

INTERNATIONAL UNIVERSITY OF JAPAN
Public Management and Policy Analysis Program
Graduate School of International Relations

ADC 5032301 (2 Credits)
Information Policy and Management
Fall 2018

Digital Inequality

This note is used only for the class but may not be used as a substitution of required readings. Notice that it contains instructor's personal opinion that has NOT been discussed and examined yet in academia.

Digital divide (digital inequality) is the gap between people who have Internet access and do not, or between information “haves” and “have-nots.”¹ Generally speaking, digital divide is inequality in (1) access to, (2) use of, and (3) knowledge (obtained from the Internet) of information and communication technology, specifically the Internet, between groups in different socio-economic status such as gender, income, education, age (generation), ethnicity (race), employment, disabilities, and geographical area (rural versus urban).

As computer and Internet penetration rates become high enough, inequality in access becomes less important than the use and knowledge of the Internet since socio-economic statuses do not play key roles.

Digital Divide and Digital Inequality

The “Quality of use” became more important than a binary question of whether an individual has access to the Internet or not (DiMaggio and Hargittai 2001). “[T]he ability to log on to the Internet differs from the ability to pick up a receiver and find a dial tone in that the range of uses to which one can put the Internet, and the extent to which many of these uses depend on the quality of connections and equipment, user know-how, and social support, are far greater than was the case for the telephone even a decade ago” (p. 7). Katz and Rice (2002) puts, “Traditional measures of the digital divide have relied on a binary measure of adoption or a simple measure of time spent using the technology ... They do not consider the extent to which the technology is incorporated into daily life or its effect on status or upward mobility, thus avoiding the social context” (p. 28). Digital inequality appears to be more appropriate terminology than dichotomous digital divide although their meanings are virtually identical in practice.²

Dimensions of Digital Inequality

DiMaggio et al. (2004: 376-380) discuss five dimensions of digital inequality.

- Inequality in technical means: hardware, software, and connections (broadband)

¹ “Information haves” and “information have-nots” appear to be quite ambiguous. How can we distinguish two groups in practice? Internet access itself is not equivalent to “information haves.”

² DiMaggio et al. (2004) calls for a shift from “binary fashion” of Internet access to Internet use in order to consider multiple purposes (preference) and different level (knowledge and skills) of Internet use.

- Inequality in autonomy of use: Where do users have access? “To what extent is use circumscribed by regulations, time limits, filters or other technical impediments to access” (DiMaggio and Hargittai 2001: 9).
- Inequality in the knowledge and skills: Internet competence
- Inequality in social support from more experienced users
- Inequality in the purposes for which an individual uses the Internet (e.g., economic welfare; political or social capital; and entertainment—gambling and games)
- Global digital divide (Norris 2001): “cross-national variation in Internet access and use” (p.14).
- Katz and Rice (2002) consider divides in access and also examine divides in cohort, awareness, and dropouts.

Conceptual Problems in Digital Inequality

What is the goal of digital inequality notion? What is the ideal state that the notion wants to achieve? Is that *digital equality* where all people have the same access to and use of the Internet? Or removal of any discrimination in Internet access and use? Are Internet access and use always desirable for individual and society as a whole? What if Internet use results in negative consequences? Digital inequality implies that inequality is bad and thus needs to be minimized. Is zero digital inequality always feasible (possible) and desirable?

When discussing digital inequality with respect to social efficiency and welfare, we need to consider at least (1) *uses' ability*, (2) *actual need* (purposes of Internet use), and (3) *willingness to use the Internet*. Specifically, users have to have (1) money to purchase hardware, software, and Internet connection, (2) knowledge and skills to use the Internet effectively, and (3) time to use the Internet. Similarly, DiMaggio et al. (2004) posit hardware and software, skill, and social support (p. 382). Digital inequality literature appears to focus largely on user's financial ability to purchase computer and broadband connection.

Also users have their need to use the Internet for business and daily life. Existing digital inequality notion implicitly assumes that all users (should) have the same level of need (demand) for the Internet and they can benefits (positive consequences) from using the Internet without paying enough attention to use of the Internet for such nonproductive or negative purposes as gaming, gambling, pornography, wasteful entertainment, crime and terror, etc. Each user has different need for the Internet and different ability to use the Internet.

Existing discussion also implicitly assumes that all groups of people (e.g., gender and generation) have the similar willingness to use the Internet and want to use the Internet if available. These assumptions are not realistic although not easy to prove them empirically.

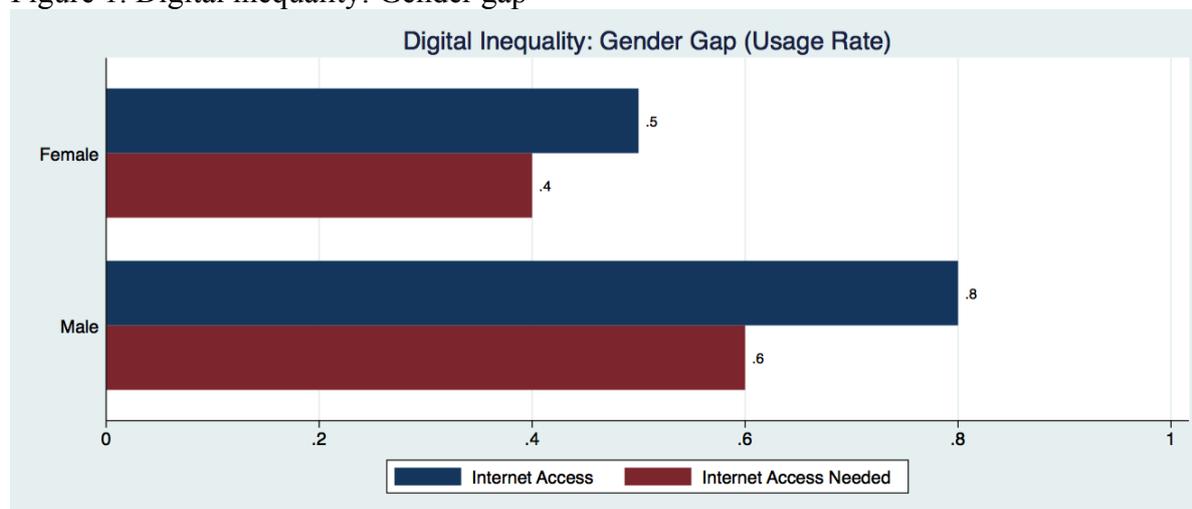
Simple Illustration of Gender Digital Inequality

Suppose 80 percent of men and 50 percent of women are using the Internet in a society (Figure 1). The difference 30 percent ($=.8-.5$) may be called gender digital inequality. Accordingly eliminating the difference appears to be the policy goal. But what does “eliminating the difference” mean? Is it the 80 percent for both men and women? Why not 50 percent? What about 0 percent or 100 percent (although this equality is not possible, of course)? Which figure do you think is the best for society and why?

Is this (mechanical) equality desirable to the society? Suppose we agree on 80 percent of Internet access as a policy goal and accordingly government invests billion dollars on this digital equality project. The question is, “Is this 80 percent of Internet use desirable for the society?”

We must be aware that the Internet is NOT free goods, but a scarce resource like gold and water that need to be used efficiently. The Internet requires a huge amount of money. The Internet becomes *rivalrous* in case of congestion. Accordingly, we have to use public money and the Internet efficiently and effectively. Microeconomics says that the optimal distribution of scarce resources is determined at the point where demand (need) and supply curves are met.

Figure 1. Digital inequality: Gender gap



What about 100 percent? Does the 100 percent guarantee the optimal value of social efficiency and welfare? Why and why not? It is impossible to reach 100 percent even under a dictatorship. Similarly, a dictator cannot prohibit completely citizens from using the Internet (0% of Internet use). Neither 0 nor 100 cannot be the solution that maximizes social efficiency and welfare.

Users' Need (Demand and Purposes)

Unlike telephone, the Internet can be used for multiple purposes, such as email, chatting (text, video, and audio), information search, financial transaction and shopping, entertainment (audio and video clips), and gambling. Suppose we can distinguish productive Internet use and others despite difficulty doing this job technically and conceptually (e.g., musician's listing to audio clips will be an Internet use for productivity).

Suppose 60 percent of men and 40 percent of women actually need to use the Internet mainly for productivity (Figure 1). 20 percent (=0.8-0.6) of men and 10 percent (=0.5-0.4) of women use the Internet largely for non-productive purposes. (Some may argue that listening to music will improve productivity though). Both 20 and 10 percent are just waste of scarce resources in the economic sense. The gender different in Internet use here does not matter in the market logic of microeconomics. If government provides subsidy to women so that women's penetration rate reach 80 percent, government will achieve digital equality but waste public money.

Then, we are able to know the optimal Internet use rates at which social efficiency can be maximized. The optimal rates are 60 percent for men and 40 percent for women. Accordingly female's rate needs to decrease down to 40 percent and men's rate down to 60 percent in order to reach social efficiency (best way to use the scarce resources). Since actual Internet use rates are larger than the optimal rates, government does not need to take any special action (digital equality project) to diminish this inequality. In my opinion, there is no digital inequality although women use the Internet less than men. Internet use beyond the optimal rate reflects personal choices (not essential for their survival and normal life).

What if 90 percent men and 70 percent of women really need the Internet for productive purposes? Additional 10 percent ($=.9-.8$) and 20 percent ($=.7-.5$) of men and women respectively need to use the Internet. The difference of 10 percent ($=.2-.1$), for example, may be called gender digital inequality. Or you may calculate satisfaction rates ($.8/.9$ for men and $.5/.7$) and then get their difference ($17.5\%=88.9-71.4$) for digital inequality.³ Remember that DiMiggio et al (2004) showed that different measures of inequality produce different results (pp. 363, 366). Then government may undergo a digital inequality project to increase Internet use rates to the optimal rate that society agrees. Government will invest more money and effort on women to take care of large gap.

Users' Willingness

Internet non-users are grouped into voluntary non-users (VNU) and non-voluntary non-users (NVNU). *Voluntary non-users* are those who have sufficient resources (i.e., money and time) and knowledge (skills) to use the Internet but do not like using the Internet for various reasons. *Non-voluntary non-users* want to use the Internet but do not have sufficient resources and knowledge.

The presence of voluntary non-users makes digital inequality discussion more complicated. Government intervention (digital equality project) will be effective only for non-voluntary non-users and have no or negative consequence for voluntary non-users. Some voluntary non-users may feel that the intervention is waste of money or absurd pressure to use the Internet forcefully. Therefore, 100 percent Internet use, contrary to common expectation, will not produce maximum social efficiency and welfare (voluntary non-users will feel efficiency loss and welfare loss at the "100 percent" of Internet use; that is, they don't like the "100 percent").

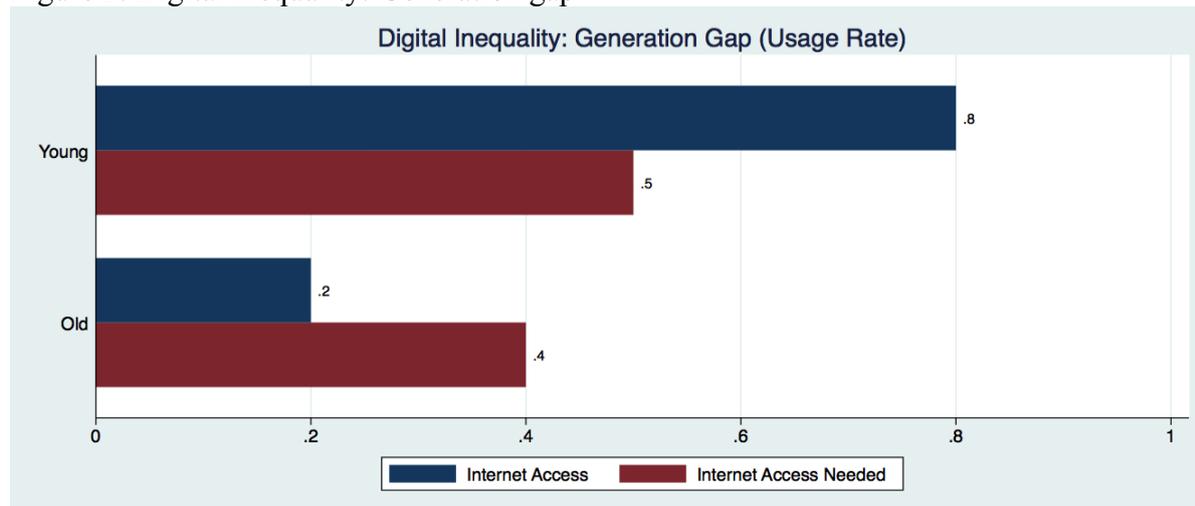
When Digital Inequality Is Meaningful

Now suppose 80 percent of the young below twenty and only 20 percent of the old generation older than sixty are using the Internet (Figure 2). The huge gap of 60 percent ($=.8-.2$) is conventionally reported as a generation digital inequality. This 60 percent of gap, however, appears to represent the difference in users' ability and willingness to use the Internet between old and young generations. This difference differs from social (or systematic) discrimination against the old generation. But what if 50 percent of the young and 40 percent of the old need the Internet access for productive purposes (e.g., education or business)?

³ These 10 percent and 17.5 percent are different from 30 percent of existing digital inequality notion.

We may interpret this circumstance as follows. The 30 percent of the young (=.8-.5) have ability and knowledge but use the Internet for non-education purposes (e.g., gaming and watching meaningless video clips) and 20 percent (1-.8) do not have ability (i.e., money, time, and knowledge) to use the Internet (assuming almost all young citizens want to use the Internet). This 30 percent is considered as surplus or overuse (if not misuse). By contrast, 20 percent of the old (=.4-.2) need the Internet connection for their life but cannot use due to lack of ability (e.g., money, knowledge, and skills). This 20 percent is considered as frustration of unsatisfied Internet need. The remaining 60 percent (=1-.4) are not able to use the Internet due to the lack of money and/or knowledge.

Figure 2. Digital inequality: Generation gap



Then how do we define digital inequality? Where is the ideal usage rate at which digital inequality disappears? 80 percent for old and young generations? The market logic says 50 percent for young generation and 40 percent for old generation are optimal rates of Internet use for social welfare and efficiency. Then how can we “control” Internet use to discourage overuse or less productive use of the Internet and encourage productive use?

Digital Inequality and Technological Development

Information technology changes fast and makes things more complicated. Like information systems, the Internet also has both technological and social aspects that should be considered in decision-making.

“[T]he access to and use of the Internet is continually transformed by the interactions of corporations’ strategic choices, individual users’ responses to these choices, programmers’ decisions about code (Lessig 1999), and government regulation (including intellectual property legislation, privacy rulings, antitrust actions, and economic regulation)” (DiMaggio and Hargittai 2001: 15).

When the Internet penetration rate is very low in a society (e.g., 5%), digital inequality is not the pending issue and the magnitude of inequality is not significant (large). On the contrary, if the penetration rate is high enough (e.g., 90% of Internet penetration rate), digital inequality will be a minor issue because, as shown in the first example above, actual rates are higher than the optimal rates. Therefore, digital inequality will not be significant.

Socio-economic status such as age, gender, and education is closely related to the tradition and culture of a society. In general, information technology use reflects how the society has been shaped. Willingness to use and need for productivity reflect the social landscape. As a consequence, simple comparison of Internet use across countries (global digital divide) may be misleading. For example, 30 percent of female Internet use in an Asian country and corresponding 60 percent in the United States might be considered equivalent even when both countries show the same digital inequality (Try to explain).

References

- DiMaggio, Paul, and Eszter Hargittai. 2001. From the 'Digital Divide' to 'Digital Inequality': Studying Internet Use as Penetration Increases. Working Paper Series 15, Center for Arts and Cultural Policy Studies, Princeton University.
- DiMaggio, Paul, Eszter Hargittai, Coral Celeste, and Steven Shafer. 2004. Digital Inequality: From Unequal Access to Differentiated Use, In *Social Inequality*, ed. Kathryn M. Neckerman, 355-400. New York: Russell Sage Foundation.
- Jesse, Jolene Kay. 2004. The Digital Divide: Policy Myth or Political Reality? In *Chasing Moore's Law: Information Technology Policy in the United States*, ed. William Aspray, 247-272. Raleigh, NC: SciTech Publishing.
- Katz, James E., and Ronald E. Rice. 2002. *Social Consequences of Internet Use: Access, Involvement, and Interaction*. Cambridge, MA: MIT Press.
- Norris, Pippa. 2001. *The Digital Divide: Civic Engagement, Information Poverty, and the Internet Worldwide*. New York: Cambridge University Press.