urban life.

These findings also imply that demands and motivations of the ICT have-nots should be emphasized in the studies of the digital divide. For example, an approach that provides help and resources for a specific population from external source outside the community, without accompanying those "dropped-in" resources with training or education, often occurs (Marshall et al., 2006). Many studies or cases for under-developed regions show that these "dropped in" attempts to bridge the digital divide can seldom be sustained because they do not meet the demands of the community (Marshall et al., 2006). This has also been demonstrated by Freire (1993) who showed that literacy instruction is best received by learners when it involves content relevant to the local's needs and social conditions. Our study also suggests that consideration of individual agency in effecting digital transition is important in any approach to the digital divide and non-institutional factors should be considered more in future work on finding solutions of the digital divide.

LIMITATION AND FURTHER RESEARCH

Due to limitations of funding and time, our survey only sampled 495 people in Beijing. Various developmental levels and cultural features among different cities may influence the rural-urban migrants' digital transition. Therefore, further research should analyse more cities and take other factors into consideration.

This paper is the first step towards understanding self-initiated, digital transition processes among ICT have-not populations. The survey confirmed the existence of the phenomenon. Further research is needed to understand these processes and how to apply this knowledge in ICT development initiatives and programs. Explaining how and why rural-urban migrants make these digital transitions will be a valuable follow-up study. Further, we studied the ICT have-nots as a collective population. However, individual factors such as motivations for adopting ICT, prior ICT experiences, and educational levels may all have an impact on the process of self-initiated digital transition. Future research should explore the phenomenon at the individual as well as the group level.

CONCLUSION

Like many people in developing nations, rural-urban migrants in China rarely receive external support such as free or subsidized training and education, provision of devices from governments or other agencies to help them access digital technology. The results from this study have shown that despite the lack of external institutional aids the rural-urban migrant population is able to make the transition across the "digital divide" through the utilization of a range of low-end digital devices. These findings suggest that we consider the "digital divide" to be a linked set of digital disparities, and as a continuum rather than a dichotomy.

Our study also suggests that efforts to address digital disparity can be enhanced by acknowledging and considering the agency of ICT have-not populations and the mechanisms they use to acquire ICT. We hope that these findings will inspire policy makers to explore a broader range of approaches to solving problems of digital inequality, such as developing and enhancing low-end digital services and facilitating spontaneous and self-initiated transitions across the digital divide. This "bottom-up" approach to the "digital divide" could prove to be an effective and an economical strategy.

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