CLOSING THE DIGITAL DIVIDE
The Role of Digital Technologies on Social Development, Well-Being of All and the Approach of the Covid-19 Pandemic.

Professor Jan A.G.M. van Dijk, University of Twente (NL)

Main statements

- Currently, digital inequality reinforces existing social inequality.
- The digital divide cannot be closed completely. When the whole world population would reach access to the digital media such as the Internet, inequalities of digital skills, usage and outcomes or benefits remain and even tend to grow.
- Until recently, digital divide policy was focused on physical access. Now improving digital skills, better Internet usage opportunities or benefits and building awareness of positive attitudes of the Internet regulating negative uses are becoming more and more important.
- Policy perspectives to solve the digital divide need to be multidimensional: technological, economic, educational, social and persuasive (creating awareness).
- Policies to close the digital divide have to reduce social and digital inequality simultaneously.
- The current Covid-19 pandemic reinforces both existing social inequalities and digital inequality. Nevertheless, supporting reliable and useful information and communication about Covid-19 on the Internet and mobile phones is the best policy to mitigate digital inequality and to fight against the virus.

Access of digital media and inequality

The digital divide is a complex and dynamic phenomenon. There are several digital divides and they are continually changing. The access to digital media such as computers and the Internet is a process that starts with a motivation and a positive attitude for using these media. Then people need physical access getting a type of computer and an Internet connection. This is not enough: the next phase is to develop a series of digital skills. After these phase people can use all kinds of applications that are relevant for them. Finally, they hope to find the benefits of using these media. Of course, the outcomes are the main objective of this process.

In the last 25 years digital divide research and policy has moved at three levels[1]. Until about the year 2010 physical access was the main interest for both research and policy. Having some type of computer and Internet connection for everybody was the main objective. This is called the First Level of digital divide research and policy in the literature. After some time both researchers and policymakers were convinced that digital literacy or skills and usage are in fact more important in talking about digital inequality. This is called the Second Level. Since about

---

[1] Scheerder A, van Deursen AJAM, van Dijk JAGM. Determinants of Internet skills, uses and outcomes. A systematic review of the second- and third-level digital divide. *Telematics and Informatics* 2017;34:1607-1624. doi:10.1016/j.tele.2017.07.007

2015 the outcomes of computer and Internet use came forward in a Third Level of digital divide research and policy. By that time not only positive outcomes were observed but also negative ones such as cybercrime, illegal hacking, hate speech and disinformation on the social media and smartphone, Internet or game addiction.

This process of four phases of access is the core of a theory about the digital divide called *Resources and Appropriation theory* developed and tested in many surveys during the last 25 years by the author of this paper.[2] The main statement of this theory is that particular personal and positional categories of individuals have more or less resources in following this four phases process and its outcomes or benefits, a process called appropriation of a technology. All these factors can be perceived in a model that has shown to be fitting to the data in many countries (see Figure 1).
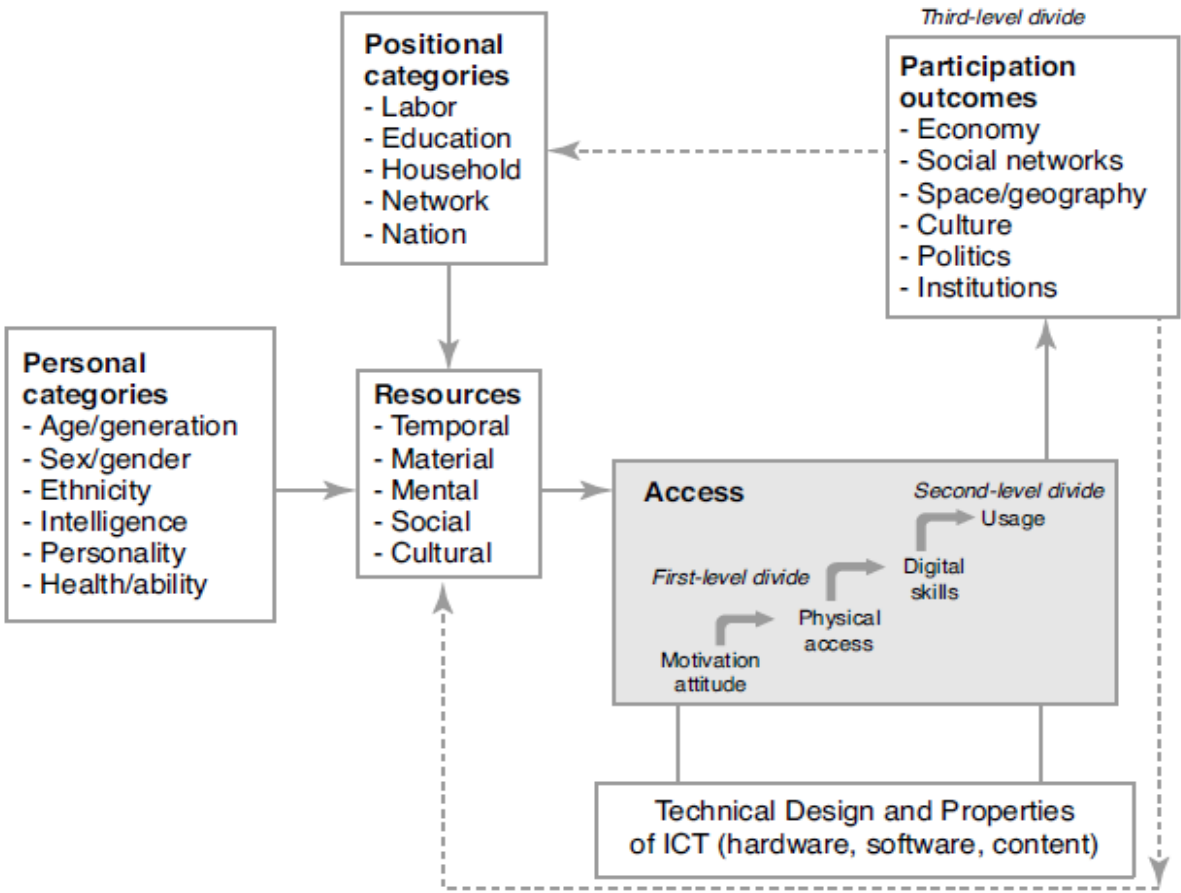
Figure 1: A Causal Model of Resources and Appropriation Theory of the Digital Divide

Today, the categories of age, gender, ethnicity, labor, education and nation or region are the most important factors in explaining digital inequality in all phases. These categories have unequal resources such as material (income), mental (knowledge), social (relationships) and cultural capital. In the last 25 years the categories at the 'right side' of the digital divide were young people, people with high education and occupations, in many countries first of all males, the ethnic majority in a country and people living in an urban environment and in developed countries. At the 'wrong side' of the digital divide were elderly people, people with low education and low occupations or being unemployed, often females, ethnic minorities and people in rural

---

[2] Jan van Dijk (2005). *The Deepening Divide*, Sage Publications and Jan van Dijk (2020). *The Digital Divide*, Polity Press.

environments and developing countries. Between 1995 and 2010 the digital gaps between these categories were only widening. Currently, some of the gaps are slowly closing (motivation and physical access) while the gaps of digital skills, usage and outcomes are still widening (see Note 2 and below). In many countries the gender gap has disappeared[3]

Motivation of wanting to use a computer or the Internet has grown substantially since the 1990s in the whole world. Though negative outcomes of Internet use have become to the fore in the last ten years, positive attitudes of wanting to use the Internet still dominate in surveys worldwide.

In terms of physical access developed countries have about 70 to 98 percent Internet access while developing countries still average around 40-42 percent. On average, half of the world population have now Internet access and at least one access device (from PC to smartphone). However, since the year 2000 the gap between developed en developing countries in physical access is still widening (in 2000 it was 29% and in 2018 it was 40%). See Figure 2.
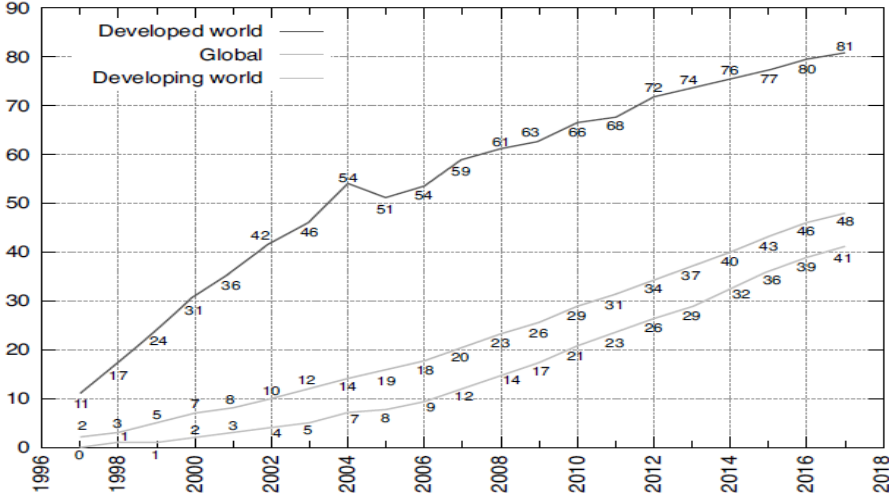
Figure 2: Internet Users per 100 Inhabitants in Developed and Developing Countries (ITU)

The following decade this gap is expected to close partly. In the mean time technological development is not halting. Even in a rich country with 98% Internet access, the Netherlands, we have observed that some people (especially with high income and education) have several access devices and many subscriptions and apps while others (with low income and education) only have one[4]. Worldwide people with low income, education and social class hope to catch-up with using a mobile or smartphone. This type of device is the hope for the developing countries at least getting access via one medium, but in this way they cannot 'leapfrog' technological phases of evolution. Some observers are talking about the appearance of *'mobile underclass'* in both developed and developing countries[5]. Mobile (smart) phones are still inferior in work, education, business and citizen use as compared to PCs and laptops with fixed and broader connections.

---

[3] I.T.U. (2018). *Measuring the Information Society Report, Volume 1*, ITU: International Telecommunication Union, Geneva.

[4] Van Deursen AJAM, van Dijk JAGM. (2019) The first-level digital divide shifts from inequalities in physical access to inequalities in material access. *New Media & Society 2019*; 21(2):354-375. doi:10.1177/1461444818797082

[5] Napoli PM and Obar JA (2014) The Emerging Mobile Internet Underclass: A Critique of Mobile Internet Access. *The Information Society* 30(5): 323-334.

The next phase is digital skills or literacy. We have developed a framework of six digital skills. Primary medium-related skills are operational and formal (navigation) skills. Advanced content-related skills are information, communication, content creation and strategic skills[6]. Here the differences in populations are big and growing[7]. Especially, people with high education and occupations are superior to people with low education and manual jobs concerning content-related digital skills. In terms of operational and formal skills young people are much better than seniors. However, a surprise for the readers might be that seniors are better in content-related skills than young people[8]! Probably because of their experience in life, work and education.

In usage of the digital media/the Internet differences between personal and positional categories have grown in the last 25 years[9]. The main causes are 1. the growing social and cultural differentiation of modern society and 2. the growth of all kinds of Internet and mobile applications. The result is that people with different social class, age, gender, ethnic and cultural origin and other backgrounds are increasingly using the Internet differently. A structural divide observed here is called the *usage gap*: people with high education and social class use more informational, educational, work and career enhancing applications and people with low education and social class primarily use applications of entertainment, chat or simple communication and e-shopping[10].

The final phase is benefitting from Internet use. Unfortunately, those people at the right side of the digital divide report more positive outcomes of Internet use in all domains of society (economy, social, politics, cultural etc.) and are better prepared to cope with the negative outcomes. Those people at the wrong side of the divide report the flipside of these observations[11].

All these phases and divides show that existing social inequalities of all kinds are reflected in digital inequalities. In practice they are even reinforce these old inequalities because the inequality of outcomes support better or worse resources and participation in society: on the job market, in politics and citizenship, social networking and cultural (online) activities. When I started my research about the Internet in the 1980s I was optimistic that this promising new medium would support equality because it is relatively cheap offering free information and apps and because it is easier to use than particular traditional media (for instance consulting a library). After 25 years of research I am disappointed. The opposite has happened. The main conclusion

---

[6] Van Dijk, Jan A.G.M. and van Deursen, Alexander J.A.M. (2014). *Digital Skills, Unlocking the information society.* New York: Palgrave Macmillan.

[7] Van Deursen, A., & van Dijk, J. (2014a). Internet skill levels increase, but gaps widen: A longitudinal cross-sectional analysis (2010–2013) among the Dutch population. *Information, Communication & Society*, 18(7), 782–797

[8] van Deursen, A. J. A. M., van Dijk, J. A. G. M., and Peters, O. (2011) Rethinking internet skills: the contribution of gender, age, education, internet experience, and hours online to medium- and content-related internet skills, *Poetics*, 39(2): 125–44.

[9] Blank G, Groselj D. Dimensions of Internet use: amount, variety, and types. *Information, Communication & Society 2014*; 17(4):417-435. doi:10.1080/1369118X.2014.889189.
Van Deursen AJAM, Van Dijk JAGM, Ten Klooster PM. Increasing inequalities in what we do online. A Longitudinal Cross-Sectional Analysis of Internet Activities among the Dutch Population (2010 To 2013) over Gender, Age, Education, and Income. *Informatics and Telematics 2015*; 32(2):259-272. doi:10.1016/j.tele.2014.09.003

[10] Zillien N, Hargittai E. Digital distinction: Status-specific types of internet usage. *Social Science Quarterly* 2009;90(2):274-291. doi:10.1111/j.1540-6237.2009.00617. Also see Note 8.

[11] Van Deursen AJAM, Helsper EJ. Collateral benefits of Internet use: Explaining the diverse outcomes of engaging with the Internet. *New Media & Society 2018*; 20(7): 2333-2351. doi:10.1177/1461444817715282; Jan van Dijk (2020) *The Digital Divide.* Cambridge UK, Medford MA USA: Polity Press.

of my last book called *The Digital Divide* argues that unfortunately digital inequality reinforces existing social inequality. How can we turn the tide? This is the next question to be answered.

Closing the digital divide?

Considering all these kinds of digital divides we have to conclude that the digital divide can 'never' be fully closed. Motivation and positive attitudes about the Internet have grown since the 1990s though negative effects of Internet use have appeared. Physical access is growing and we can expect that in two decades about 75-80% of the world population will have Internet access. However, technology changes. With new types of digital media the history of physical access will be repeated: the Internet of Things, Augmented and Virtual Reality and others are first adopted by young people with high education and income. Some will possess all digital media and others only one type. Yet, the most important trend is that access problems are shifting from physical to skills an usage access[12]. The more advanced the Internet applications become, the more digital skills are needed, especially content-related skills (information, communication, strategic). The more applications are offered, the more they are used differently by particular groups of people.

Because social inequality is increasing in many parts of the world, digital inequality will follow. The simple reason is that digital media are important tools that tend to support people with high positions more than those with low positions. Digital inequality is of a *relative* kind (more or less) and not absolute (have or have not).

Dimensions and priorities of digital divide policies

As the digital divide is shifting from physical access to skills and usage policies to close or to mitigate the digital divide also have to shift. This appears to happen today. Until recently digital divide policy in the world was completely focused on physical access. While this might still be the first priority in the developing countries in a global policy perspective we are shifting to problems of skills and usage[13]. In Table 1 (p.134 of my book) are the five perspectives of policy.

Perspective	Goal	Primary indices	Focus in phase of appropriation
Technological	Creation and distribution of digital technology	Availability	Physical access
Economic	Support markets, competition and innovation	Affordability	Physical access Usage: collective
Educational	Formal and adult education of ICTs	Readiness	Digital skills
Social	Inclusion and participation of all	Affordability, readiness, relevance	Usage: individual
Persuasive	Awareness	Relevance	Motivation/attitude

---

[12] Van Deursen AJAM, van Dijk JAGM. The Digital Divide Shifts to Differences in Usage. *New Media & Society 2014*; 16(3):507-526. doi:10.1177/1461444813487959; van Deursen, A. J. A. M., and van Dijk, J. A. G. M. (2015a) Internet skill levels increase, but gaps widen: a longitudinal cross-sectional analysis (2010–2013), *Information, Communication & Society*, 18(7):782–97.

[13] See for instance World Bank (2016). *World development report 2016: Digital dividends*. International Bank for Reconstruction and Development / The World Bank, Washington DC and The Economist Intelligence Unit (2019) *The Inclusive Internet Index 2018*, https://theinclusiveinternet.eiu.com/assets/external/downloads/3i-executive-summary.pdf.

When until about the year 2010 technological and economic perspectives completely dominated all government and other public institutions policies, today educational, social and persuasive (building awareness) perspectives come forwards. In fact all these perspectives are needed simultaneously. However, the educational, social and persuasive perspectives *need more time and effort* for social development and well-being for all and for the fight against the Covid-19 pandemic (see below).

Reducing both social and digital inequality

The next main conclusion is it is impossible to lessen digital inequality without reducing the cause of it: existing social inequality. As many observers notice that economic and social inequality are rising in large parts of the world we are confronted with the fact that closing the digital divide is an uphill struggle of simultaneously fighting against digital and social inequality. The following five strategies are my solutions[14]:

- maintain or revitalize social mobility
- increase the number of long-term social programmes adapted to disadvantaged groups in their own communities
- provide cheaper digital technology
- design digital technology that is easier to use
- draw up rules and regulations to manage the beneficial use of digital media.

The most important strategy is to improve social mobility. This means more and better employment and relatively more fixed jobs instead of flexible and insecure jobs. It also means better opportunities of education for all, with both traditional and digital media means. For the developing world all barriers mentioned in the *UNDP Human Development Reports* have to be removed as much as possible. The other four very general strategies are specifically focused on digital inequality taking into account social inequality. For a list of 21 specific solutions focusing especially on digital inequality and all phases of access see Annex 1.

The Covid-19 pandemic reinforcement of inequality and how to reduce it

Not surprisingly, the same story is happening with the effects of and reactions on the Covis-19 pandemic. It is now widely acknowledged that the poor and those with bad housing and low-paid jobs are most in danger and effected by this virus. People living in densely packed housing in poor communities, not to mention shanty towns, people living and working on the streets and in informal trade and industry have the most chance of being infected. Flexible and insecure jobs are in poor working conditions in crowded buildings or in public transport, restaurants and cleaning with frequent contacts with other people. Their jobs and those of the informal economy are the first to disappear. People with low jobs or social class on average have the worst health condition suffering from obesity, lung problems and the effects of smoking and junk food. In many countries they have no, or minor health insurance and they have to go to low quality hospitals with less chances to survive the disease.

---

[14] Jan van Dijk (2020) *The Digital Divide*. Cambridge UK, Medford MA: Polity Press, p. 155

The middle class and professionals have better and often fixed jobs that during the outbreaks of the virus have more opportunities to work online at home. Their children have much more opportunities (equipment and parent support) in online education when schools are locked than children of the working and underclasses.

There are more of these conditions that show that both social and health inequality (chances to be infected) are increasing in the pandemic situation. A logical conclusion is that because the disadvantaged have a higher chance to be infected and to infect others, while they have lesser chances to prevent this or to be cured.

In the list of conditions mentioned online work and online education are the only examples related to digital inequality. But there are many more. To describe them I will gratefully benefit of a very recent nation-wide investigation about the effect of Covid-19 pandemic on digital inequality in the Netherlands of my colleague Professor Alexander van Deursen[15]. Though this only observes the relatively rich Dutch population with high access the results will even be more severe for poor countries with less access.

A nation-wide representative survey in April 2020 among 1733 respondents of the Dutch population has revealed most of the digital divide causes in (not) using the Internet for Covid-19 information and communication listed in the model of Figure 1.

The survey looked at *the need* the *actual use* and the *outcomes* of the Internet for information and communication concerning Covid-19. The information needs are evident: people want to know what the virus means, what the symptoms are and hope to prevent the disease. They also want to know which measures are suggested or imposed. They can consult all kinds of sites, apps and social media. The outcomes might be better information about the disease, prevention of being infected and to understand why particular measures are necessary. This information reduces the risks of becoming infected and creates more awareness of one's own behavior.

The communication needs are equally obvious asking relatives and friends about the risks and approach of the disease, asking questions in the social media or consulting doctors and giving advice and support for others. The communication outcomes might be getting support and advice for protection, to share concerns about the crisis and feeling less alone.

The first result of the survey is that those with the best access to the Internet, especially having the motivation and positive attitude to use the Internet, the best material access (all kinds of digital media used) and good digital skills used more Internet Covid-19 information and communication applications and benefitted most about its useful information and communication outcomes. Positive attitudes of using the Internet (trust) were important because this medium is good for specific and personal problems or questions. Especially, when people are at home most of the time and the other information sources left there are broadcasting and the press. Physical access of the Internet is necessary of course and material access matters because all digital media have different opportunities to inform and communicate.

However, the most important access type for inequal use and outcome was having more or less digital skills. Equally, traditional literacy, the level of reading and writing attained appeared to be important. This is understandable because Covid-19 is an new, unknown and complicated

---

[15] Alexander van Deursen (*forthcoming; not yet published*) Digital Inequality During a Pandemic: Differences in COVID-19-Related Internet Uses and Outcomes among the General Dutch Population.

disease with characteristics that are often described in difficult medical language that is not easy to read. Digital skills also are needed to find reliable and valid information about the disease and to communicate about the findings. Those with a high level of digital skills were to found to receive more and better information about Covid-19 on the Web and benefitted more in the outcomes.

The demographics in this survey covered the personal and positional categories and the resources people have in getting access and use of the Internet (see Figure1). The most important results included age, gender, level of education, and health status or perception. In terms of *age* the elderly seems less equipped to use Covid-19 web-information and communication, although they are more at risk in having severe complications by this disease. The main reason was a lack of digital skills and traditional literacy. People with high *education* used and benefitted more Internet information and communication than people with low education. However the good news is that people with low education were just involved in at least trying to use information and communication applications on the Internet, probably because the crisis is vital for them too.

Gender differences were not pronounced. However, surprisingly Dutch males were more involved Covid-19 communication than females -traditionally more looking for health information in all media-. The health psychological literature explains this noting the male reaction to a crisis situations[16]. Obviously, people in good *health (status)* looked less for Covid-19 web-information and communications. However, people with a high (good) *health perception* were looking more for this information than those with a low perception, which is a surprising result. Probably elderly people use the Internet less for Covid-19 information.

The general conclusion of the survey is that people with better positions who have more access, skills and usage of the Internet benefitted most of information and communication outcomes related to Covid-19. More information about the disease and better following the advice of measures of the authorities and more Web-support when they thought to be sick. Conversely, people with low social positions and worst access to the Internet were benefitting less of all these outcomes and followed advice and measures less. So, those who need Covid-19 information and communication the most (the elderly and the poor) are using it less. So, **digital inequality also makes the pandemic worse.**

Fortunately, resources such as income and having a large social network made no difference. The reason is that the Netherlands is a rich country with very high Internet access. Therefore also people with low income are able to use Covid-19 information on the Internet. - Though they frequently use social media which are often unreliable in Covid-19 information.- Unfortunately, we have to conclude **that the situation will be much worse in poorer countries with less Internet access** and populations mainly informed via mobile social media.

Jan A.G.M. van Dijk (68) is emeritus professor of communication science and sociology of the information society and still working at the University of Twente, the Netherlands. His main domains of research are the social aspects of the digital media, digital democracy and the digital divide. His best known books are *The Network Society* (Four Editions), *Digital Democracy* (2000), *The Deepening Divide* (2005), *Digital Skills* (2014), *Internet and Democracy* (2018) and *The Digital Divide* (2020). During his long career he was an advisory of many governments and departments and the European Commission.

---

[16] Lachlan KA, Spence PR, Nelson LD. Gender differences in negative psychological responses to crisis news: The case of the I-35W collapse. *Communication Research Reports* 2010;27(1):38-48. doi:10.1080/08824090903293601

Annex
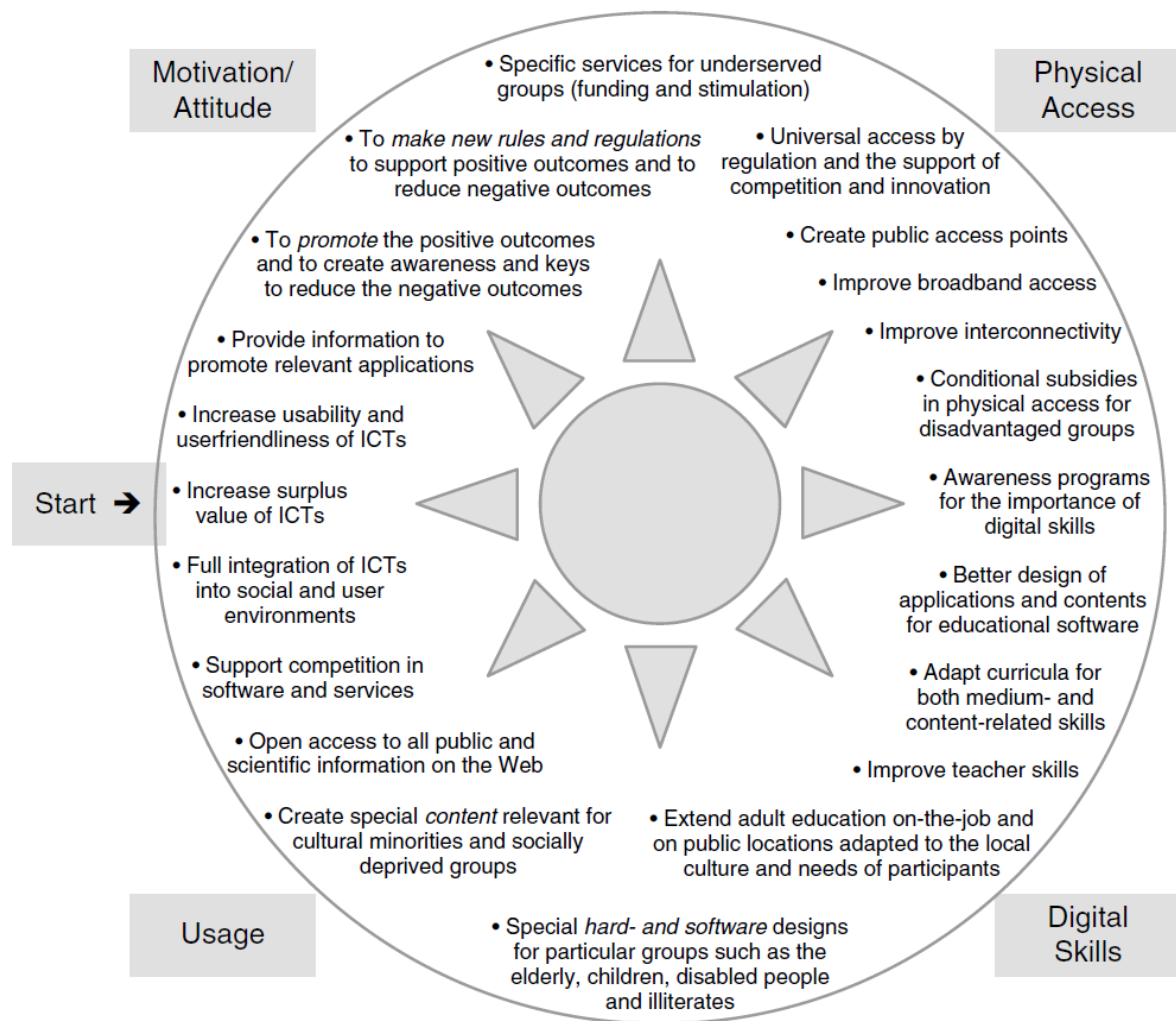
Figure 3: A Wheel of Policy Instruments to Bridge the Digital Divide
Source Jan van Dijk (2020) The Digital Divide, p. 149