

Who Are Political Users of the Internet?: An Empirical Study of the Democratic Divide

Taewoo Nam
University at Albany, SUNY
187 Wolf Rd, Ste 301, Albany, NY12205
+1-518-442-3924

namtaewoo@gmail.com

ABSTRACT

This paper, analyzing the Pew Internet & American Life Project's 2008 postelection survey, examines whether the demographic pattern of a digital divide differentiates significantly between general users and political users of the Internet. Internet users in this study includes six types: general Internet users, daily users, users for light political purposes, users for campaign engagement, general users of social networking sites, and social networking sites users for political connection. Testing the cross-group difference, the study found out that age, education and income make a demographic divide in general Internet usages. The divide pattern for light political activities is different from that for more politically engaged, concerned activities. Reflecting the Internet is not yet a predominant medium for politics, the probability of Internet use for campaign engagement and of social networking sites use for political purposes is not high. The digital divide in political usages of the Internet (the democratic divide) resembles the pattern in general usages.

Categories and Subject Descriptors

G.3 [Probability and Statistics]: Regression analysis
J.4 [Social and Behavioral Sciences]: Sociology

General Terms

Measurement, Theory

Keywords

Digital divide, Democratic divide, Participation divide, Usage divide, Social networking site

1. INTRODUCTION

The existence of a digital divide has dampened our optimistic expectation that the Internet contributes to remedying such democracy-impeding effects as participatory inequality and political apathy. In this sense, the digital divide has been Achilles' heel to cyber-utopian arguments as well as a powerful weapon wielded by cyber skeptics. It confines democratic potentials of information communications technologies (ICTs) to Internet users or "netizens," impeding extension to all citizens. The Internet unleashes not just a dream of Internet-driven democratization but also a nightmare of social unevenness in universal accessibility to Web-based technologies and infrastructures [6,13,36,38,48,51,58].

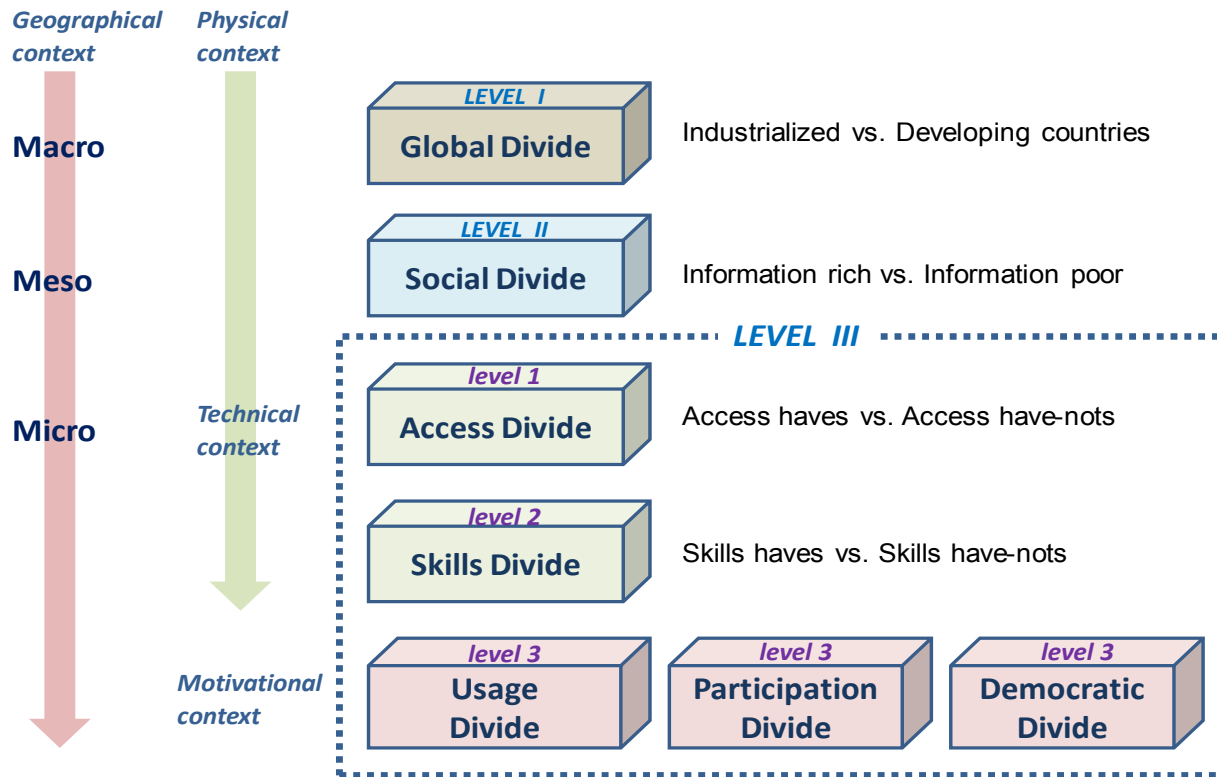
The Janus-faced ambivalence of the Internet is pervasive across all societies, but the realities of the digital divide vary with contexts of Internet usage. The category of being a netizen in ICT-leading countries keeps reaching closer to the whole citizenry, thereby reflecting expansion of physical access to the Internet. The number of Internet users substantially increases so that the divide in access is saliently bridged [52]. The digital divide, however, still remains wide or even gets more serious in terms of its various, multifaceted definitions other than a simplistic gap in whether an individual has access to the Web. Though a divide in access and skills has been gradually mitigated with spread of technological benefits, advanced countries report a growing divide in political participation on the Internet [21,24,41].

This paper postulates the demographic pattern of a digital divide may vary with the type of Internet usages. It focuses on a demographic divide in general use and political use of the Internet. Analyzing the Pew Internet & American Life Project's 2008 postelection national survey, the study empirically examines whether the demographic pattern of a digital divide differentiates significantly between general users and political users. The statistical analysis employs two main methodologies: Chi-square test to signify the cross-group difference, and binary logistic regression to find out significant demographic predictors for the propensity to be a particular type of using the Internet. The paper starts with reviewing multiple concepts of a digital divide beyond an access divide, and then describes details of the dataset employed and measurements. Results and implications of the statistical analysis are summarized and discussed in later parts.

2. USAGE DIVIDE: FROM THE ACCESS DIVIDE TO THE DEMOCRATIC DIVIDE

The simple, common concept of a digital divide defined as "the distinction between the information haves and have-nots [1,42]" entails multi-dimensional interpretation of a gap in ICTs adoption and use. The concept commonly implies the presence of inequality in the digitized world, but its multiple meanings represent variously differential types of digital equality. The question of "equality of what?" makes us think about manifold consequences of the digital divide. Exploring a sheer number of previous studies that discussed inequality in cyberspace by the digital divide, van Dijk [59] presented five categories of inequality: 1) technological inequality in technical opportunities such as physical access to the Internet and infrastructure; 2) immaterial inequality in freedom and life chances; 3) material inequality in socioeconomic capital and resources; 4) social

Figure 1. Multi-level digital divide



inequality in positions, power and participation; and 5) educational inequality in capabilities and skills.

A rich body of existing research theoretically and empirically constructed multi-stages of a digital divide that generates negative consequences from inequality. Three academics' works – Eszter Hargittai [19,20,21,22], Pippa Norris [40,41] and Jan A.G.M. van Dijk [59,60] – that observed conceptual variability of a digital divide are phenomenal. Despite differences in categorization, the three scholars commonly posit multilevel evolution of the digital divide concept by social and technological development.

Van Dijk's [59] framework depicted sequential stages of a digital divide: 1) material access; 2) motivational access; 3) skills access; and 4) usage access. Contrary to abundance in studies on a divide in physical access and skills access, a relatively small number of works have paid attention to a usage access. Going beyond a physical access and skills divide, the usage divide is pertinent to time or frequency, purpose or intention, and activeness in using the Internet.

Along with van Dijk's [59,60] categorization, other taxonomies of a digital divide also identify its earlier stage as an access and skills divide [1,54]. The equality in opportunities to have easy access to cyberspace and to acquire relevant skills is a fundamental condition necessary for digital democracy. Hargittai [19] named an access divide and a skills divide as the first- and second-level divide, respectively. Lion's share of related studies found salient disparities in Web access along the lines of age, race, gender, education and income [34,37]. Skills of Internet users also follow the same social cleavages as discernible patterns in an

access divide. Traditionally disadvantaged demographic groups are lagged behind in Internet skills and access [26].

In the meantime, Norris [41] established a multidimensional concept different to Hargittai's [19,20,21] access and skills divide. Her three dimensions sketch types of a digital divide in terms of a spatial context and the concept of equality. Geographical categorization contrasts between a global divide and a social divide. While the former refers to a cross-national gap between industrialized and developing countries, the latter means a gap between the information rich and poor in an individual country [15,17,18,30,31,62]. Internet use is not an ethereal, boundary-less activity, but rather is situated in a spatial or geographic context [3]. Distinctly from these two concepts based on a geographical context, Norris' third dimension sheds light on a divide in participatory equality – a democratic divide defined as “the divergence between people who do and do not use digital resources to engage, mobilize and participate in public life.” The study of Hargittai and Walejko [24] highlighted a participation divide in the digital age, which corresponds to Norris' [41] democratic divide. Figure 1 epitomizes the hitherto literature review of the multi-level digital divide.

The interpenetrated effect of a digital divide and online participation has brought social, political implications of the Internet to academics [5,10,11,25,32,53,61]. Demographic disparities in Internet access and technological skills lead to unequal distribution of technology resources, amplification of voices by the affluent and well-educated, and further marginalization of the underprivileged [8,9,35,47]. Opportunities for political participation online primarily benefit elites with ICT

resources and motivation to take advantage of the resources so that the poor and less-educated are left farther behind [57].

Owing to the fact that the digital divide in a lower level is gradually being narrowed, societal attention in ICT-advanced countries moves from the steady improvement in access and skills toward the equalization in Internet usages. A democratic divide or a participation divide appears as one facet of the usage divide. The divide beyond an access and skills divide is sharp in political use of the Internet. In other words, the usage pattern by political users of the Internet shows a democratic divide or a participatory divide [10]. The conventional wisdom rooted in cyber-optimism is that if Internet access were to expand, the Internet would indeed mobilize participation by many previously inactive citizens. Though such idea is true, the pattern of a democratic divide in political Internet use can be different from the steadily equalized pattern in an access divide. Multi-dimensions of a digital divide would reveal the existence of different patterns across its various contexts.

Focusing on the usage divide in American netizens' online activities, this study compares the divide pattern between two categories of Internet users (general users and political users). General users fall into daily (frequent) users and non-daily users. Another focus goes to users of social networking sites; general Internet users are grouped into users vs. non-users of social networking sites. Finally, the pattern of a democratic divide in political use of social networking sites is analyzed. The study examines whether disparate types of Internet users show differential patterns of the usage divide. Figure 2 juxtaposes a research focus of this paper into discussions of the multilevel digital divide.

3. DATA, MEASUREMENT AND METHOD

3.1 Dataset

This study analyzes the secondary data from the national survey that the Pew Internet & American Life Project conducted by telephone interviews after the 2008 presidential election. The random sampled dataset includes variables germane to multiple types of Internet users. Table 1 shows the size and demographic distribution of the sample vary with the type of Internet users. The whole sample comprising both Internet users and non-users has more even distribution in the level of education and income than the sample of Internet users. The proportion of better-educated wealthy groups is high in all types. Among Internet users, a notable difference comes out between users and non-users of a social networking site (SNS), which is one of representative configurations and manifestations of social potentials of interactive Web 2.0 technologies characterized as bi- and multi-directional connections. The sample of SNS users is disproportionately distributed, thereby revealing a generational gap in using SNS (e.g., Facebook, MySpace, Twitter, and so on). Especially and expectedly, the younger generations (specifically, Y generation) outnumber overwhelmingly the older ones in the SNS sample.

Figure 2. Research focus

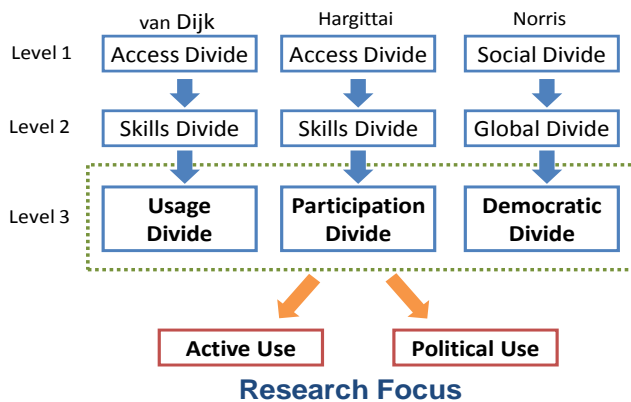


Table 1. The demographic distribution of the sample

Categories or groups	Sample					
	Whole sample	Internet users	Political active users	SNS users	SNS political users	
Age	Y-generation (18-31)	12%	16%	18%	40%	51%
	X-generation (32-43)	16%	20%	21%	28%	28%
	Young boomers (44-53)	20%	24%	25%	17%	13%
	Old boomers (54-62)	18%	10%	18%	11%	6%
	Matures (63-71)	14%	11%	11%	3%	2%
After work (72+)	19%	10%	7%	1%	0%	
Gender	Female	53%	51%	50%	54%	56%
	Male	47%	49%	50%	46%	44%
Race	Non-white	17%	16%	15%	20%	23%
	White	83%	84%	85%	80%	77%
Education	High school incomplete (11th grade or lower)	9%	3%	2%	3%	3%
	High school graduate (12th grade)	33%	27%	21%	24%	22%
	Some college (13th ~15th grade)	24%	27%	28%	31%	35%
	College degree (16th grade or higher)	34%	43%	49%	41%	40%
Income	\$30,000 or less	30%	18%	14%	20%	20%
	\$30,001 ~ \$50,000	21%	22%	20%	23%	24%
	\$50,001 ~ \$75,000	18%	22%	22%	17%	16%
	\$75,001 or more	31%	38%	44%	40%	40%
Total number of observations	2,252	1,589	1,176	439	212	

Source: <http://www.pewinternet.org/Shared-Content/Data-Sets/2008/November-2008--Post-Election.aspx>

While gender is almost equally sampled, race is oversampled for whites with consideration of their actual proportion (approximately three quarters) in the American population. Except the SNS sample, age is normally distributed around its mean (44) so that the number of young boomer cohorts is largest. The division and nomenclature of generations follow the categorization in the original dataset. Young boomers, Old boomers, Matures, and After-work generation is also called as Trailing boomers, Leading boomers, Silent generation, and GI generation, respectively.

3.2 Methodology

The study analyzes a usage divide in the 2008 election season by two methodologies. Chi-square test is to find out whether the five demographic characteristics make distinctions in the digital divide pattern by different types of Internet users. As a statistic for significance of cross-tabulation, a Chi-square score is to prove significance of the cross-group difference in the probability of binary dependent variables. The probability disparities among demographic groups are pictured in a plot. In addition, the visual illustration presents how the pattern of the usage divide differs between general usage and political usage of the Internet. The second part of the statistical analysis is conducted by binary logistic regressions. The regression method allows us to know what demographics are strong predictors for the propensity to be a specific user of the Internet.

3.3 Variables

To examine the existence of a usage divide, this study sets demographics as explanatory variables, and categorical variables to represent the type of Internet users as dependent variables. Considering the conventional definition of a digital divide as disparities and inequalities in computer ownership and Internet access based on such demographics as age, gender, race, education and income [7,39], the demographic and socioeconomic characteristics are expected to act as crucial determinants or predictors for distinguishing between the patterns of political use and general use of the Internet.

Better-educated wealthy whites would be more likely to have access to the Internet, technological competences, information literacy and political activism online than their counterparts [29,37]. Age has been included as a main predictor for a democratic divide in prior literature [2,51] to test two mutual counter-arguments : 1) general activeness of younger generations on the Internet would appear in political involvement online; and 2) the level of civic engagement would generally get higher with aging. Younger generations' domination on social networking sites may not appear in politically purposive use of the Internet [44]. On the other hand, though gender has drawn relatively little attention in literature of the technical divide [23], several studies about online political participation proved the presence of a gender gap in political activities on the Internet [45,50,56].

As such, demographic characteristics are adopted as

explanatory variables. To examine the pattern of a divide, demographics are grouped into several categories. Grounded on Howe and Strauss' [27,28] pioneering work in generation division and on Jones and Fox' [33] separation of the baby boomer into old and young cohort, age is categorized as six generations: Y generation (age 18-31), X generation (32-43), Young boomers (44-53), Old boomers (54-62), Silent generation or Matures (63-71), and GI generation or After-work (older than 71). While the age categorization of six cohorts is used for cross-group comparison, regression analysis employs age in years for better linear estimation. Education is grouped into four levels: high school incompletes (lower than 12th grade), high school graduates (12th grade), some college level including current collegiate students (13th-15th grade), and four-year college graduates or higher (16th grade or higher). The level of household income also falls into four strata: \$30,000 or less, \$30,001-\$50,000, \$50,001-\$75,000, and more than \$75,000. For regression on income and education, the analysis adopts continuous variables – household income in \$10,000 and school attainment in years (grade) – instead of the four-scale ordinal variables. The simpler group categorization is still useful for cross tabulation (for Chi-square test) between demographics and dependent variables.

Dependent variables represent six different types of Internet users. All are binary variables that have a value of 1 if a respondent belongs to a particular category of users. The whole sample is bisected in terms of whether a respondent uses the Internet. The variable “Internet use” is coded as 1 when a respondent is an Internet user, or 0 for otherwise. The subsample of Internet users is grouped by three types of division. The variable “daily use” is dichotomous between people using the Internet everyday or at least several times a week (70% of all Internet users) and those using it less frequently (30% of them). The variable “SNS use” has a binary value in terms of whether to visit social networking sites. About a quarter of all Internet users go to social networking sites, regardless of the frequency.

The variable “political use” is valued as 1 for a respondent who gave consistently any positive answer (a response who did not select “never” or “no” in ordinal scale items) to all four questions related to political activities online. The questions are: 1) Did you ever go online to get news or information about the 2008 elections?; 2) Did you communicate with others about politics, the campaign or the 2008 elections using the Internet?; 3) How often did you receive email from a candidate or political party?; and 4) How often did you send or receive email to or from friends, family members or others about the campaign?

Of 1,176 political Internet users, 53% use actively the Internet to engage in presidential election campaigns. The binary variable “campaign-engaged political use” gives 1 to respondents who positively answered to at least one of nine questions: 1) Did you sign up online to receive updates about the campaign or the elections?; 2) Did you contribute money online to a candidate running for public office?; 3) Did you sign up online for any

Table 2. The distribution of Internet users

	Type of Internet users					
	Internet users	Daily users	Political users	Engaged political users	SNS users	SNS political users
Yes	1,589 (71%)	1,108 (70%)	1,176 (74%)	623 (53%)	439 (28%)	212 (48%)
No	663 (29%)	481 (30%)	413 (26%)	553 (47%)	1,150 (72%)	227 (52%)
Total	2,252	1,589	1,589	1,176	1,589	439

volunteer activities related to the campaign – like helping to register voters or get people to the polls?; 4) Did you share photos, videos or audio files online that relate to the campaign or the elections?; 5) Did you forward someone else’s political commentary or writing to others?; 6) Did you forward someone else’s political audio or video recordings to others?; 7) Did you set up alerts to get political or campaign information emailed to you when new information is cited in the news or on the Web?; 8) Did you customize a web page to display new political or campaign information that is especially interesting or important to you?; and 9) Did you subscribe to receive campaign or political information through an RSS feed?

The variable “SNS political use” is valued of 1 for a positive response to any of five yes/no questions: 1) Have you gotten any campaign or candidate information on the sites?; 2) Have you started or joined a political group, or group supporting a cause on a social networking site?; 3) Have you revealed on a social networking site which Presidential candidate you voted for this year?; 4) Have you discovered on the sites which Presidential candidate your friends voted for this year?; and 5) Have you signed up as a friend of any candidate on a social networking site? Half of 439 SNS users are categorized as political users of SNS.

4. PATTERNS OF THE INTERNET USAGE DIVIDE

This section examines whether the demographic pattern in a usage divide is differentiated between the probability to be a general Internet user and that to be a political Web user. Table 3 describes statistical significance of the cross-group difference with respect to each demographic characteristic, and Figure 3 visualizes the probability difference tested in Table 3. The steepness of a slope portrays a sharp divide in Internet usage.

The lines plummeting with aging expectedly demonstrate younger generations are highly likely to be dominant users of the Internet. Whereas the probability for respondents in their twenties and thirties to generally use the Internet is no less than 90%, a share of Internet users takes up around half of those in sixties. Both gender and race do not signify a difference between the probabilities to be a daily user and an infrequent user, but being white makes a significant distinction between the probabilities to be a user and a non-user of the Internet. Accordingly, Figure 3 presents the obvious existence of a general usage divide in terms of age, education and income. As expected, people with higher socioeconomic status (SES) measured by school attainment in years and annual household income are more likely to generally use the Internet than those with lower SES. A salient linear pattern in the usage divide across demographic groups leads to the inference that age, education and income would determine

linearly the probability of general use and daily use of the Internet with statistical significance.

On the other hand, political use of the Internet reveals both similarities with and differences from general usage. The probability for political use of the Internet is as quite high as that of daily Internet use; in the graphical illustration, the line of political usage is almost the same as that of daily general use. Little difference between two lines hints most of daily general users of the Internet tend to acquire political information and make casual (light) conversation about politics with others via the Web during the campaign season. The variable measured by online political information-seeking and online casual political communication in the preelection period offers a higher likelihood of younger, white, better-educated, affluent males to use the Internet with political purpose than their counterparts’ likelihood to do so. A conspicuous pattern of the political usage divide by educational level bolsters the existing argument that political knowledgeability, cognizability and intelligence developed by education encourage political participation.

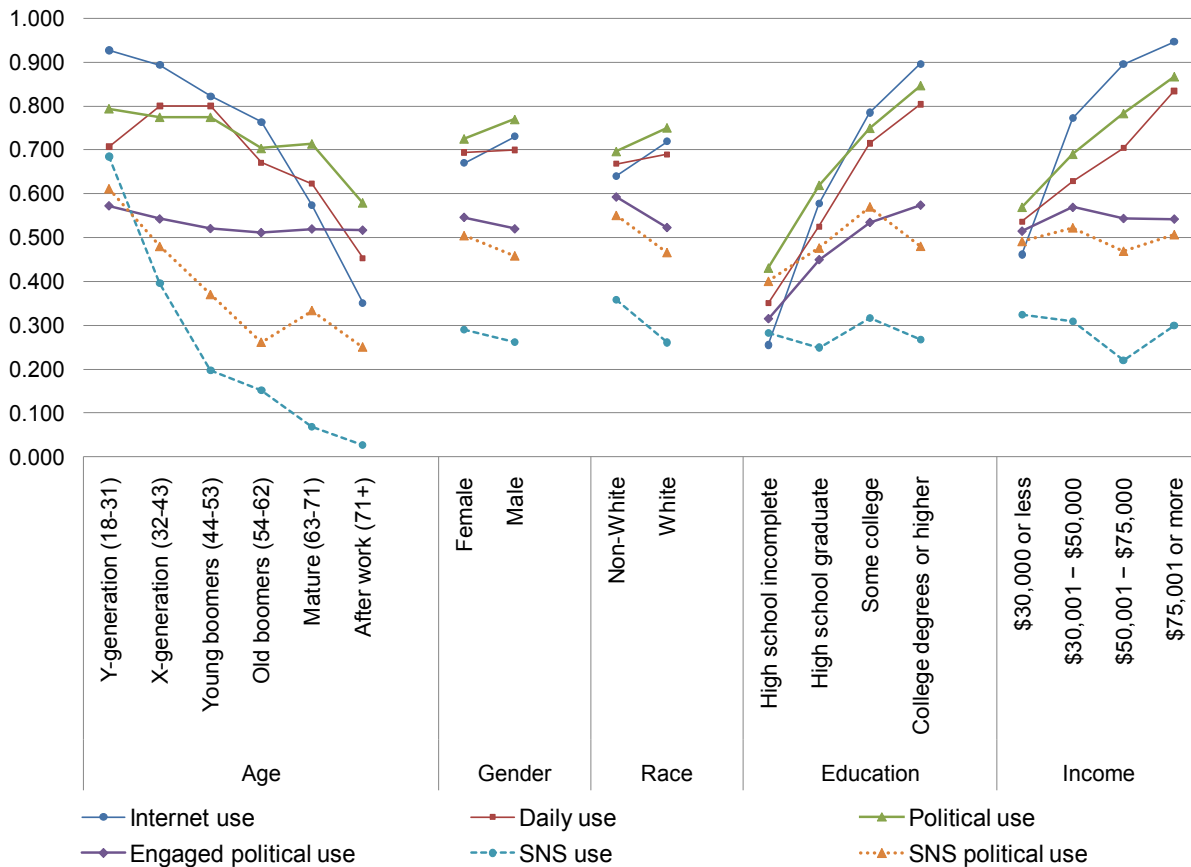
However, another type of political usage of the Internet – campaign-engaged use – fails to signify the divide widened by demographics other than education. In online political activities for involvement in election campaigns, the generic tendency that younger generations occupy virtual spaces does not show up. A mix of explanatory factors to predict individual involvement in and commitment to online politics account for an obvious disparity between casual political use and engaged political use of the Internet. Whereas there is no doubt that the Internet is a playground for young people, the digital generation is reported to lose civic virtues and attitudes to care about societies and communities [47]. It is mostly seniors who voluntarily commit to individual and public deliberation over politics and common issues. The two conflicting arguments of more active political involvement vs. less active Internet use with aging are offset by their reciprocally opposing linear impacts – opposite signs of monotonously increasing vs. decreasing lines of the participation level estimated with aging [47]. A seemingly quite flat curve across cohorts mirrors the consequence neutralized by opposite signs of monotonously ascending slope and descending slope linearly estimated with aging. Implying an equalized pattern in committed, engaged political Web usage, the flat line makes little difference across income strata. The horizontal lines of the probability for online campaign engagement in age and education consistently lie below the steep curves of the probability for online political activities with a lower level of political deliberation and involvement. People use the Internet for less serious (light) political activities such as information-seeking and casual communication with others more frequently than for the purpose of committed participation in politics.

Table 3. The cross-group difference in the probability

Demographics	Internet use	Daily use	Political use	Engaged political use	SNS use	SNS political use
Age	$\chi^2=447.39^*$	$\chi^2=68.95^*$	$\chi^2=32.14^*$	$\chi^2=2.14$	$\chi^2=359.32^*$	$\chi^2=26.33^*$
Gender	$\chi^2=6.10$	$\chi^2=0.04$	$\chi^2=1.79$	$\chi^2=0.83$	$\chi^2=1.63$	$\chi^2=0.93$
Race	$\chi^2=9.52^*$	$\chi^2=1.09$	$\chi^2=5.25^*$	$\chi^2=2.88$	$\chi^2=10.03^*$	$\chi^2=2.05$
Education	$\chi^2=389.06^*$	$\chi^2=107.43^*$	$\chi^2=124.63^*$	$\chi^2=17.50^*$	$\chi^2=5.40$	$\chi^2=3.58$
Income	$\chi^2=390.24^*$	$\chi^2=82.85^*$	$\chi^2=94.18^*$	$\chi^2=0.72$	$\chi^2=9.09^*$	$\chi^2=0.57$
Total probability	0.710	0.697	0.740	0.533	0.276	0.483

* $p < 0.05$

Figure 3. The probability to be different types of Internet users



Only the level of education is a significant marker to distinguish the difference in the probability for campaign-engaged use of the Internet among demographic groups. Not merely does education have a strong linear impact on the probability of political engagement online, but it also discloses a noticeable divide between high school incompletes and college graduates in that probability. The stratification by a level of education widens a digital divide in both light and concerned political usage as well as general use of the Internet.

The last type of the Internet users that this study focuses on is players on social networking sites. Age shows a noteworthy pattern in the probability to be a general user of social networking sites. More than two thirds of respondents in their twenties using the Internet are regular users of the websites. A monotonously sharp decline of the probability with aging echoes the dominance of younger generation on the sites. This expected finding is repeated in political usage of social networking sites. While 60% of Y generation going to social networking sites uses the sites for political activities during the presidential election season, less than a third of the older users politically utilize the sites. It is desirable for e-democracy that income and education do not signify the presence of the political usage divide. The fact that current college students or those with education in some collegiate level are generally more likely to do political activities on social networking sites than college graduates or those with higher grades over college graduation is intriguing. The leverage by the highest probability for college students in early twenties to enthusiastically enjoy leisure activities on social networking sites

overwhelms the linear effect estimated by a monotonous increase of the probability (to use politically the Internet) with the rise in an education level.

Whereas the continuous bridging of an access divide has been undoubtedly good news in leading countries of ICT development, the divide in political usage of the Internet is being marked as an evident social phenomenon showing a sharp demographic contrast between political users and non-users of the Internet. Political usage for casually light political activities online benefits the young, better-educated and affluent. Meanwhile, campaign-committed activities requiring political interests, involvement and deliberativeness significantly discriminate among different levels of education despite a moderate degree of participation equalized in aspect of other demographics. About half of social networking site users have experiences to go there for political activities in the campaign season. The sites are not yet effective campaign media for a whole constituency across various cohorts. The trend of young people’s activism on social networking sites contrasts with the cross-cohort equalized pattern in campaign-involved political usage. A low level of reliance on social networking sites for political usage implies individuals’ political activities for connecting candidates and campaign people still occur more frequently in offline, traditional ways or through other types of electronic modes (mostly by email) than in new “social” online venues enabled by Web 2.0 technologies.

Table 4. Binary logistic regressions on demographic characteristics

Demographics	Dependent variables					
	Internet use	Daily use	Political use	Campaign-engaged use	SNS use	SNS political use
Age	-0.064* [-0.007]	-0.022* [-0.004]	-0.019* [-0.003]	-0.009* [-0.002]	-0.083* [-0.014]	-0.046* [-0.011]
Male	0.287* [0.031]	0.129 [0.025]	0.054 [0.009]	0.002 [0.000]	-0.285 [-0.050]	-0.359 [-0.089]
White	0.756* [0.098]	0.027 [0.005]	0.234 [0.041]	-0.351 [-0.086]	-0.024 [-0.004]	-0.334 [-0.083]
Education	0.281* [0.030]	0.230* [0.045]	0.263* [0.044]	0.126* [0.031]	0.062 [0.011]	0.075 [0.019]
Income	0.269* [0.029]	0.102* [0.020]	0.100* [0.017]	-0.024 [-0.006]	0.006 [0.001]	0.030 [0.007]
Intercept	-0.780	-1.934*	-2.509*	-0.781	2.007*	0.813
N	2,252	1,589	1,589	1,176	1,589	439
Predicted prob	0.877	0.7359	0.7876	0.5432	0.2269	0.4926
G ²	676.90*	162.30*	156.19*	24.39*	312.66*	34.45*
Log likelihood	-630.80	-719.15	-660.06	-682.21	-638.59	-246.85
Pseudo R ²	0.349	0.101	0.106	0.018	0.197	0.065

* $p < 0.05$

Note 1. $G^2 = \chi^2$ statistic of a log likelihood ratio.

Note 2. The predicted probability is calculated at the mean of all other independent variables.

Note 3. [] is a marginal effect calculated by $\beta_i \cdot \{\text{predicted probability} \cdot (1 - \text{predicted probability})\}$.

5. PREDICTORS FOR INTERNET USAGE

While the previous section illustrated the pattern of the political usage divide by each demographic characteristic, this section, running binary logistic regressions, examines the simultaneous effect of all the five demographics on the probability for a particular usage of the Internet. Table 4 presents the results of estimating the probability for six different types of Internet usage by demographic variables.

Age consistently serves as a significant predictor to estimate all dependent variables. The magnitude of a slope is alternatively compared by the marginal effect. The estimated marginal effect of age in years shows that the probability to be an Internet user and a daily Web user drops by respectively 7% and 4%, given an increase in age by ten years. Since this marginal effect is estimated around the likelihood of an average respondent (holding all other independent variables at their mean), the effect would be distorted if we estimate the probability of an individual placed on extreme tails of normally distributed demographic characteristics. The marginal effect implying a linear impact is meaningful around average in each demographic characteristic, not at its extreme or outlying values.

The impact of age on the propensity of Internet usages is significantly negative, meaning that as people gets older, their likelihood to use the Internet decreases with aging. A ten-year increase in age decreases by 3% the probability that Internet users go to the Web for political activities, and also drops by 2% the probability that they use the Internet for campaign engagement. The impact of age on the probability to be a user of social networking sites is larger; additional ten years in age decline by 14% the probability that a general Internet user goes to social networking sites for any activity. The same change in age also drops by 11% the probability that a user of social networking sites utilizes the sites for political purpose.

Both gender and race are mostly not qualified to be a strong predictor for the propensity of various usages of the Internet though the dummy variables significantly predict the average difference in the probability of being a general Internet user between males and females, and between whites and non-whites. The regression estimates a racial gap in the probability to use the Internet is three times as large as a gender gap because the effect

of being male and white is 3.1% and 9.8%, respectively. Estimation for dependent variables other than Internet use is not signified by gender and race.

Significance of coefficients on explanatory variables shows no discrepancy from results of the cross-group probability difference test in Table 3. Education and income are a strong predictor for the probability of Internet use, daily use and political use. The linear impact (marginal effect) of education is larger in daily use and political use than in general use. The one-year increase in school attainment raises by 4.4% the probability to use the Internet for political information-seeking and casual political communication. The one additional grade also raises by 3.1% the probability that Internet users are engaged in election campaigns by online political activities. In the meantime, the increase by \$10,000 in household income lifts the probability of Internet use, daily use, and political use by 2.9%, 2%, and 1.7%, respectively.

6. DISCUSSIONS

This study confirmed the impact of age, education and income on both general usage and political use of the Internet. Political usage reveals two different patterns in the usage divide by age. In online political activities to acquire political information and talk politics on the Internet to others, young people are more likely to do so using online media. By contrast, such divide disappears in more deliberative online activities requiring engagement and involvement in election campaigns. Accordingly, the probability of online political activities distinguishes thin activities from thick activities [4,46,47]. The casualness of light political activities raises the probability of political usage by young people who regularly go to the Internet. The high likelihood of young generations' political apathy and old generations' political commitment is offset against another high likelihood of the former's enthusiastic domination on virtual spaces and the latter's lack of technical skills and competences to use the Internet. Hence, a notable finding here is that the pattern in the political usage divide depends on the level of political commitment and individual deliberativeness for thick democracy.

Another implication of the study is that a set of significant predictors to estimate the probability of Internet usages vary with

different types of Internet usages. All the five demographics significantly predict the probability to be an Internet user. The probability of daily use and political use is significantly estimated by age, education and income. Age and education predict the probability of online campaign engagement while gender, race and income fail to signify estimation of the probability. The probability of using social networking sites is significantly estimated only by age. Consistently in all regression models, age is a strong predictor for dependent variables. Importantly, education differentiates between the propensity of light political use and that of more engaged, concerned political use. The probability of online political activities requiring more commitment and involvement in politics is significantly predicted by education. The level of education determines the likelihood to do political activities enhancing thick democracy [12,16,49,50,55].

Lastly, recently mushrooming activism on social networking sites does not rapidly and broadly spread out in political activities. The usage divide by age is so wide that age significantly predicts the probability to go to the sites. Though a high proportion (74%) of the whole netizens use the Internet for political purpose regardless of the depth of political activities, about half of SNS users go to the websites for political activities. The ratio of political users is disproportionate between the whole Internet users and the SNS users. Although many netizens may feel political efficacy on the sites and recognize their potential as a political sphere, the sites still play a main role as an arena for non-political (fun-oriented or relationship-seeking) connection to others rather than as a political space of public deliberation and as an organic linkage between citizens and political representatives.

7. CONCLUSION

This paper did not find out so much a salient disparity between the patterns of the divide in general use and political use of the Internet as a semblance between both patterns. Demographic characteristics that affect general use of the Internet also have a significant influence on its political usage. However, the degree to which online political activities require the Internet users to commit to and involve in campaigns determines the extent to which the pattern of the political usage divide resembles that of the general usage divide. In casual and light political activities, the patterns in the political usage divide and the general usage divide are almost alike. In contrast, the conventional demographic pattern of political participation in offline mode – the high likelihood of well-educated seniors to participate in thick democracy – would exert a strong leverage on the pattern of the democratic divide if online activities involve in political commitment to campaigns.

Though a considerable proportion of Internet users did light political activities such as political information-seeking and casual communication with others about candidates and politics during the campaign season of the 2008 presidential election, the probability to utilize the Internet for more commitment-required activities is not as high as expected. The Internet is still not a predominant medium for politics, and thus its democratic potential is not fulfilled yet [6,14,43]. Nevertheless, the functional expansion of the Internet for political engagement to date allows us to expect that the number of people who use the Internet for political purposes would keep increasing with development of various online participatory tools. Such optimistic anticipation

leaves a question for the future: Would the divide in political usage of the Internet be bridged or widened? Future studies need to figure out how the continuous increase in the number of political Internet users would change the pattern of the political usage divide by demographic characteristics. To future scholars who will research the divide in political usage of the Internet, this study sends a currently skeptic message that in the present when most Web users do not yet harness the Internet as a tool for political participation, the pattern of the political usage divide resembles that of the general usage divide.

8. REFERENCES

- [1] Bélanger, F., & Carter, L. (2009). The impact of the digital divide on e-government use. *Communications of the ACM*, 52(4), 132-135.
- [2] Bimber, B. (2001). Information and political engagement in America: The search for effects of information technology at the individual level. *Political Research Quarterly*, 54(1), 53-67.
- [3] Birdsall, S. (2005). The democratic divide [Electronic Version]. *First Monday*, 10(4) from <http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1216/1136>.
- [4] Bohman, J., & Rehg, W. (1997). *Deliberative Democracy: Essays on Reason and Politics*, Cambridge, MA: MIT Press.
- [5] Borgida, E., Sullivan, J. L., Oxendine, A., Jackson, M. S., Riedel, E., & Gangl, A. (2002). Civic culture meets the digital divide: The role of community electronic networks. *Journal of Social Issues*, 58(1), 125-141.
- [6] Brants, K. (2005). Guest editor's introduction: The Internet and the public sphere. *Political Communication*, 22(2), 143-146.
- [7] Compaine, B. M. (2001). *The Digital Divide: Facing a Crisis or Myth?* Cambridge, MA: MIT Press.
- [8] Davis, R. (1999). *The Web of Politics: The Internet's Impact on the American Political System*. New York, NY: Oxford University Press.
- [9] Davis, R., & Owen, D. (1998). *New Media and American Politics*. New York, NY: Oxford University Press.
- [10] DiMaggio, P., & Hargittai, E. (2001). *From the 'Digital Divide' to 'Digital Inequality': Studying Internet Use as Penetration Increases*. Princeton, NJ: Center for Arts and Cultural Policy Studies, Woodrow Wilson School, Princeton University, Available at <http://www.princeton.edu/~artspol/workpap/WP15%20-%20DiMaggio%2BHargittai.pdf>.
- [11] DiMaggio, P., Hargittai, E., Neuman, W. R., & Robinson, J. P. (2001). Social implications of the Internet. *Annual Review of Sociology*, 27, 307-336.
- [12] Fraser, N. (1990). Rethinking the public sphere: A contribution to the critique of actually existing democracy. *Social Text*, 25/26, 56-80.
- [13] Gibson, R., Lusoli, W., & Ward, S. (2005). Online participation in the UK: Testing a contextualized model of Internet effects. *British Journal of Politics and International Relations*, 7(4), 561-583.

- [14] Grönlund, Å. (2002). Introduction to the special issue on e-democracy in practice: Methods, infrastructures and discourse. *e-Service Journal*, 2(1), 3-8.
- [15] Guillén, M. F., & Suárez, S. L. (2005). Explaining the global digital divide: Economic, political and sociological drivers of cross-national Internet use. *Social Forces*, 84(2), 681-708.
- [16] Habermas, J. (1989). *The Structural Transformations of the Public Sphere: An Inquiry into a Category of Bourgeois Society*. Cambridge, MA: MIT Press.
- [17] Hanafizadeh, M. R., Saghaei, A., & Hanafizadeh, P. (2009). An index for cross-country analysis of ICT infrastructure and access. *Telecommunications Policy*, 33(7), 385-405.
- [18] Hanafizadeh, P., Hanafizadeh, M. R., & Khodabakhshi, M. (2009). Taxonomy of e-readiness assessment measures. *International Journal of Information Management*, 29(3), 189-195.
- [19] Hargittai, E. (2002). Second-level digital divide: Differences in people's online skills. *First Monday*, 7(4).
- [20] Hargittai, E. (2004). Internet access and use in Context. *New Media & Society*, 6(1), 115-121.
- [21] Hargittai, E. (2007a). The digital divide and what to do about it. In D. C. Jones (Ed.), *New Economy Handbook*. San Diego, CA: Academic Press.
- [22] Hargittai, E. (2007b). Whose space? Differences among users and non-users of social network sites [Electronic Version]. *Journal of Computer-Mediated Communication*, 13(1) from <http://jcmc.indiana.edu/vol13/issue1/hargittai.html>.
- [23] Hargittai, E., & Shafer, S. (2006). Differences in actual and perceived online skills: The role of gender. *Social Science Quarterly*, 87(2), 432-448.
- [24] Hargittai, E., & Walejko, G. (2008). The participation divide: Content creation and sharing in the digital age. *Information, Communication & Society*, 11(2), 239-256.
- [25] Herrmson, P. S., Stokes-Brown, A. K., & Hindman, M. (2007). Campaign politics and the digital divide: Constituency characteristics, strategic considerations, and candidate Internet use in state legislative elections. *Political Research Quarterly*, 60(1), 31-42.
- [26] Hindman, M. (2007). "Open-source politics" reconsidered: Emerging patterns in online political participation. In V. Mayer-Schönberger & D. Lazer (Eds.), *Governance and Information Technology: From Electronic Government to Information Government* (pp. 183-207). Cambridge, MA: The MIT Press.
- [27] Howe, N., & Strauss, W. (1991). *Generations: The History of America's Future, 1584 to 2069*. New York, NY: Harper Perennial.
- [28] Howe, N., & Strauss, W. (2000). *Millennials Rising: The Next Great Generation*. New York, NY: Random House.
- [29] Jackson, L. A., Eye, A., Barbatsis, G., Biocca, F., Fitzgerald, H. E., & Zhao, Y. (2004). The impact of Internet use on the other side of the digital divide. *Communications of the ACM*, 47(7), 43-47.
- [30] James, J. (2008). The digital divide across all citizens of the world: A new concept. *Social Indicators Research*, 89(2), 275-282.
- [31] James, J. (2009). Information technology use among individuals in rich and poor countries: The disappearing divide. *Telematics and Informatics*, 26(4), 317-321.
- [32] Jennings, M. K., & Zeitner, V. (2003). Internet use and civic engagement: A longitudinal analysis. *Public Opinion Quarterly*, 67(3), 311-334.
- [33] Jones, S., & Fox, S. (2009). Generations Online in 2009 [Electronic Version]. Retrieved Jul 29, 2009 from <http://www.pewinternet.org/Reports/2009/Generations-Online-in-2009.aspx>.
- [34] Margolis, M., & Resnick, D. (2000). *Politics as Usual: The Cyberspace "Revolution"*. Thousand Oaks, CA: Sage.
- [35] McChesney, R. (1999). *Rich Media, Poor Democracy: Communication Policy in Dubious Times*. Urbana, IL: University of Illinois Press.
- [36] Moore, R. K. (1999). Democracy and cyberspace. In B. N. Hague & B. D. Loader (Eds.), *Digital Democracy: Discourse and Decision Making in the Information Age* (pp. 39-59). New York, NY: Routledge.
- [37] Mossenburg, K., Tolbert, C., & Stansbury, M. (2003). *Virtual Inequality: Beyond the Digital Divide*. Washington, D.C.: George Washington University Press.
- [38] Negroponte, N. (1998). Beyond digital. *Wired*, 6(12), 288.
- [39] Neu, C. R., Anderson, R. H., & Bikson, T. K. (1998). *E-mail Communication between Government and Citizens: Security, Policy Issues, and Next Steps*. Santa Monica, CA: Rand Corp.
- [40] Norris, P. (1999). *Critical Citizens: Global Support for Democratic Governance*. Oxford, UK: Oxford University Press.
- [41] Norris, P. (2001). *Digital Divide: Civic Engagement, Information Poverty, and the Internet Worldwide*. New York, NY: Cambridge University Press.
- [42] NTIA. (2002). *A Nation Online: How Americans Are Expanding Their Use of the Internet*. Washington, D.C.: U.S. Department of Commerce. National Telecommunication and Information Administration (NTIA), Available at <http://www.ntia.doc.gov/ntiahome/dn/anationonline2.pdf>.
- [43] Papacharissi, Z. (2002). The virtual sphere: The Internet as a public sphere. *New Media & Society*, 4(1), 9-27.
- [44] Pfeil, U., Arjan, R., & Zaphiris, P. (2009). Age differences in online social networking? A study of user profiles and the social capital divide among teenagers and older users in MySpace. *Computers in Human Behavior*, 25(3), 643-654.
- [45] Poor, N. (2005). Mechanisms of an online public sphere: The website Slashdot [Electronic Version]. *Journal of Computer-Mediated Communication*, 10(2) from <http://jcmc.indiana.edu/vol10/issue2/poor.html>.
- [46] Posner, R. A. (2004). Deliberative Democracy: An Empirical Note. *Election Law Journal: Rules, Politics, and Policy*, 3(4), 698-701.
- [47] Putnam, R. D. (2000). *Bowling Alone: The Collapse and Revival of American Community*. New York, NY: Touchstone.

- [48] Rheingold, H. (2001). The virtual community. In D. Trend (Ed.), *Reading Digital Culture* (pp. 272-280). Malden, MA: Blackwell.
- [49] Scheufele, D. A. (1999). Deliberation or dispute? An explanatory study examining dimensions of public opinion expression. *International Journal of Public Opinion Research*, 11, 25-58.
- [50] Scheufele, D. A., & Nisbet, M. (2002). Being a citizen online: New opportunities and dead ends. *The Harvard International Journal of Press/Politics*, 7(3), 55-75.
- [51] Shah, D., Kwak, N., & Holbert, R. (2001). 'Connecting' and 'disconnecting' with civic life: Patterns of Internet use and the production of social capital. *Political Communication*, 18(2), 141-162.
- [52] Shelley, M. C., II, Thrane, L. E., & Shulman, S. W. (2006). Lost in cyberspace: barriers to bridging the digital divide in e-politics. *International Journal of Internet and Enterprise Management*, 4(3), 228-243.
- [53] Shirazi, F., Ngwenyama, O., & Morawczynski, O. (2010). ICT expansion and the digital divide in democratic freedoms: An analysis of the impact of ICT expansion, education and ICT filtering on democracy. *Telematics and Informatics*, 27(1), 21-31.
- [54] Steyaert, J. (2002). Inequality and the digital divide: myths and realities. In S. Hick & J. McNutt (Eds.), *Advocacy, Activism and the Internet* (pp. 199-211). Chicago, IL: Lyceum Press.
- [55] Straits, B. C. (1991). Bringing strong ties back in interpersonal gateways to political information and influence. *Public Opinion Quarterly*, 55, 432-448.
- [56] Stromer-Galley, J. (2002). New voices in the public sphere: A comparative analysis of interpersonal and online political talk. *Javnost-The Public*, 9(2), 23-42.
- [57] Tolbert, C., Mossenberger, K., & McNeal, R. (2002, Aug 28). Beyond the digital divide: Exploring attitudes about information technology, political participation, and electronic government. Paper presented at the annual meeting of the American Political Science Association, Boston, MA.
- [58] Valovic, T. S. (2000). *Digital Mythologies: The Hidden Complexities of the Internet*. New Brunswick, NJ: Rutgers University Press.
- [59] van Dijk, J. A. G. M. (2005). *The Deepening Divide Inequality in the Information Society*. Thousand Oaks, CA: Sage.
- [60] van Dijk, J. A. G. M. (2006). Digital divide research, achievements and shortcomings. *Poetics*, 34(4-5), 221-235.
- [61] Vromen, A. (2007). Australian young people's participatory practices and internet use. *Information, Communication & Society*, 10(1), 48-68.
- [62] Warschauer, M. (2004). *Technology and Social Inclusion: Rethinking the Digital Divide*. Cambridge, MA: MIT Press.