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# **Determinants of User Satisfaction in Internet Use among Socio-Economically Advantaged and Disadvantaged Groups: The Role of Digital Access and Government Policy<sup>1</sup>**

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## **Abstract**

Digital divide is one of the most concerning issues today. It positions those who ‘have-no’ access to technology at disadvantage socially and economically. The key to reduce digital divide is to provide access to basic technology and information content. This study explored the role of government policy support in affecting digital access which in turns determining user satisfaction toward Internet use. A large data set that was provided by the Korea Information Society Development Institute confirmed the existence of digital divide in South Korea along the line of education and income. The proposed research model was tested using survey data of 233 socio-economically advantaged (SEA) individuals and 319 socio-economically disadvantaged (SED) individuals. All hypotheses were supported with the exception of the relationship between policy support and social access for the SEA group. The study has implications on how governments should devise policies to facilitate technology and social access for different socio-economic groups within the country.

**Keywords:** Digital Divide, Digital Access, Government Policy, Socio-Economically Disadvantaged, Socio-Economically Advantaged

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## **Introduction**

From the socio-economic perspective, information and communications technology (ICT) development is a salient component that underlies the growth of a society (Frieden, 2005). It changes people's lifestyles and influence their sense of well-being. While beneficial, ICT growth carries with it a critical and complex form of inequality that put those who "have-no" access to technology at disadvantage. This phenomenon of inequality is widely-known as digital divide. Today's network society continues to widen this digital divide gap, and further deprives the disadvantaged of various opportunities.

Over the past two to three decades, many countries have initiated public agenda and policies to address digital inequality problem in an effort to improve the degree of national compatibility in ICT. The first stage of the government initiative focuses on ICT infrastructure development, and the second stage is to build a national-level ICT ecosystem. An ICT ecosystem refers to a total value chain in the ICT industry, which includes telecommunications networks, broadband Internet, software and content, and ICT products and services (Shin & Kweon, 2011). Government projects pertaining to national Internet infrastructure are underway in many countries, for example, Singapore's "Intelligent Island", Malaysia's "Multimedia Super Corridor", USA's "Global/National Information Infrastructure", Canada's "Information Highway", and South Korea's "IT839" projects (Shin & Kweon, 2011). Clearly, governments play a significant role in ICT development (Frieden, 2005; Shin & Kweon, 2011). They establish visions and strategies, invest in ICT infrastructure, encourage digital literacy, aggregate demands, foster facilities-based competition, provide incentives to encourage private investments, and promote universal services (Frieden, 2005).

Among the countries that invest in ICT infrastructure projects, South Korea is considered one of the most successful countries. It ranks top on 2012 ICT development index (ITU, 2013). Its' ICT industry contributes to 9% of national GDP in 2012 (MSIP, 2013). ICT projects in South Korea not only focus on infrastructure capability but also on applications, services, and content/media development (Frieden, 2005). Research found that Korean government's policy and initiatives are the most important aspect that facilitates ICT incubation in the country (Frieden, 2005; Shin & Kweon, 2011).

However, behind the advancement of ICT development and incubation in South Korea, digital divide continues to exist. Blanket policies are often adopted based on the assumption that all citizens, regardless, of their socio-economic status, will respond to the same technology in similar ways (Hoffman et al 2000). However, this is not the case. In comparing continued use intention of the socio-economically advantaged (SEA) and socio-economically disadvantaged (SED) groups on a government Internet TV initiative in USA, Hsieh et al. (2008) found that the two groups responded differently on their level of perceived behavioral control, self-efficacy, availability, and perception of hedonic outcomes. In Europe, Aerschot & Rodousakis (2008) found that digital divide produces barriers for the SED such as a lack of motivation, skills, financial resources, and awareness of e-service in eGovernment initiatives. Aerschot & Rodousakis (2008) contended that policy-related issues should be considered when studying digital inequality at individual level. Following this, we propose that the SEA

and SED will have different perception toward government policies which will in turn influence their perception toward technology and social access of ICT, and ultimately their satisfaction level.

The aim of this study is threefold. First, we verify the existence of digital divide in South Korea using the 2012 media panel data provided by the Korea Information Society Development Institute. Second, we empirically test the role of government policy in affecting social and technology access using another set of survey data. Third, we investigate the moderating effect of socio-economic status to understand its impact on citizens' satisfaction toward Internet use.

## **Literature Review**

### ***Digital Divide and Digital Access***

Digital divide refers to “the gap between individuals, households, businesses, and geographic areas at different socio-economic levels with regard both to their opportunities to access ICTs and to their use of the Internet for a wide variety of activities” (OECD, 2001). The key to reduce digital divide is having ‘access’ to ICT (Chang et al., 2012, 2014; Chen and Wellman, 2003; Van Dijk, 2006). Chang et al. (2012, 2014) classified digital access into four facets: social, technology, skills, and motivational access. Technology access refers to “user perception toward the availability and accessibility of various ICT infrastructure”; social access is “user perception toward the extent of affordability and availability of Internet contents”; skills access is “user perception of his or her own ability and confidence to use computers and the Internet”, and motivational access refers to “user perception of productivity and pleasure of using ICT” (Chang et al. 2014). Of these four types of access, the most fundamental ones are technology access and social access. Technology access and social access originate from external environmental factors (Chen and Wellman, 2003) and will influence user satisfaction of Internet use (DeLone and McLean, 1992). As social access and technology access become more readily available, the citizens will have higher satisfaction toward Internet use. Availability means ease of access. When technology and social access are available, the effort needed to use these ICT becomes easier. This affects the level of satisfaction. Therefore, we propose,

***H1: Social access will positively influence satisfaction.***

***H2: Technology access will positively influence satisfaction.***

Previous research (e.g., DeLone and Mclean, 1992; Wixom and Todd, 2005) found a positive relationship between systems quality and information quality. Information content requires the support of proper ICT infrastructure before the contents can be shared and used. The more available the ICT infrastructure is, the more people will perceive the contents to be accessible

(Chang et al., 2012; 2014). Following the literature, we propose that technology access will positively influence social access.

***H3: Technology access will positively influence social access.***

### ***Government Policy Support***

Government policy support is a salient factor that facilitates a country's ICT capability and the people's adoption of ICT (Pick and Azari, 2008; Shin and Kweon, 2011). In fact, the first Internet technology also originated from government effort, i.e., the US ministry's defense project called "Advanced Research Projects Agency" (Marson, 1997). Since then, governments of different countries have rolled out different ICT projects to push forward their ICT industries (Shin & Kweon, 2011). In a study of 184 general users and non-users of ICT, Verdegem and Verhoest (2009) found that policy support is important to those who are at disadvantaged and reside at the bottom of the pyramid compared to those who are at advantaged position and come from higher-income group. Aerschot and Rodousakis (2008) contended that the SED is the most important group to focus on when studying digital divide issues because this group lacks financial resource, knowledge, and skills to use ICT service. The majority in this group are females, older generations, residence of rural areas, and uneducated people. Since technology access and social access are environmental factors, external agents especially the governments play important role in equipping the citizens with these accesses. As a matter of fact, governments are the facilitating agency who plays an intervention and leadership role in the diffusion of innovation (Frieden, 2005; Goh 1995; Shin & Kweon, 2011). In Singapore for example, it is well documented that the local government is a major driving force in the diffusion of ICT (Tan and Teo, 2000). The same goes with South Korea (Frieden, 2005; Shin & Kweon, 2011). Therefore, following these literature, we propose that government policy support has positive relationship with social and technology access. The more positive the citizens' perception toward the government's ICT policy support, the higher the level of accessibility they will see toward technology and social factors.

***H4: Perceived policy support will positively influence social access.***

***H5: Perceived policy support will positively influence technology access.***

Figure 1 depicts the research model.

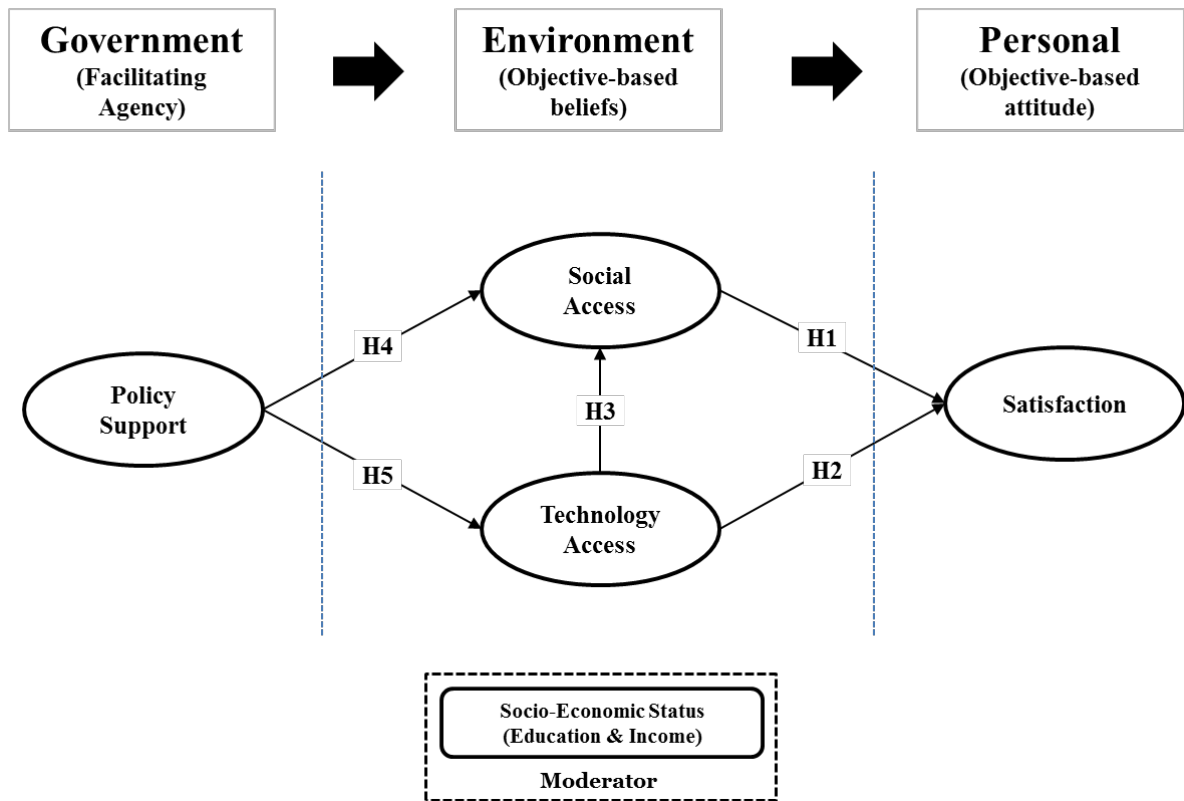


Figure 1. Research model

## Method

### *Verifying the Presence of Digital Divide in Korea*

To verify that digital divide exists in South Korea, we conducted a test on the data provided by the Korea Information Society Development Institute for a media panel study in 2012. We divided the sample (n=8382) into two groups: SEA and SED, using income and education as the separators. The ANOVA analysis shows a significant difference between the SEA and SED with regards to their use of the Internet, mobile phones, social network services, and cloud computing services (Table 1). This indicates that in the Korean society, digital divide exists to separate the SEA and SED.

**Table 1.** Descriptive statistics and ANOVA results of SED and SEA groups

ICT device and service usage		Sample Size	mean	Standard Deviation	Standard Error	F	p-value
Using mobile phones	SED	4907	1.15	.357	.005	504.541	<b>.000*</b>
	SEA	3475	1.01	.100	.002		
	Total	8382	1.09	.289	.003		
Internet search	SED	4907	1.55	.497	.007	1190.413	<b>.000*</b>
	SEA	3475	1.20	.400	.007		
	Total	8382	1.41	.491	.005		
Reading emails	SED	4907	1.59	.493	.007	1143.717	<b>.000*</b>
	SEA	3475	1.24	.425	.007		
	Total	8382	1.44	.497	.005		
Sending emails	SED	4907	1.61	.489	.007	1140.863	<b>.000*</b>
	SEA	3475	1.26	.437	.007		
	Total	8382	1.46	.499	.005		
Having email account	SED	4907	1.64	.479	.007	926.319	<b>.000*</b>
	SEA	3475	1.32	.468	.008		
	Total	8382	1.51	.500	.005		
Using Internet blog	SED	4907	1.96	.200	.003	45.900	<b>.000*</b>
	SEA	3475	1.92	.265	.004		
	Total	8382	1.94	.230	.003		
Using social network services	SED	4907	1.87	.337	.005	213.599	<b>.000*</b>
	SEA	3475	1.75	.435	.007		
	Total	8382	1.82	.385	.004		
Using cloud computing	SED	4907	1.98	.149	.002	51.944	<b>.000*</b>
	SEA	3475	1.95	.222	.004		
	Total	8382	1.97	.184	.002		
Being part of the Internet communities	SED	4907	1.85	.355	.005	206.654	<b>.000*</b>
	SEA	3475	1.73	.446	.008		
	Total	8382	1.80	.400	.004		

### ***Measurement Items & Data Collection***

With the presence of digital divide established, we conducted another study to investigate how the SEA and SED differ in terms of their perception toward government's ICT policy support, and how this perception influences their perceived technology and social access which in turns affect their overall satisfaction toward Internet use. The measurement items were adopted from previous studies and modified to fit our research context. Measurement items for technology and social access were adopted from Chang et al. (2012; 2014). Items for government policy support came from Tan & Teo (2000) and Hsieh et al. (2008). Satisfaction items were adopted from Bhattacharjee (2001). All the items were measured using 7-point Likert scales that range from "1: Strongly Disagree" to "7: Strongly Agree".

The survey questionnaire which was originally developed in English was translated into the Korean language. A pilot test was conducted to confirm the reliability and validity of the measurement model. After it was confirmed, an online survey of general Internet users in South Korea was conducted with the assistance of a professional online panel company. Partial least squares (PLS) structural equation modeling technique was used to analyze the research model.

### ***Demographic Information***

The respondents' demographic characteristics are shown in Table 2. We separated the SEA and SED using k-mean clustering analysis. The SEA consisted of 57.1% males and 42.9% females while the SED had 45.5% males and 54.5 % females. The majority of the SEA were undergraduate and graduate students (83.3% out of 100%) and the majority of the SED only obtained high school education or lower (71.5% out of 100%). As for monthly income, SEA respondents all had over 2,960,000 won (equivalent to USD2871) and SED respondents earned lower than 2,959,999 (93.7%). Previous digital divide research (Verdegem and Verhoest, 2009) found that females, low education, and low income people always fall into the SED category.

**Table 2.** Demographic characteristics of the SEA and SED groups

Characteristics		SEA: n=233 (%)	SED: n=319 (%)
Gender	male	57.1	45.5
	female	42.9	54.5
Age	20-29	8.6	34.5
	30-39	18.5	26.0
	40-49	34.3	21.6
	50-59	38.6	17.9
Education	Elementary school	0	1.0
	Middle school	0.9	10.2
	High School	15.9	60.3
	Undergraduate	68.3	25.1
	Graduate	15.0	3.4
Income (monthly) Korean Won	Less than 859,999	0	24.1
	860,000 – 1,789,999	0	25.4
	1,790,000 – 2,429,999	0	22.3
	2,430,000 – 2,959,999	0	21.9
	2,960,000 – 3,449,999	13.7	6.3
	3,450,000 – 3,959,999	14.2	0
	3,960,000 – 4,549,999	16.3	0
	4,550,000 – 5,239,999	21.0	0
	5,240,000 – 6,369,999	16.3	0
	More than 6,370,000	18.5	0

## Results

### *Measurement Model*

We first checked the reliability, convergent validity, and discriminant validity of the measurement model. The composite reliability of the constructs were all greater than the suggested cut off value of 0.7 in both the SEA and SED groups (Hair et al, 2009) (Table 3). All the item loadings also exceeded the minimum requirement of 0.7 (Table 5) (Barclay et al. 1995). All values for average variance extracted exceeded the recommended cut off value of 0.5 (Hair et al., 2009) (Table 3) and the square root of all AVEs were also greater than the correlations between any other two constructs in the same row and column (Chin, 1998) (Table 4). Therefore, our measurement model demonstrated good reliability, convergent validity, and discriminant validity.



**Table 3.** Construct reliability and convergent validity

Construct	AVE		Composite Reliability		Mean (S.D.)	
	SEA	SED	SEA	SED	SEA	SED
<b>Policy support (PS)</b>	0.81	0.82	0.96	0.96	4.61(1.07)	4.34(1.18)
<b>Social access (SA)</b>	0.77	0.80	0.93	0.94	5.17(0.89)	5.17(1.01)
<b>Satisfaction (SAT)</b>	0.78	0.78	0.94	0.93	5.43(0.80)	5.37(0.88)
<b>Technology Access (TA)</b>	0.76	0.73	0.93	0.92	5.61(0.85)	5.57(0.90)

Note: S.D.: Standard Deviation, AVE: Average Variance Extracted

**Table 4.** Correlation matrix and average variance extracted

Construct	PS	SA	SAT	TA
	SEA			
<b>Policy support (PS)</b>	<b>0.90</b>			
<b>Social access (SA)</b>	0.25	<b>0.88</b>		
<b>Satisfaction (SAT)</b>	0.20	0.63	<b>0.89</b>	
<b>Technology Access (TA)</b>	0.24	0.62	0.67	<b>0.87</b>
-	SED			
<b>Policy support (PS)</b>	<b>0.90</b>			
<b>Social access (SA)</b>	0.33	<b>0.89</b>		
<b>Satisfaction (SAT)</b>	0.23	0.68	<b>0.88</b>	
<b>Technology Access (TA)</b>	0.24	0.61	0.69	<b>0.86</b>

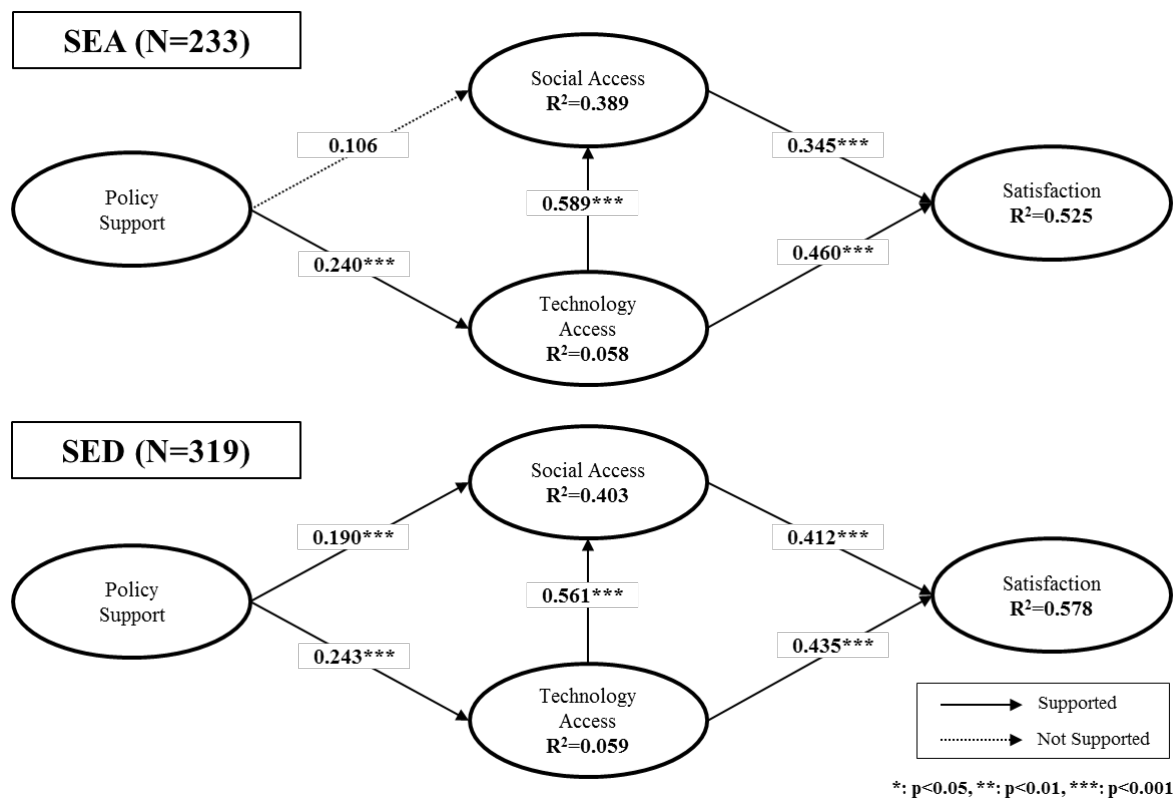
Note: Diagonals represent the square root of the AVE while off diagonals represent the correlations.

**Table 5.** Loadings and cross-loadings

Item	PS		SA		SAT		TA	
	SEA	SED	SEA	SED	SEA	SED	SEA	SED
<b>PS1</b>	<b>0.88</b>	<b>0.90</b>	0.27	0.31	0.20	0.23	0.22	0.25
<b>PS2</b>	<b>0.92</b>	<b>0.92</b>	0.19	0.33	0.15	0.25	0.18	0.25
<b>PS3</b>	<b>0.90</b>	<b>0.91</b>	0.15	0.25	0.15	0.18	0.17	0.15
<b>PS4</b>	<b>0.91</b>	<b>0.91</b>	0.22	0.24	0.19	0.17	0.23	0.20
<b>PS5</b>	<b>0.90</b>	<b>0.88</b>	0.25	0.31	0.20	0.21	0.25	0.22
<b>SA1</b>	0.23	0.30	<b>0.85</b>	<b>0.87</b>	0.53	0.60	0.52	0.54
<b>SA2</b>	0.19	0.23	<b>0.88</b>	<b>0.91</b>	0.58	0.65	0.52	0.56
<b>SA3</b>	0.22	0.30	<b>0.89</b>	<b>0.90</b>	0.52	0.58	0.51	0.49
<b>SA4</b>	0.23	0.33	<b>0.88</b>	<b>0.89</b>	0.56	0.59	0.60	0.58
<b>SAT1</b>	0.14	0.09	0.55	0.52	<b>0.90</b>	<b>0.85</b>	0.64	0.60
<b>SAT2</b>	0.15	0.22	0.54	0.62	<b>0.86</b>	<b>0.86</b>	0.51	0.54
<b>SAT4</b>	0.24	0.24	0.52	0.63	<b>0.87</b>	<b>0.90</b>	0.61	0.65
<b>SAT5</b>	0.18	0.27	0.61	0.62	<b>0.92</b>	<b>0.92</b>	0.61	0.62
<b>TA1</b>	0.23	0.26	0.54	0.60	0.62	0.66	<b>0.87</b>	<b>0.89</b>
<b>TA2</b>	0.24	0.16	0.51	0.46	0.60	0.59	<b>0.89</b>	<b>0.88</b>
<b>TA3</b>	0.19	0.20	0.54	0.51	0.52	0.54	<b>0.85</b>	<b>0.81</b>
<b>TA4</b>	0.17	0.19	0.55	0.51	0.60	0.55	<b>0.87</b>	<b>0.84</b>

### Structural Model

With the psychometric properties of the measurement model being established, we examined the structural model. Figure 2 shows the path analysis results of both the SEA and SED. For the SEA, the model explained 52.5% of the variance in satisfaction, 38.9% of the variance in social access, and 5.8% of the variance in technology access. For the SED, the model explained 57.8% of the variance in satisfaction, 40.3% of the variance in social access, and 5.9% of the variance in technology access. All hypotheses were supported for the SED, whereas for the SEA, H1 was rejected.



**Figure 2.** Results of the path analysis

### Discussion

This study examined the role of government policy support in affecting perceived technology access and social access which in turn influencing satisfaction toward Internet use. Specifically, it investigated how the SEA and SED differ in their perception. The results show that the SED sees government policy support as important to their technology and social access. The SED in general resides at the bottom of the pyramid. They would need government support and facilitation to provide basic ICT infrastructure. They especially need government intervention to control the pricing of online contents. Since the majority of the SED are also from the silver generation (Hsieh et al. 2008), they require government support to develop contents that will suit their readership.

The SEA, however, does not perceive the importance of governmental role in social access. One explanation is that this group has better educational backgrounds and economic status which enables them to purchase and subscribe to any online content they want to consume. In another words, they can afford the fees charged by service providers. As such, they tend to see this affordability as their own capability rather than having any link to government support. Furthermore, since they are educated, they have the capability to consume a wider range of contents compared to the SED. While this is the case with social access, the SEA does not have the same view when it comes to government support of technology access. One reason is probably technology access in terms of the overall infrastructure requires general government effort in strategizing, planning, and organizing proper installment of facilities such as fiber optic lines. Even if an individual has money, his/her would not be able to pull fiber optic lines should such facility is not available.

The study has important implications for governments. It underscores the need to address the issues of digital divide so that the society as a whole can benefit from ICT development and advancement. This study confirms the role of governmental policy support in affecting citizens' technology and social access as well as their satisfaction toward Internet use. The results imply that a one-size-fit-all policy will not be effective. Instead, governments need to tailor different intervention programs based on the socio-economic status of the citizens. For the SED, governments need to exert tighter control toward the pricing of ICT hardware, software, and online contents. This will ensure that this group can enjoy the benefits of ICT advancement just as their advantaged peers.

### **Limitations and Future Research**

This study has some limitations. First, it only focused on socio-economic status of the participants without taking into consideration the areas where the respondents live. It is possible that geographical location plays a role in the citizens' perception. For example, those who reside in the rural areas may require more government support in providing good technology access compare to those who live in urban areas where ICT infrastructures are readily available. Therefore, future research could examine the differential impact of geographical locations on citizens' satisfaction level. Other demographic factors such as gender and age group can also be taken into consideration. In countries where multiple ethnicities are present, study could incorporate ethnicity differences in their investigation.

Second, this study only examined positive government effort in supporting ICT initiatives. The study did not investigate activities that may be perceived negatively by the citizens such as censorship and piracy crackdown that might influence user satisfaction. Future research could examine the impact of these negative perceptions.

Future research could also compare government policy and effort in different countries and see how these differences affect the citizens' satisfaction. Even in cases where similar effort and policy are being implemented, future research could see how countries being at different level of development (i.e., developed versus developing countries) react to the same policy.

## References

- Aerschot, L. V., & Rodousakis, N. (2008). The link between socio-economic background and Internet use: barriers faced by low socio-economic status groups and possible solutions. *Innovation: the European journal of social science research*, 21(4), 317-351.
- Barclay, D., Higgins, C., & Thompson, R. (1995). The partial least squares (PLS) approach to causal modeling: Personal computer adoption and use as an illustration. *Technology Studies*, 2(2), 285–309.
- Bhattacharjee, A. (2001). Understanding information systems continuance: an expectation-confirmation model. *MIS quarterly*, 25(3), 351-370.
- Chang, Y., Shahzeidi, M., Kim, H., & Park, M. C. (2012). Gender digital divide and online participation: A cross-national analysis, *19th ITS Biennial Conference 2012*, Bangkok, Thailand, 18 - 21 November 2012. <http://www.econstor.eu/handle/10419/72506>.
- Chang, Y., Wong, S.F., Park, M.C. (2014). 3-Tier ICT Access Model for Online Participation: A Cross-National Comparison. *Information Development*, Published online before print April 10, 2014, doi: 10.1177/0266666914529294.
- Chen, W. and Wellman, B., (2003), “Charting and Bridging Digital Divides,” i-Way, *Digest of Electronic Commerce Policy and Regulation*, 26, 155-161.
- Chin, W.W. (1998). The partial least squares approach for structural equation modeling. In G. A. Marcoulides (Ed.), *Modern Methods for Business Research* (pp. 295–336). Mahwah, NJ: Lawrence Erlbaum Associates.
- DeLone, W.H. and McLean, E.R. (1992). Information systems success: the quest for the dependent variable. *Information Systems Research*, 3(1), 60-95.
- Frieden, R. (2005). Lessons from broadband development in Canada, Japan, Korea and the United States. *Telecommunications Policy*, 29(8), 595-613.
- Goh, H. P. (1995). *The diffusion of Internet in Singapore: a content analytic approach*. Faculty of Business Administration, National University of Singapore, 96.
- Hai, J.F, Black, W.C., Babin, B.J., and Anderson, R.E. (2009). *Multivariate Data Analysis*. New Jersey: Upper Saddle River, Pearson Prentice Hall.
- Hoffman, D. L., Novak, T. P., & Schlosser, A. (2000). The evolution of the digital divide: How gaps in Internet access may impact electronic commerce. *Journal of Computer-Mediated Communication*, 5(3), 0-0.
- Hsieh, J. J., Rai, A., & Keil, M. (2008). Understanding digital inequality: Comparing continued use behavioral models of the socio-economically advantaged and disadvantaged. *MIS quarterly*, 32(1), 97-126.
- ITU (International Telecommunications Union) (2013) *Measuring the Information Society*. Retrieved from < [http://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2013/MIS2013\\_without\\_Annex\\_4.pdf](http://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2013/MIS2013_without_Annex_4.pdf)>. Access November, 30, 2013.
- Marson, S. M. (1997). A selective history of Internet technology and social work. *Computers in Human Services*, 14(2), 35-49.
- MSIP (2013), *2013 Science and Technology Statistics*, White Paper, [http://www.msip.go.kr/www/brd/m\\_220/view.do?seq=425&srchFr=&srchTo=&srchWord=&](http://www.msip.go.kr/www/brd/m_220/view.do?seq=425&srchFr=&srchTo=&srchWord=&)

srchTp=&multi\_itm\_seq=0&itm\_seq\_1=0&itm\_seq\_2=0&company\_cd=&company\_nm=&page=1.

OECD, (2001), *Understanding the digital divide*. Paris, France: OECD Publications.

Shin, D. H., & Kweon, S. H. (2011). Evaluation of Korean information infrastructure policy 2000–2010: Focusing on broadband ecosystem change. *Government Information Quarterly*, 28(3), 374-387.

Pick, J. B., & Azari, R. (2008). Global digital divide: Influence of socioeconomic, governmental, and accessibility factors on information technology. *Information Technology for Development*, 14(2), 91-115.

Tan, M., & Teo, T. S. (2000). Factors influencing the adoption of Internet banking. *Journal of the AIS*, 1(1es), 1-42.

Van Dijk, J.A. (2006). Digital divide research, achievements and shortcomings. *Poetics*, 34(4): 221-235.

Van Dijk, J., & Hacker, K. (2003). The digital divide as a complex and dynamic phenomenon. *The information society*, 19(4), 315-326.

Verdegem, P., & Verhoest, P. (2009). Profiling the non-user: Rethinking policy initiatives stimulating ICT acceptance. *Telecommunications Policy*, 33(10), 642-652.

Wixom, B.H. and Todd, P.A. (2005) A theoretical integration of user satisfaction and technology acceptance. *Information Systems Research*, 16(1), 85-102.