

Article

Digital Inequality through Digital Skills and Usage: Examining Cultural Outcomes of Internet Use among Employees in Private University

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Abstract: Persistent debate remains in the literature regarding whether digital skills exert a direct influence on internet outcomes or whether this relationship is mediated by the nature and quality of internet usage. This study addresses this theoretical tension by examining digital inequality—conceptualized through digital skills and cultural-internet usage—and its effects on cultural outcomes among university employees in Indonesia. The study has two primary objectives: first, to examine how digital skills and culturally oriented internet use influence the cultural outcomes of internet engagement among employees in a private university setting. Second, to analyse the differences between academic staff (lecturers) and administrative staff in terms of their digital skills, cultural-internet usage, and cultural-internet outcomes. Using a quantitative approach, data were collected from 64 respondents comprising academic and administrative staff at Universitas Pancasila, Indonesia. The findings of the study reveal that digital skills do not have a direct effect on cultural outcomes, suggesting the presence of an intervening variable. Rather, cultural internet use mediates the link, suggesting that digital competency has to convert into culturally focused online activities if major cultural results are to result. These findings underline the need of not only improving digital competencies but also of encouraging significant online participation to solve digital inequality in higher education institutions. The paper presents both theoretical and pragmatic consequences for academic environments' digital inclusion policies.

Keywords: Digital Inequality; digital divide, cultural internet usage; digital skill; cultural outcome

Introduction

Internet use has become essential to professional life in the digital age (Soomro et al., 2020). Technology integration has changed how people communicate, learn, and engage in cultural practices in addition to how they work (Dogruer et al., 2011; Lissitsa, 2015; Shariman et al., 2012). The internet has become a key platform for academic and administrative activities in higher education, especially in private universities throughout Indonesia (Deja et al., 2021; Halim et al., 2024; Nash, 2020). But not everyone has benefited equally from digitization. Digital inequality is still a problem that goes beyond differences in infrastructure access and includes people's ability to use digital tools efficiently, the type of online activity they engage in, and—most importantly—the digital results they obtain from using the internet.

Nowadays, research on digital inequality focuses more on differences in digital skills and usage patterns (the second-level digital divide) (Subramaniam et al., 2023; van Laar et al., 2017) than it did on physical access (the first-level digital divide) (van Deursen & van Dijk, 2019; van Dijk, 2017). Scholarly interest in the

digital consequences of internet use has grown, especially in the cultural sphere, where the third-level digital divide manifests itself (Calderón Gómez, 2021). Because academic and administrative staff must increasingly adjust to digital technologies while preserving culturally appropriate workplace practices and communication methods, this type of digital inequality is especially noticeable in academic settings (Norizuandi et al., 2023). Greater openness to working across gender and ethnic differences, as well as the ability to interact with a variety of religious and spiritual worldviews via digital platforms, are cultural outcomes of internet use in such contexts (Van Deursen et al., 2018). However, there are still few empirical studies that explicitly look at these cultural effects of internet use in higher education settings, particularly in Indonesia, where the relationship between cultural diversity and digital transformation is complicated and poorly understood.

The scant academic focus on the advantages of internet usage in Indonesia can be largely ascribed to the Indonesian government's sluggish response to digital inequality (Halim et al., 2024). The government did not publicly highlight the development of digital literacy as a national objective until the 2020–2024 timeframe (Kurnia, 2020). Conversely, advanced economies commenced prioritizing digital literacy as a pivotal domain of study and policy from 2005 to 2015 (Scheerder et al., 2017; van Deursen & van Dijk, 2014). After this time, researchers in advanced contexts progressively redirected their focus to the tertiary digital divide—specifically, the inequalities in the results individuals achieve from internet usage (Van Deursen et al., 2017).

Although an increasing amount of work has concentrated on the consequences of internet usage, researchers persist in underscoring the significance of second-level digital divide characteristics as critical predictors of these outcomes (Ashley et al., 2017; Bode, 2017; Inan Karagul et al., 2021). In addition to digital skills, internet usage habits have been recognized as significant factors affecting digital outcomes (Van Deursen et al., 2017; van Deursen et al., 2021). This secondary divide is commonly termed digital inequality (Mihelj et al., 2019). Islam et al. (2021) identified that discrepancies in digital literacy and competences, including the proficiency in utilizing computers, mobile devices, and internet technologies, significantly contribute to digital inequality in Bangladesh. Digital competencies are essential, as the internet has evolved from a simple entertainment medium to a comprehensive platform for job progression, professional efficiency, education, and social growth (Büchi et al., 2017; Van Deursen et al., 2018).

The inquiry is whether digital abilities alone suffice to reap the benefits of the internet, or if the domain of application also plays a critical role. Numerous studies assert that domain use serves as a mediator between digital skills and internet outcomes (Helsper, 2012; Van Deursen et al., 2017; van Deursen et al., 2021), indicating that digital skills do not directly affect internet results. Büchi & Vogler (2017) discovered that internet proficiency directly affects internet-related outcomes concerning political engagement. In nations where internet user penetration attains 95%, a robust correlation was identified between digital competencies, the utilization of diverse capital, and resultant outcomes (Van Deursen et al., 2018).

This article examines whether digital skills directly impact cultural outcomes or if their influence is mediated by culturally oriented internet usage patterns. This study intends to analyze the disparities in digital literacy, cultural internet usage, and cultural results between academic staff (lecturers) and administrative personnel. This investigation is especially pertinent in environments like Indonesia, where national policies persist in emphasizing the enhancement of digital competences across many sectors. This study seeks to inform policy initiatives that extend beyond skill training, highlighting the necessity of empowering individuals to obtain significant and transformative advantages from their digital participation.

Literature Review

The concept of digital inequality has progressively shifted toward the domain of digital outcomes, with increasing emphasis on cultural dimensions. In the United Kingdom, Mihelj et al. (2019) found that one of the key offline benefits of cultural internet use lies in the enhancement of individuals' knowledge and appreciation of art, heritage, and history. Virtual tours and other kinds of digitally mediated cultural involvement have also brought users delight. By contrast, Van Deursen et al. (2018) looking at the Dutch setting, noted another set of cultural results. These included more thought on gender disparities, better knowledge of ethnic groups, chances to interact with people with same interests, and closer participation with religious or spiritual beliefs. Scholars have increasingly concentrated on questions of identity development and belonging as primary consequences of internet use outcomes when the cultural sphere is further limited (Helsper, 2012; van Deursen

et al., 2021). This implies that participation in the cultural domain not only increases information but also transforms individual and group identities in ways depending on the context and social relevance.

Internet outcomes have frequently been conceptualized by scholars in terms of the achievements and satisfaction individuals derive from their digital outcomes (Helsper, 2021). In the context of cultural outcomes, van Deursen et al. (2016) found that individuals in the Netherlands and the United Kingdom reported experiencing greater satisfaction than tangible achievements in relation to their cultural internet use. More specifically, feelings of cultural ownership—such as belonging to a cultural community or accessing cultural resources—elicited higher levels of satisfaction than outcomes related to cultural identity, such as self-definition or identity expression. These patterns were further corroborated by Van Deursen et al. (2018), who reported that satisfaction derived from a sense of cultural ownership consistently exceeded that associated with cultural identity among internet users. These findings suggest that cultural internet use tends to yield more affective and experiential benefits than instrumental or identity-based achievements, particularly in Western European contexts.

Still up for scholarly discussion is how people come to get results from internet use. Whether digital abilities by themselves are enough to generate significant results or whether such advantages depend on the quality and type of internet use is central to this discussion (Fauziah et al., 2024). Many studies have found a clear correlation between good digital results and digital competency. Higher degrees of digital skills, for example, make people more likely to find significant advantages from the internet in sectors including job, education, and cultural involvement, according to Büchi et al. (2017). Likewise, Ashley et al. (2017) and Bode (2017) found that digital competency is a major predictor of results including political engagement and informational empowerment. Further data from Van Deursen et al. (2018) supports this perspective within the Dutch setting by showing that whilst social digital skills are more directly linked to happiness with cultural events, creative digital abilities are significantly linked with degrees of cultural achievement.

These results support the argument that, whereas digital skills are fundamental, several characteristics of those skills may generate distinct kinds of effects—either instrumental or affective—in the cultural realm. But the presumption of a straight line from digital abilities to results has been progressively questioned. According to an increasing number of studies, the type and quality of internet usage mediates this link (Van Deursen et al. (2017); Mihelj et al. (2019). For example, Van Deursen et al. (2018) underline how important some kinds of digital talents are inside particular fields in converting digital participation into high-quality results. Likewise, (Heponiemi et al., 2021) state that variations in offline benefits are strongly correlated with both digital competency and domain-specific patterns of use.

Stated differently, even although digital skills are important, they are not enough; results greatly depend on how people use their talents in meaningful and culturally relevant contexts. This tension between the direct-effect model and the mediation model constitutes a central theoretical debate in the field of digital inequality. The present study addresses this debate by empirically testing both pathways: whether digital skills directly influence cultural-internet outcomes, or whether this relationship is mediated by cultural-internet usage (see Figure 1). Based on this framework, the following hypotheses are proposed:

H1: Digital skills positively influence cultural internet usage.

H2a: Digital skills directly influence cultural internet outcomes.

H2b: Cultural-internet usage directly influences cultural-internet outcomes.

H3: Cultural-internet usage mediates the relationship between digital skills and cultural-internet outcomes.

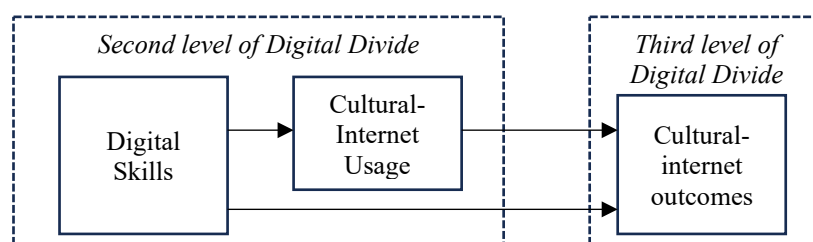


Figure 1. Theoretical Model

Methodology

1. Sample

This study was conducted in May 2023 within the employee community of Universitas Pancasila, located in Jakarta, Indonesia. The total employee population across seven faculties was 525 individuals, comprising 177 administrative staff and 348 academic staff (lecturers). A sample of 84 respondents was determined using a 90% confidence level. This sample size is considered representative of the population based on Glenn sample size table (as cited in Singh & Masuku, 2014). The questionnaire was developed and administered using the online platform SurveyMonkey. A link to the survey was distributed to selected respondents through a stratified random sampling technique, proportionally based on the number of employees in each of the seven faculties: Pharmacy, Law, Economics and Business, Engineering, Communication, Psychology, and Tourism. Although the survey was distributed to 84 selected participants, only 65 complete responses were received within the designated data collection period and deemed suitable for analysis. This limitation may affect the degree to which the sample fully reflects the characteristics of the broader population under study.

2. Measures

Digital Skills (Independent Variable)

This study takes the definition of digital skills presented by the Ministry of Communication and Information team of the Republic of Indonesia in a book *Status Literasi Digital di Indonesia 2022*. Digital skill is “ability to know, understand, and use ICT hardware and software as well as digital operating system in everyday life” (Ameliah et al., 2022). We measured digital skills with 9 indicators. Example items include “Download file/application”, “Save the data, information, and content on the digital media” and “Used to compare various sources of information to decide whether the information is correct.” All items were rated on a 5-point scale ranging: 1 (do not understand), 2 (never do), 3 (do with the help of others), 4 (do it yourself), and 5 (do it yourself and can help others). The Cronbach’ alpha value is .92. For a full list of all items, see Tabel 1.

Table 1. Indicators for Digital Skills

I know how to ($\alpha = .92$) (M=4.19)	M	SD
Download file/application	4.35	.799
Connecting devices to the internet	4.38	.700
Upload file	4.52	.615
Search and access to data, information, and content on digital media	4.18	.864
Save the data, information, and content on the digital media	4.15	.905
Communicate with others by smart devices	4.13	.704
Use the smart device for e-shopping/ecommerce	4.00	.951
Used to compare various sources of information to decide whether the information is correct	4.09	.896
Find out if the information I found on website is true or false	3.98	.856

Cultural-Internet Usage (Independent Variable)

We define cultural-internet usage as an individual’s online engagement in cultural domain. This concept was measured with 12 indicators consisting of gender, ethnicity, and religion. Example items include ‘Find the information about differences live style between men and women’ (gender), ‘Find/read information about other ethnics’ (ethnic), and ‘Seeking knowledge of the roles in the teaching of the religion they adhere to’ (religious). All items were rated on a 5-poin Likert-type scale ranging from 1 (never) to 5 (very often). The Cronbach’ alpha value is .82. and exhibited high internal consistency (Tabel 2).

Table 2. Indicators for cultural-internet usage (mediate variable)

I engage to ($\alpha = .82$) (M=2.32)	M	SD
Find the information about differences live style between men and women	1.81	.663
Search the information about differences behavior between men and women	1.67	.640
Search the information/ knowledge about differences attitude between men and women	1.86	.726
Interact with people who share the ethnicity subject	2.38	1.02
Watch the movie/ documentary about our ethnicity	2.04	.799
Find/read information about other ethnics	2.32	.903
Discuss about ethnic differences	2.04	.799
Find information about how to worship according to religion	2.73	1.22
Read holy book online	2.44	1.11
Watch/Listen to religious lectures from YouTube	2.90	.979
Seeking knowledge of the essence of religion	2.73	1.03
Seeking knowledge of the roles in the teaching of religion they adhere to	3.03	1.08

Cultural Outcomes (Dependent Variable)

“Cultural Outcomes” is the benefits obtained by internet users from their use related to cultural resources including gender, ethnicity, and religion. This concept was measured with 11 indicators. Example items for cultural outcomes were measured by asking ‘The things I came on the internet made me think about differences between men and women’ (gender), ‘Through the internet I learned new things about ethnic group’ (ethnic), and ‘Due to the religious knowledge that I found made my worship increased’ (religious). All items were rated on a 5-poin Likert-type scale ranging from 1 (completely disagree) to 5 (completely agree), with higher scores reflecting higher outcomes. The Cronbach’ alpha value is .92 (see Tabel 3).

Table 3. Indicators for cultural-internet outcome

I agree with that ($\alpha = .92$) (M= 3.28)	M	SD
The things I came on the internet made me think about differences between men and women	3.27	.910
The information I found on the internet made me easy to interact with co-workers of a different gender	3.27	.739
The information I found on the internet made me easy to work with a friend of a different gender	3.30	.748
The information I found from internet made me understand the behavior of co-workers of different gender	3.17	.702
Through the internet I learned new things about ethnic group	3.50	.755
Through the internet made me easy to interact with co-worker of a different ethnic	3.31	.709
Through the internet made me easy to work with a friend of a different ethnic	3.29	.705
Through the internet made me understand the behavior of co-workers of different ethnic	3.26	.695
Due to the religious knowledge that I found made my worship increased	3.34	1.11
Due to the religious knowledge that I found made me excited to work	3.31	1.08
Due to the religious knowledge that I found made me behave the same with colleagues of different religions	3.15	.963

The Findings

1. Descriptive Analysis

This research was conducted within an educational institutional context. As presented in Table 1, the demographic distribution of respondents indicates a higher proportion of male participants compared to female. Many respondents fell within the 31–45 age group, suggesting a predominantly mid-career professional cohort. In terms of educational attainment, most participants held a master’s degree, reflecting the academic qualifications typical of higher education personnel. Furthermore, the sample was largely composed of lecturers, highlighting the academic nature of the respondent group within the university setting.

Table 4. Demographic (N=65)

	N	%
Gender	37	56.9
Male	28	43.1
Female		
Age (years)		
23-30	9	13.8
31-45	31	47.7
46-60	23	35.4
60+	2	3.1
Education		
Junior/Senior High School	4	6.2
Bachelor	24	36.9
Magister	26	40
Doctoral	11	16.9
Status		
Lecturer	36	55.4
Staff Administration	29	44.6

Table 5 presents data on respondents' internet experience and participation in digital literacy workshops. The findings indicate that many respondents reported having high levels of internet access, with only 1.5% indicating limited access. Additionally, a notable proportion of respondents—29.2%—had not participated in any form of digital literacy training. This suggests that despite widespread access to the internet, a significant gap remains in terms of formal exposure to structured digital literacy development.

Table 5. Internet Experiences

Access to Internet (a day)	N	%
< 1 hour	1	1.5
1-2 hours	7	10.8
Hour	11	16.9
4-6 hours	14	21.5
>6 hours	32	49.2
<i>Trainer or Workshop of Digital Literacy</i>		
Never	19	29.2
1 time	22	33.8
2-3	17	26.2
More 3 times	7	10.8

This study also explored the types of technology utilized by respondents in their professional activities. As shown in Table 7, laptops emerged as the most frequently used device among participants, surpassing other forms of technology. This trend is likely attributable to the composition of the respondent group, which includes a substantial number of lecturers. Within the Universitas Pancasila context, administrative staff are typically provided with desktop computers by the institution, whereas lecturers commonly rely on their personally owned laptops for academic and instructional purposes. This division reflects the differing technological needs and institutional support structures between academic and administrative roles.

Table 6. Device for working

	M	SD
Smartphone	2.98	.799
Laptop	3.15	.865
Tablet	1.65	.928
Computer/PC	2.67	1.23

2. Data Analysis

This study uses path analysis and t-test approaches. Path analysis was used to test whether there is a direct relationship between digital skills and cultural outcomes, or whether the relationship is mediated by cultural use. Since the analytical tool used was SPSS, multiple regression was used to test each relationship model.

Then t-test analysis was used to test for differences among employees. Table 7 shows the results of the path analysis. Analysis of the influence of digital skills (DS) on cultural-internet usage (CIU) obtained significant results of $0.001 < 0.05$. So, it can be concluded that there is a direct influence of digital skills on cultural-internet usage (H1-supported). The results of other analyses have been tested, digital skills on cultural-internet outcomes (CIO) obtained significant results of $0.199 > 0.05$ and cultural-internet usage on cultural-internet outcomes of $0.001 < 0.05$. These results can be concluded that digital skills do not directly influence cultural-internet outcomes (H2a-Not Supported), while cultural-internet usage influences cultural-internet outcomes (H2b-Supported).

Table 7. Path Analysis

Factors	β	p value	E
Digital Skills to Cultural-internet usage	0.407	0.001	0.913
Digital Skills to Cultural-internet outcomes	-0.153	0.199	-
Cultural-internet usage to Cultural-internet outcomes	0.610	0.001	-
Digital skills related to Cultural-internet usage to cultural-internet outcomes	0.248	0.001	0.826

It is known that there is no direct influence that digital skills have on cultural-internet outcomes ($\beta = -0.153$ $p > 0.05$). Meanwhile, the indirect influence of digital skills through cultural-internet usage on cultural-internet outcomes is the multiplication of the DS beta value on CIU ($\beta: 0.407$) with the CIU beta value on the CIO beta value ($\beta: 0.610$), namely: $0.407 \times 0.610 = 0.248$. So, the total influence that DS has on the CIO is the direct influence plus the indirect influence, namely $\beta: -0.153 + 0.248 = 0.095$. Based on the results of these calculations, it is known that the direct influence value is -0.153 and the indirect influence is $.248$, which means that the indirect influence value is greater than the direct influence value. These results also address the study's first objective, confirming that the effect of digital literacy on cultural outcomes is mediated by cultural-internet usage. Accordingly, Hypothesis 3 is supported. this study establishes a model of cultural outcomes as illustrated in Figure 2.

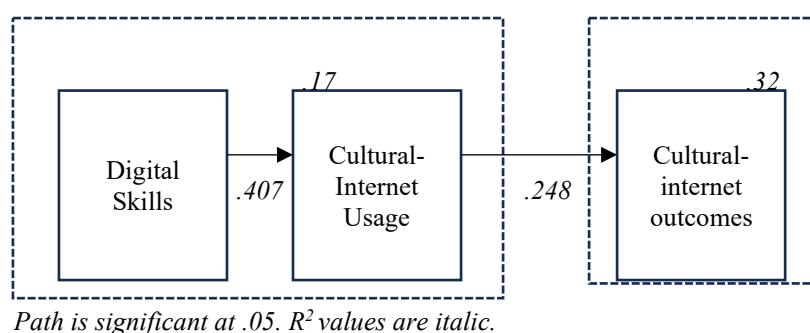


Figure 2. Cultural Outcome Model

The second research objective was addressed through an independent-samples t-test analysis (Table 8). For the digital skills was no significant difference in scores for lecturer and administration staff ($t(63) = 1.86$, $p = .73$, two-tailed). The cultural-internet usage was significantly different in score for lecturer and administration staff ($t(62) = 3.40$, $p = .02$, two-tailed). Meanwhile, the cultural-internet outcome also was significantly different in score for lecturer and administration staff ($t(62) = .904$, $p = .04$, two-tailed).

The results of this analysis indicate that a gap persists between lecturers and administrative staff in terms of cultural-internet usage and cultural outcomes. Lecturers reported significantly higher levels of engagement in culturally oriented internet use and experienced more substantial cultural outcomes compared to their administrative counterparts.

Table 8. T-test between Employee Status (ES)

Factors	Mean		<i>t</i>	<i>df</i>	<i>p value</i>
	Lecturer	Staff			
Digital Skills	4.33	4.03	1.86	63	0.731
Cultural-internet usage	2.53	2.08	3.40	62	0.020
Cultural-internet outcome	3.36	3.21	.90	62	0.040

Discussion

This research adds to the continuous discussion on the link between internet results and digital literacy. Within the cultural sphere, the results confirm those of (Mihelj et al., 2019; Van Deursen et al., 2017), therefore verifying that internet usage moderates the correlation between digital literacy and the results of digital interaction. Although cultural results are much improved by culturally focused internet use, the degree of such usage is itself affected by the individual's degree of digital competency. Thus, digital skills remain a major determinant of the benefits individuals can derive from their online encounters (Van Deursen & Helsper, 2018).

Universitas Pancasila seems to have closed the digital literacy gap mostly. Digital inequality still exists, though, in the spheres of cultural-internet consumption and cultural outputs. Reduced access to cultural benefits among users—especially administrative staff—is linked to lower degrees of culturally oriented online involvement. Differences in educational background help to explain this discrepancy in some extent: Comparatively to academic staff, 96% of administrative staff have lesser degrees. People with a secondary-level education report notably lower degrees of cultural satisfaction, according to (Van Deursen & Helsper, 2018). This result is strengthened even more by (Helsper & Van Deursen, 2015), who also underline how education shapes digital results. The different nature of job tasks also provides another clarifying element. Usually working eight hours a day, with only a one-hour break, administrative staff members are mostly engaged in regular chores completed on desktop computers.

While professors have similar working hours, they usually have more autonomy and freedom in how they allocate their time, which increases chances to use the internet for purposes unrelated to their jobs. This adaptability could let academic staff access a wider spectrum of culturally enhancing digital activities, hence increasing the cultural-internet usage and results. Especially among respondents, this study revealed that internet use for religious activities was rather notable; learning about ethnic variety came up as the most often mentioned cultural accomplishment. On the other hand, in their research done in the Netherlands, Van Deursen & Helsper (2018) noted a somewhat distinct pattern of participation whereby visiting adult websites including sexual content was among the more prevalent behaviours. In the Dutch setting, one of the most often mentioned cultural result was the capacity to interact with peers of like age who had shared interests.

Conclusion

This study finds that although university staff members have rather expanded their digital skills, there are still notable differences in cultural-internet use and outcomes—especially between professors and administrative workers. Digital skills mediate their impact through culturally oriented internet use; they do not directly affect cultural results. These results suggest that institutions should not only support deliberate and culturally relevant internet involvement but also invest in improving digital skills. To improve the generalizability of the results, future research should consider broadening the scope of analysis to include several private and public universities spread throughout several geographical areas of Indonesia. Furthermore, a mixed-methods approach including qualitative interviews could offer closer understanding of the reasons, difficulties, and cultural interpretations underlying people's digital participation.

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Conflicts of Interest: This research is no conflict of interest.

References

- Ashley, S., Maksl, A., & Craft, S. (2017). News Media Literacy and Political Engagement: What's the Connection? *Journal of Media Literacy Education*, 9(1), 79-98. <https://doi.org/10.23860/JMLE-2017-9-1-6>
- Bode, L. (2017). Gateway Political Behaviours: The Frequency and Consequences of Low-Cost Political Engagement on Social Media. *Social Media and Society*, 3(4). <https://doi.org/10.1177/2056305117743349>
- Büchi, M., & Vogler, F. (2017). Testing a Digital Inequality Model for Online Political Participation. *Socius: Sociological Research for a Dynamic World*, 3, 237802311773390. <https://doi.org/10.1177/2378023117733903>
- Calderón Gómez, D. (2021). The third digital divide and Bourdieu: Bidirectional conversion of economic, cultural, and social capital to (and from) digital capital among young people in Madrid. *New Media and Society*, 23(9), 2534–2553. <https://doi.org/10.1177/1461444820933252>
- Deja, M., Rak, D., & Bell, B. (2021). Digital transformation readiness: perspectives on academia and library outcomes in information literacy. *Journal of Academic Librarianship*, 47(5). <https://doi.org/10.1016/j.acalib.2021.102403>
- Dogruer, N., Eyyam, R., & Menevis, I. (2011). The use of the internet for educational purposes. *Procedia - Social and Behavioral Sciences*, 28, 606–611. <https://doi.org/10.1016/j.sbspro.2011.11.115>
- Fauziah, Ibrahim; Siti Noradilah, Zainal; Ezarina, Zakaria; Wan Shahrazad, Wan Sulaiman; Mohammad Rahim, Kamaluddin; Sheerad, S. (2024). Penggunaan Media Sosial, Kemahiran Komunikasi dan Penggunaan Teknologi Maklumat dalam Memperkasakan Keusahawanan Bekas Banduan di Malaysia. *E-Bangi: Journal of Social Sciences & Humanities*, 21(4), 1–15. <https://doi.org/10.17576/ebangi.2024.2104.01>
- Halim, U., Febrina, D., Agustina, A., Hidayat, N., & Ningsih, W. (2024). Digital Inequality: E-learning Outcomes among Youth in Indonesia. *JTUS*, 02(1). <https://doi.org/10.58631/jtus.v2i1>
- Halim, U., Hidayat, N., Rosit, M., Suri, I., & Handoko, D. (2024). *Digital Opportunities and Internet Outcomes on Educational Domain: A Comparison between Urban and Rural of Indonesian University Students*. 22, 20248–20257. <https://doi.org/10.57239/PJLSS-2024-22.2.001484>
- Helsper, E. J. (2012). A Corresponding Fields Model for the Links Between Social and Digital Exclusion. *Communication Theory*, 22(4), 403–426. <https://doi.org/10.1111/j.1468-2885.2012.01416.x>
- Helsper, E. J., & Van Deursen, A. J. A. M. (2015). *Tangible Outcomes of Internet Use*. <https://doi.org/10.13140/RG.2.1.1117.6722>
- Heponiemi, T., Gluschkoff, K., Leemann, L., Manderbacka, K., Aalto, A. M., & Hyppönen, H. (2021). Digital inequality in Finland: Access, skills and attitudes as social impact mediators. *New Media and Society*. <https://doi.org/10.1177/14614448211023007>
- Inan Karagul, B., Seker, M., & Aykut, C. (2021). Investigating Students' Digital Literacy Levels during Online Education Due to COVID-19 Pandemic. *Sustainability*, 13(21), 11878. <https://doi.org/10.3390/su132111878>
- Islam, M. N., & Inan, T. T. (2021). Exploring the Fundamental Factors of Digital Inequality in Bangladesh. *SAGE Open*, 11(2). <https://doi.org/10.1177/21582440211021407>
- Kurnia, N. (2020). *Whatsapp Group and Digital Literacy among Indonesian Women*.
- Lissitsa, S. (2015). *Patterns of digital uses among Israeli Arabs – between citizenship in modern society and traditional cultural roots*. 25(5), 447–464.
- Mihelj, S., Leguina, A., & Downey, J. (2019). Culture is digital: Cultural participation, diversity and the digital divide. *New Media and Society*, 21(7), 1465–1485. <https://doi.org/10.1177/1461444818822816>
- Nash, C. (2020). Report on Digital Literacy in Academic Meetings during the 2020 COVID-19 Lockdown. *Challenges*, 1–24. <https://doi.org/10.3390/challe11020020>
- Norizuandi, Ibrahim; Azlina, Bujang; Zainon, Hj Bibi; Sarehan, Sadikin; Noriham, B. H., & Ambi. (2023). The Impact of ICT in Empowering Sarawak Women in Home-Based Business Communities. *E-*

- Bangi: Journal of Social Sciences & Humanities*, VIII(I), 1–19. <https://doi.org/http://dx.doi.org/10.17576/ebangi.2023.2004.33>
- Scheerder, A., van Deursen, A., & van Dijk, J. (2017). Determinants of Internet skills, uses and outcomes. A systematic review of the second- and third-level digital divide. In *Telematics and Informatics* (Vol. 34, Issue 8, pp. 1607–1624). Elsevier Ltd. <https://doi.org/10.1016/j.tele.2017.07.007>
- Shariman, T. P. N. T., Razak, N. A., & Noor, N. F. Mohd. (2012). Digital Literacy Competence for Academic Needs: An Analysis of Malaysian Students in Three Universities. *Procedia - Social and Behavioral Sciences*, 69, 1489–1496. <https://doi.org/10.1016/j.sbspro.2012.12.090>
- Singh, A. S., & Masuku, M. B. (2014). SAMPLING TECHNIQUES & DETERMINATION OF SAMPLE SIZE IN APPLIED STATISTICS RESEARCH: AN OVERVIEW. *International Journal of Economics, Commerce and Management*, II(11), 1–22.
- Soomro, K. A., Kale, U., Curtis, R., Akcaoglu, M., & Bernstein, M. (2020). Digital divide among higher education faculty. *International Journal of Education Technology in Higher Education*, 17(21), 1–16.
- Subramaniam, L., Jalaludin, F. W., Hen, K. W., & Yap, C. S. (2023). The second and third levels of digital divide among Malaysian university students during the Covid-19 pandemic. *Telkomnika (Telecommunication Computing Electronics and Control)*, 21(6), 1326–1333. <https://doi.org/10.12928/TELKOMNIKA.V21I6.25258>
- Van Deursen, A. J. A. M., & Helsper, E. J. (2018). Collateral benefits of Internet use: Explaining the diverse outcomes of engaging with the Internet. *New Media and Society*, 20(7), 2333–2351. <https://doi.org/10.1177/1461444817715282>
- van Deursen, A. J. A. M., Helsper, E. J., & Eynon, R. (2016). Development and validation of the Internet Skills Scale (ISS). *Information Communication and Society*, 19(6), 804–823. <https://doi.org/10.1080/1369118X.2015.1078834>
- Van Deursen, A. J. A. M., Helsper, E. J., & Van Dijk, J. A. G. M. (2017). *The Compoundness and Sequentiality of Digital Inequality*.
- van Deursen, A. J. A. M., van der Zeeuw, A., de Boer, P., Jansen, G., & van Rompay, T. (2021). Digital inequalities in the Internet of Things: differences in attitudes, material access, skills, and usage. *Information Communication and Society*, 24(2). <https://doi.org/10.1080/1369118X.2019.1646777>
- van Deursen, A. J. A. M., & van Dijk, J. A. G. M. (2014). The digital divide shifts to differences in usage. *New Media and Society*, 16(3), 507–526. <https://doi.org/10.1177/1461444813487959>
- van Deursen, A. J. A. M., & van Dijk, J. A. G. M. (2019). The first-level digital divide shifts from inequalities in physical access to inequalities in material access. *New Media and Society*, 21(2), 354–375. <https://doi.org/10.1177/1461444818797082>
- van Deursen, A. J., & van Dijk, J. A. (2021). IQ and digital inequality: An empirical investigation. *New Media & Society*, 146144482110240. <https://doi.org/10.1177/14614448211024012>
- van Dijk, J. A. G. M. (2017). Digital Divide: Impact of Access. In *The International Encyclopedia of Media Effects* (pp. 1–11). Wiley. <https://doi.org/10.1002/9781118783764.wbieme0043>
- van Laar, E., van Deursen, A. J. A. M., van Dijk, J. A. G. M., & de Haan, J. (2017). The relation between 21st-century skills and digital skills: A systematic literature review. *Computers in Human Behavior*, 72, 577–588. <https://doi.org/10.1016/j.chb.2017.03.010>