The Challenges of Online Learning in Covid-19 Pandemic Era

Elih Sudiapermana[1*] Muslikhah[2]

[1,2] Faculty of Education, Universitas Pendidikan Indonesia, Bandung, Setiabudhi 229, Indonesia

Corresponding author. Email: elsud@upi.edu

ABSTRACT

The Covid-19 pandemic has made school services done through online learning. Although the development of ICT-based learning has been introduced for a long time, most schools in Indonesia still use conventional methods for its learning process. Therefore, many problems were faced when the Covid-19 pandemic occurred, such as the readiness of technology infrastructure, human resources, and systems management. This study aims to explore the challenges of implementing learning process during the Covid-19 pandemic era, in terms of (1) infrastructure and (2) digital competence in online learning at elementary schools. This quantitative descriptive study was conducted using a survey method. The primary data were collected from parents, teachers, and elementary school students who were selected purposively by considering the geographical location and the socio-economic status of parents in Bandung. Data collection was carried out through a designed questionnaire of google-form, and its distribution was carried out through the Parents' WhatsApp at school group. Data analysis was performed using percentage techniques (%) and non-parametric statistic tests of difference for more than two groups (Chi-Square). The results showed that: (1) The education level of teachers and students' parents tends to be lower at outskirt school locations. It is also in line with its vulnerable economic potential based on the type of parents' occupation; (2) Online learning during the Covid-19 pandemic era has taken place in elementary schools, either located in the main, center, or outskirt, with a variety of challenges and different levels of fluency; (3) There are differences in the challenges of implementing online learning in the Covid-19 era, in terms of infrastructure readiness, competence, and governance, either located in the main, center, or outskirt; (4) There is no difference in governance of online learning readiness between schools located in the main, center, or outskirt. All schools tended not to prepare special guidance or directions for online learning, let alone data plan and network help.

Keywords: *Online learning, Digital literacy, Covid-19*

1. INTRODUCTION

The Covid-19 pandemic has changed the system of life, including schools. Millions of school students cannot enter school as they used to be [1]. This pandemic forces school services to be carried out through distance learning, particularly through online learning. E-learning as a medium for education plays an important role and a big function for the education world which has so far been burdened with the many shortcomings and weaknesses of education itself. For example, limited space and time prioritizes efficiency in learning in order to achieve a whole teaching process without the need of physically present. Online learning can be accessed anywhere and anytime according to the assignment given by the teacher, usually scheduled with a specified time limit (Sutiono, Pranoto, Ariyadi, Supriadi, & Iskandar, 2013) [2].

Although the development of ICT-based learning has long been introduced in Indonesia (Cepi, 2019) [3] and internet users have increased significantly [4] before the Covid-19 pandemic, most schools still used conventional methods of teaching. Meanwhile, conventional learning tends not to pay attention to the different needs of students and has limitations in practicing "higher order thinking" [5].

The implementation of distance learning in this pandemic era has a positive value. Online learning is actually a major breakthrough in the digital era and will become a post- pandemic new normal necessity [6].

Online learning is able to ensure the exchange of information and skills (quality of education). It is even

capable of reaching students in difficult locations (access to education) (Hillburg, Jane, &, Gibb, 2003 in Susanto, Himawan Wijanarko, Patricia Susanto, and Suwahjuhadi, 2008)[7]. Digital transformation and internet greatly affect the acquisition of more skills to support work readiness [8].

Research by Bullock (2013) [9] states that being fluent with the use of digital technology can support independent learning to respond the perceived needs of future teachers. In addition, research by Curran et al., 2019 [10] also argues that digital and cellular technology are important resources to support independent learning needs. Individuals who learn through technology require to have not only skills and abilities related to the use of technological tools, but also knowledge on the norms and proper use practices, called digital literacy[11]. With digital technology, individuals will be able to direct themselves to learn, be innovative, and solve various problems [12].

However, remember that digital learning has advantages and disadvantages that need to be anticipated. The advantages are that it is cheaper, has flexible time, based on needs and capabilities, and modern. Meanwhile, the disadvantages are discipline required, plagiarism or massive cheating possibilities, and also isolation of students' social life.

Therefore, many problems were faced when the Covid-19 pandemic occurred: technology infrastructure readiness, human resources, and management systems.

2. LITERATURE REVIEW

2.1 Online Learning and Student Learning Independence

Online learning is a learning method utilizing technology to communicate in two directions over a long distance. Online learning requires internet to support distance learning. Internet and digital technology provide the main infrastructure and communication channels in people's daily lives [8].

The advantages of having the internet are absorbed by all parties, including students in school. Unlimited space and time for information facilitate the easier access to learning resources and independent learning [13].

Another previous research explained that students use the internet for various things, such as to do assignments from school, add new information or insight, and better comprehension of learning material (Levine, 2004) [14]. The internet is also a virtual tutor and study shortcut when students are confused about their assignments. It allows them to collaborate with their peers on projects and group studies Levine, 2004 [14]. The use of this technology for school work is ubiquitous. There are

94% of adolescents indicating that they use the Internet occasionally for school research (Lenhart et al., 2010)[15]. The Internet teaches youths to be responsible consumers, active learners and engaged citizens [16].

Students are very enthusiastic about the internet to support learning. In one study (Li, 2007)[17], students are reported to have enjoyment while using technology for classroom teaching. They expressed positive feelings about the effectiveness of technology in learning. They were motivated and assisted in understanding the learning materials. About 86% of surveyed adolescents indicate that beliefs in internet help them to perform better in school (Rainie & Hitlin, 2005). In fact, 25% of students seem to believe that if children do not learn to access the Internet by the time they start school, they will fall behind their peers [15].

Research by Lenhart et al. [15] shows that the emergence of more sophisticated internet-based applications for collaborative writing and presentations (eg Google Docs, Dropbox, Webspiration) increase students' writing interest. This makes people, especially young people, become more enthusiastic about writing activities. About 78% of young people believe that internet-based applications make it easier for them to write. In addition, 59% of students use computers for better editing and writing process of their school work. 44% of students also gave positive responses to the internet that helps make the learning process more interesting. Students also hope that technology-based learning can foster the enthusiasm of teachers for creative learning.

This online learning shapes students to have independent learning activities. Independent learning within the digital era is also a growing phenomenon with implications to the learning process and the learner attributes[10]; [18]. Bullock's (2013) [9] research shows that being fluent in the use of digital technology can support independent learning to respond to the perceived needs of future teachers. Curran et al. (2019) [10] state that digital and cellular technology is important resources to support independent learning needs. With digital technology, individuals will be able to direct themselves to learn, to be innovative, and to solve various problems[12].

Distance learning process or online learning requires teachers' readiness to prepare efficient learning materials that motivate students to enjoy learning. Research shows that students generally tend to focus on the benefits of using technology for learning; they also often see computer technology as merely enhancement learning tools) [19].

2.2 Digital Discrepancy as a Challenge for Online Learning

The digital discrepancy is a major challenge in the era of internet and popular technology. The digital discrepancy means the existence of gaps between individuals,

households, businesses, (or groups of people) and geographic areas at different socioeconomic levels. The confusion of this discrepancy enables particular parties to use internet services more easily. This gap can be seen from differences in terms of physical access to the use of computers and soft-skills assistance to use the internet as proof of a digital society.

Geographical conditions make the development of ICT infrastructure difficult and expensive. Socio-economic conditions of lower to middle level have not made ICT as an important need [20]. Age or generations can also be a source of digital discrepancy, where parents generally have lower skill levels in accessing information using technology [21]. To conclude, digital discrepancy further affects many areas such as, financial differences (Cho, De Zuniga, Rojas, & Shah, 2003) [22] and gender differences (Kennedy, Wellman, & Klement, 2003) [23], as well as insufficient role of the government and private sector in equal distribution and socialization of ICT [20].

Age, education level, and occupation as discrepancy factors are the basis for technology use in society, especially families and schools. In contrast to the prevailing image of digitally intelligent youth generation, where all young people are frequent and confident users of new technology, numerous studies have shown that they also have very diverse levels of competence in using technology [21]. Nowadays, the ease of digital access is a process of adopting a new lifestyle in the context of internet use within a complex cognitive and social world in society. The ability of individuals to learn technology use is highly shaped by their local social context and is usually triggered by an inherent interest of mastering technology and / or the need to achieve specific goals through technology. It also can be determined by the individual or requested by the school or work context [24].

When all is well, the desire to learn manifests over time through a combination of formal and informal learning experiences, most of which are self-directed (Ferro, Helbig, and Gil-Garcia 2011) [24]. Indeed, a number of scholars have emphasized the importance of informal learning contexts for the development of adolescent digital skills. This informal engagement with technology complements and extends what is offered in formal educational settings (Meyers, & Viglione, 2008). In addition to a supportive network, quality access to technology is very important in supporting digital skills and various internet uses. For young people, high-quality access allows greater autonomy in using technology and the number of online experiences. This has a positive influence on their digital skill level [25].

Therefore, digital skills development has a strong experiential component. Sonia Livingstone and colleagues have demonstrated a central role for experiences by showing how young people took more online activity as they spent more time over the internet [16]. This relationship is found in a various countries and studies [16].

All explanations above will also be in harmony in terms of experience. Information that is developed from life situations and tools promotes a socio-constructivist or socio-cultural approach to be used and utilized properly by the community.

In addition, there is a clear relationship between social position and skills development for using technology. For example, Selwyn & Braunwald's (2005) [27] study on adults found that those coming from high socioeconomic status (SES) tend to use computers for work and had more people they could turn to for help in daily basis. Young people of lower SES are less likely to have high-quality access to technology at home. This leads to a lower level of autonomy in using technology and a lower number of experiences spent online – it negatively affects their digital skill levels (Hargittai, 2003) [21]. Although there is a possible positive and strengthening relationship between the uses and the skills (Hargittai, 2003) [21], in general, those who are more skilled tend to engage in a wider variety of online activities and be capable of participating in a wider range of digital practices.

The discrepancy between students and teachers illustrates the gap between adults and younger ones. Students tend to have higher levels of skill and comfort than their teachers while having digital activities. The digital discrepancy between students and teachers is due to the age difference between the two generations. Millennial generation students tend to have higher skill and comfort levels than their teachers. Li (2007) [17] states that there is a dissonance of opinion between teachers and students about the extent to which technology should be used in schools. Teachers do not fully understand the usability of technology. They think technology is negative because it will increase their workload as a teacher. Meanwhile students expect more use of technology in schools. This may due to teachers' focus on the practical aspects of technology use in terms of feasibility, availability, and added value. On the other side, students emphasize more on the motivational aspects of technology use.

Levine (2004) [14] report shows that students believe that teachers need professional development and technical assistance to effectively integrate technology into their teaching. They further suggest that schools should also teach computer and internet literacy. In reference to these thoughts, it is explained how the use of technology as a whole is needed. As for current learning processes, it is necessary to develop professional and technical assistance for teachers to optimally implement technology in teaching and learning activities.

It can be seen that students can use technology more effectively than their teachers can. Teachers also see that their students are more interested in technology for learning. However, they tend to emphasize more negatively on the use of technology for learning. It is necessary to develop professional skills for teachers to take advantage of technology in classroom learning

accompanied by providing digital-based material. Students prefer considering the use of technology as an educational tool when the situation is very urgent. This does not mean that it replaces a teacher's function completely. Teachers tend to use technology in learning according to the needs of students only. Consequently, some wondered to what extent, if any, the comfort with technology is perceived by teachers in predicting how students evaluate their teachers. Though adolescents' internet literacy rates are often not as high as widely assumed [21].

2.3 Technologic Pedagogical Content Knowledge

Recently, a research was conducted to create a framework for maximizing the use of technology in the teaching and learning process in schools. The aim of this framework, known as Technological Pedagogical Content Knowledge (TPACK) [28], is to comprehend the connections between technology, content, and pedagogical approaches to have an in-depth understanding of how teachers perceive these interactions altogether and further help produce effective discipline-based teaching [29].

Some authors, such as Kay (1979) [30], claim that workshops and courses, intended to increase the pedagogical use of ICT in teacher education, have not had the desired affect. It is more likely seen as the teachers' need for integrating ICT into pedagogical learning to optimize the absorption of material from the teacher to the students within classroom. In relation to this issue, Kirschner, Sweller, & Clark (2006) [31] find that it is important for teacher education programs to focus on digital competencies to avoid loss of time and energy when starting to be teachers in schools. The presence of teachers as role models is also needed during their practicum [32].

3. METHODS

This research was conducted by using a survey method. The respondents of survey were parents, teachers, and elementary school students who were selected purposively by considering the geographical location and the socio-economic background of parents in Bandung. It consists of Central Elementary School (initial B), Middle (initial BH), and Outskirt city (initials H). Data collection was carried out through a questionnaire of google-form. Its distribution was carried out through the WhatsApp groups for parents at school. 643 people were set as respondents in the next analysis from the entered questionnaire data after being verified data filling completion. Data analysis was carried out descriptively with percentage techniques (%) and non-parametric statistical tests of difference for more than two groups. This is because the data obtained were in the form of nominal and ordinal data. The statistical analysis was performed using the Chi-Square technique. Given the difference analysis with a matrix of more than 2x2, the

Chi-Square used is the Pearson technique.

4. RESULTS AND DISCUSSIONS

4.1 Result

4.1.1 Teacher and Parent Profiles by School Location

The farther location of a school, the more teachers have lower levels of education and also lower education level of students' parents along with the economic potential of the work. The data shows that teachers with the same level of education within schools in different locations tend to have consistent differences. This also applies in terms of lower specification to the outskirt schools location. It can be seen in Figure 1 regarding the level of teachers' education in outskirt, center and main city center schools:
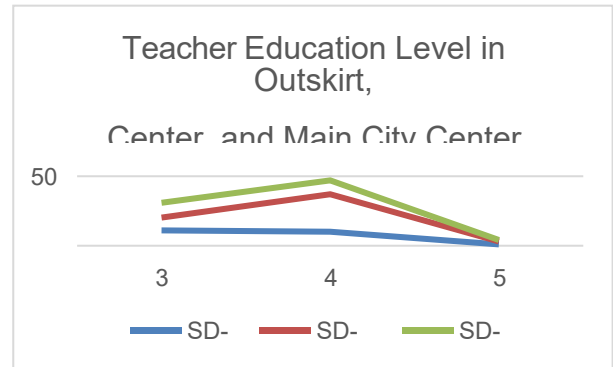

Figure 1. Teacher Education Level in Outskirt, Center and Main City Center Schools

Likewise, Figures 2, 3 & 4 consistently show the same trend in parental education and employment. The farther schools location show lower level of parents' education and the potential economy of family in terms of occupation type. It is described further in the diagram below.
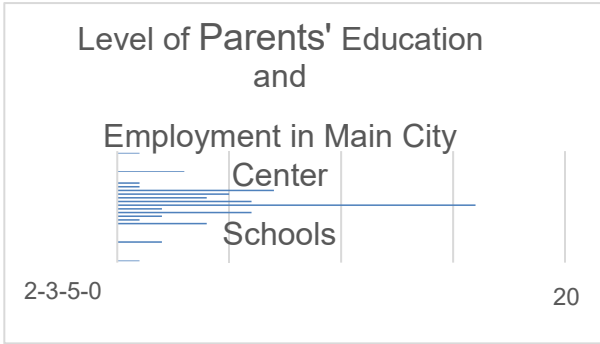
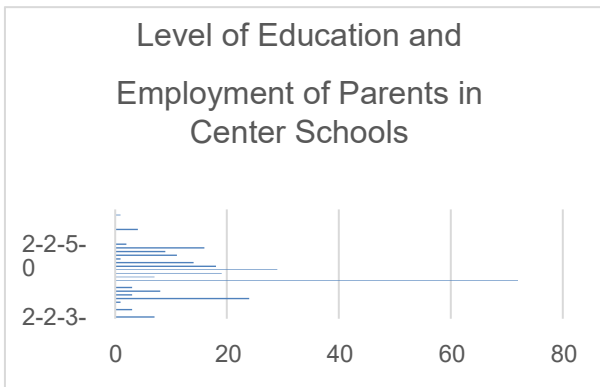Figure 2. Level of Parents' Education and Employment in Main City Center Schools

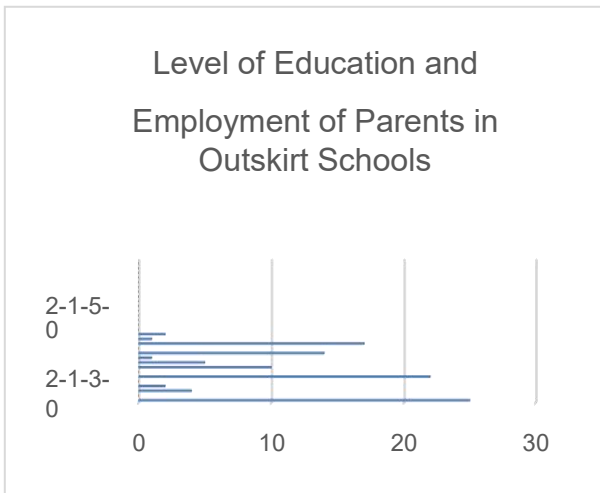Figure 3. Educational Level and Employment of Parents in Center Schools

Figure 4. Education Level and Occupation of Parents in Outskirt School

From the data above, it can be concluded that outskirt school location tends to have lower level of teacher education and low-educated students parents'. It also has vulnerable potential to economic professions.

4.1.2 Infrastructure Challenges Based on School Location

From the data, it can be found that the majority (95.7%) of parents already have had a smart cellphone (Smart Hand Phone) before the Covid-19 pandemic hit. This data can be seen in Figure 5, showing a graph comparing the percentage of cellphone use before the pandemic. Although almost entirely (95%) of them are used as a means of communication, it is not used as a means for children's learning purposes (Table 1). A small proportion (52%) indicates internet subscriptions at home and some others (58%) take advantage of internet by using credit plan.

The data graphic comparison of cellphone percentage use before the pandemic in Figure 5 shows that main center city elementary schools (SD-B) tend to be filled by students with parents from better educational backgrounds and economic potential. They have used cellphones since before the Covid-19 pandemic. In outskirt elementary schools (SD-H), there are more people who have not used cellphones than those who have used them since before the Covid-19 pandemic. Lastly, the center school (SD-BH) conditions show that their percentage is below the main city center and above the outskirt elementary schools.
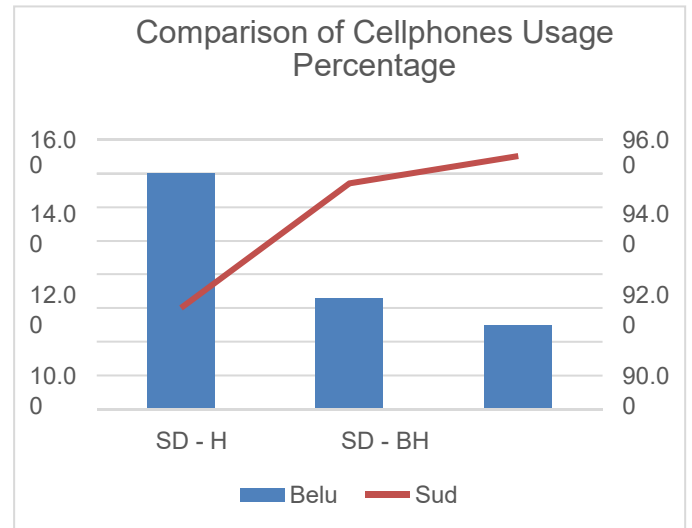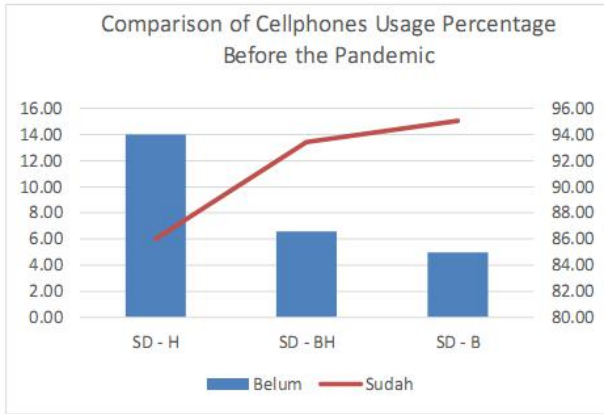
Figure 5. Comparison of Cellphone
Usage Percentage Before the Pandemic.

The usage of cellphones is seen from the respondent's education level. It depicts that more people do not use cellphones at lower level of education, as shown by the data in the following figure.

Figure 6. Cellphone Usage by Education Level

Table 1. Cellphone Usage before the Covid-19 Pandemic Period Based on School Location

Category	fo	fh	fo-fh	(fo-fh)2	(fo-fh)2/fh
1	20	11.34214619	8.65785381	74.9584326	6.61
2	25	30.06065319	-5.06065319	25.61021069	0.85
3	6	9.597200622	-3.59720062	12.93985232	1.35
4	123	131.6578538	-8.65785381	74.9584326	0.57
5	354	348.9393468	5.060653188	25.61021069	0.07
6	115	111.4027994	3.597200622	12.93985232	0.12
				CHI-SQUARE	**9.57**

From the results of statistical tests as shown in table-1, it can be concluded that there are significant differences in the use of cellphones before the Covid-19 Pandemic. The more outskirt of the school location, the less likely is the usage of cellphone.
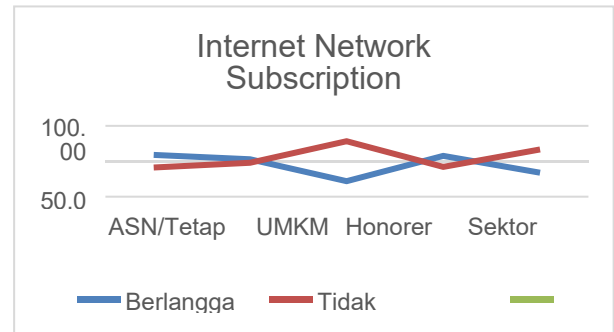

Figure 7. Internet Network Subscription Based on Occupation

The backgrounds of occupations, showing the potential economic capacity of the respondents, portray another finding of less ability of accessing internet network for those in fragile job and economic potential. From the data in Figure 7, it can be seen that parents with jobs that have more vulnerable economic potential, namely those who do not work and are honorary / freelancers, tend not to subscribe the internet.

This indicates that schools in the outskirt tend to use of internet-based intelligent communication facilities more slowly. This is also related to their educational background levels and economic abilities likely lower than those in center and main city center elementary schools. Parents with jobs that have more vulnerable economic potential, namely those who do not work and are honorary / freelancers, tend not to subscribe the internet. There is a tendency for using a variety of learning facilities in center and main center city schools, while those in outskirt schools tend to use cellphones only.

4.1.3 Digital Competency Challenges Based on School Locations

There is a significant difference in the level of fluency usage of computers / laptops between respondents coming from different school location backgrounds. The farther location of school tends to have less proportion of those who are fluent in using a computer / laptop. This can be seen in Figure 8 below.
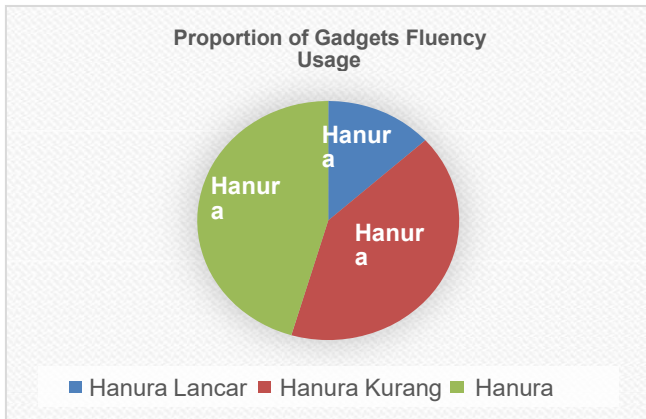
Figure 8. Proportion of Smooth Use of Gadgets

Chi-square number = 147.29 is shown as result of statistical test, it is greater than the chi-square table of 14.86 at a significance level of 0.005 (See the complete data in the following table). Thus, it can be concluded that there is a significant difference in the fluency of gadgets usage between respondents coming from different school locations.

Table 2. Gadgets Usage Fluency by School Location

Category	fo	fh	fo-fh	(fo-fh)2	(fo-fh)2/fh
1	65	35.80559876	29.19440124	852.313064	23.80
2	95	94.89735614	0.102643857	0.010535761	0.00
3	1	30.2970451	-29.2970451	858.3168517	28.33
4	59	56.2659409	2.734059098	7.475079151	0.13
5	168	149.1244168	18.8755832	356.2876413	2.39
6	26	47.6096423	-21.6096423	466.9766404	9.81
7	19	50.92846034	-31.9284603	1019.42658	20.02
8	116	134.9782271	-18.9782271	360.1731024	2.67
9	94	43.0933126	50.9066874	2591.490822	60.14
CHI-SQ					**147.29**

4.1.4 Online Learning Governance Challenges Based on School Locations

Viewed from the aspect of provided guidance, briefing activities, and assistance for online learning during the Covid-19 pandemic, the data shows that there is no significant difference between different school locations. This means that schools in the main center city, center, and outskirt areas tend to be equally sub-optimal in online learning governance during this pandemic. This can be proven by the results of data analysis shown in the following tables.

Table 3. Availability of Online Learning Guide

Category	fo	fh	fo-fh	(fo-fh)2	(fo-fh)2/fh
1	11	12.89891135	-1.89891135	3.605864327	0.28
2	35	34.18662519	0.813374806	0.661578574	0.02
3	12	10.91446345	1.085536547	1.178389596	0.11
4	132	130.1010886	1.898911353	3.605864327	0.03
5	344	344.8133748	-0.81337481	0.661578574	0.00
6	109	110.0855365	-1.08553655	1.178389596	0.01
CHI-SQ					**0.45**

Table 4. Online Learning Briefing Activities

Category	fo	fh	fo-fh	(fo-fh)2	(fo-fh)2/fh
1	14	23.57387247	-9.57387247	91.65903413	3.89
2	68	62.47900467	5.520995334	30.48138948	0.49
3	24	19.94712286	4.052877138	16.4258131	0.82
4	129	119.4261275	9.573872473	91.65903413	0.77
5	311	316.5209953	-5.52099533	30.48138948	0.10
6	97	101.0528771	-4.05287714	16.4258131	0.16
CHI-SQ					**6.23**

Table 5. Availability of credit and network assistance

Category	fo	fh	fo-fh	(fo-fh)2	(fo-fh)2/fh
1	124	125.8755832	-1.8755832	3.517812354	0.03
2	331	333.6143079	-2.61430793	6.834605961	0.02
3	111	106.5101089	4.489891135	20.15912241	0.19
4	0	2.66874028	-2.66874028	7.122174682	2.67
5	8	7.073094868	0.926905132	0.859153124	0.12
6	4	2.258164852	1.741835148	3.033989682	1.34
CHI-SQ					**4.37**

4.2 Discussion

Although the attention of digital discrepancy research has shifted a lot from inequality of access to digital skills and usage, this research focuses on both issues mentioned as the challenges in implementing online learning during the Covid-19 pandemic. This study finds that most of the respondents have already owned and used a cellphone since before the pandemic occurred. Few of them only used it as a learning tool for students. This is in line with several recent studies finding that there is a tendency for people with lower levels of education to use the internet more often and longer than those in middle and moderate level of education. Less educated people appear to be more involved in social interactions and playing games considered to be very time consuming.

Apart from education, age and gender are the most prominent factors of discrepancy in Internet use. Meanwhile, income and residency appear to be less relevant. It is a plausible claim that age difference is partly a temporary phenomenon, not only because younger generations will eventually grow old, but also because they adopt various digital activities such as music, videos, games and social media. The same preference is possible to happen with gender differences as internet activity becomes fairer to all parties. As with age and gender, a certain share of inequality will remain stemming from relatively permanent socio-cultural preferences. It also makes sense that the inequalities associated with different levels of education are more permanent because they are engrained within the fabric of our information or society knowledge. Therefore, a suggestion of discussion over lasting education level differences would be more than age and sex gap.

Hargittai (2004) [25] concluded that those who are already in a more privileged position obtain the benefits of the time they spend online more than users from lower socioeconomic backgrounds. These findings suggest that as internet becomes more mature, its use reflects traditional media usage in society. The internet usage increasingly reflects social, economic, and cultural relations in the real world, including inequality (Mason and Hacker, 2003 [33]; Hargittai, 2004 [25]). For example, people with lower education and lower income tend to spend more time on watching TV, or read less books and newspapers. Such parallels support a comparison between the knowledge discrepancy hypothesis about mass media use and the usage gap hypothesis of internet use (Mason and Hacker, 2003 [33]; Hargittai , 2004) [25]. The educational effect fits the usage gap thesis and the previous assumptions of maintaining knowledge discrepancy.

The resemblance between participation in offline and online worlds are often became a topic of debate on discussions of social inequality. It can be concluded that the digital discrepancy is a temporary problem. Most scholars have moved on from such a conclusion but rather compared the knowledge gap hypothesis with the usage difference hypothesis. It might lead to another misinterpretation, namely education discrepancy always be one of the most factors for differences opportunities in society life and, as such, the Internet is simply another subsequent advances in technology communication that are determined by education. Although there has always been inequality in society, the internet has created a stronger division; members of higher status gain more access to information than members of lower status do. Instead of equity, internet tends to reinforce social inequality and leads to the formation of disadvantaged and marginalized individuals (Golding, 1996) [34]. Wei and Hindman (2011) [35], for example, find that higher socioeconomic status people are more strongly associated with internet information usage than with traditional media. Those differences in Internet use are associated with larger knowledge discrepancy. Therefore, they suggest that the digital discrepancy is more important than its traditional counterpart. After all, the internet has more functions than traditional media.

Theory information and community networks recognize the importance of the Internet as a vital resource in society. In political, social, cultural, health and economic spheres, more information and services are made available online and, often, they are expected to be used by everyone. These findings and other recent studies reveal that in several domains, the current policy direction must be evaluated. There are strong indications that a portion of the population will be excluded from some internet activities. The results of current investigations suggest that overcoming the digital discrepancy is rather complicated

5. CONCLUSION

Based on the results of the research and discussion above, it can be concluded that:

1. The farther schools locations have lower education level teachers and parents. The economic potential based on the parents' occupations is also more fragile.

2. Online learning during the Covid-19 pandemic era has taken place in elementary schools, either for main center city, center or outskirt schools with a variety of challenges and different levels of fluency.

3. There are differences in the challenges of implementing online learning in the Covid-19 pandemic. It is including infrastructure readiness, competence, and governance for main center city, center or outskirt schools

4. There is no difference in online governance readiness between schools located in main center city, center or outskirt schools. All schools tend to not prepare guidance, provide assistance, let alone data plan and networks help.

This article shows, among other, things to which individual motivation and socio-cultural preferences are related. In a free society, such preferences can only be partially changed by particular parties, for example, government, social, and cultural policies within education and community development. Internet-activities related to information, careers and personal development can be made more attractive to a large part of population. Finally, the increase and disperse of positions in education and the labor market (those who actually attending school or adults that has an attractive job) may show the most positive contribution to reducing discrepancy in usage.

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