

DIGITAL CITIZENSHIP SKILLS SURVEY IN HIGH SCHOOL

Nisrina Nurul Insani^{1a*}, Aim Abdul Karim^{2b}, Kokom Komalasari^{3c}, Rahmat^{4d}

^{1,2,3,4} Universitas Pendidikan Indonesia, Bandung, Indonesia

^a nisrina.n.i@upi.edu

^b aimabdulkarim@upi.edu

^c kokom@upi.edu

^d rahmat@upi.edu

(*) Corresponding Author

nisrina.n.i@upi.edu

ARTICLE HISTORY

Received : 01-10-2025

Revised : 18-10-2025

Accepted : 07-11-2025

KEYWORDS

Skills;
Citizenship;
Digital;
High School Students;
Pancasila Education.

ABSTRACT

This research is motivated by the need to understand the digital citizenship skills of high school students as part of strengthening *Global Citizenship Education* and integrating the Pancasila Education curriculum. The purpose of the research is to measure students' digital citizenship skills, identify strengths and weaknesses in each dimension, and provide recommendations for curriculum development. The method used was a quantitative survey with 896 respondents from public high schools in the city of Bandung. The instrument in the form of a Likert scale questionnaire covers four dimensions: *Digital Access*, *Digital Communication*, *Digital Etiquette*, and *Digital Rights & Responsibilities*. The results showed that students' skills were in the medium to high category, with strengths in the aspects of digital security and polite communication, while weaknesses were seen in the creativity of positive content and the ability to explain ideas clearly. These findings underscore the importance of learning that emphasizes not only technical literacy, but also critical communication, empathy, and productive contributions in the digital space. As a result, the results of this study provide an empirical basis for schools and policymakers in strengthening the Pancasila Education curriculum based on *deep learning*. The next recommendation is the need for longitudinal research and curriculum interventions to optimize the role of students as critical, ethical, and participatory digital citizens.

This is an open access article under the CC-BY-SA License.



INTRODUCTION

The global phenomenon shows that although international policies emphasize the importance of digital citizenship education as a pillar of *Global Citizenship Education* (GCED), practices in high schools still face a serious gap, namely the learning process that has not been able to facilitate these skills optimally. emphasized that the digital era brings great opportunities for citizen participation in digital citizenship skills, especially through information literacy, inclusive communication, and active involvement in online public spaces. However, this opportunity also comes with serious challenges such as disinformation, hate speech, and widening inequality of access. The GEM report highlights that education should ideally ensure learning systems are adaptive to digital transformation, but the reality shows that many institutions have not yet prepared curricula and teachers for such integration. The 2025 World Youth Survey shows that 44% of respondents have a high interest in digital citizenship skills, but have never received formal training. In the Asia-Pacific region, it was also noted that the digital competencies of teachers and students often do not translate into sustainable learning practices. This phenomenon shows that there is a mismatch between global policy direction, the readiness of educational institutions, and the learning practices experienced by students.

Without systematic mapping, digital citizenship skills have the potential to be positioned only as policy jargon, without real implementation in the classroom learning process. Thus, the measurement of digital citizenship skills at the high school level is not just an evaluation instrument, but a key strategy to reconstruct curricula and teaching materials to be in line with global norms and relevant to students' social realities. (UNESCO, 2024a) (UNESCO, 2024a) (UNESCO-UNEVOC, 2025) (UNESCO, 2023) (Tapias et al., 2024)

Currently, there are many theories and frameworks that explain digital citizenship. This concept is understood as a combination of ethics, media literacy, participation, and critical attitudes. Frameworks like DigComp 2.2 provide guidance on citizens' digital skills, from data literacy, collaboration, to security. For teachers, DigCompEdu helps develop specific competencies to support digital learning, and Ribble's (2011) nine-element model is still used in schools to emphasize responsible digital behavior. Even so, there is still little research that tests how these measurement instruments are actually used in high schools, especially high schools. Therefore, what needs to be further researched is how digital citizenship assessments can be integrated into the high school curriculum so that it not only measures abilities, but also strengthens students' (Choi, 2016) (Vuorikari et al., 2022) (Redecker & Squirrel, 2017) (Dass & Kumar M.P.M., 2024) *global citizenship*. (Fernández-Prados et al., 2021)

Literature review confirms that digital citizenship skills are a multidimensional concept that includes technical skills, ethics of use, and political participation. International instruments such as *the Digital Citizenship Scale* have been revised to be relevant across countries with four key factors, including online political engagement. Another study emphasized the importance of the socio-citizenship dimension through DIGISOC which measures digital skills as well as social engagement. In addition, an assessment framework with 35 indicators has been developed to assess the capacity, inclusion, and impact of digital participation, although its application in secondary schools is still limited. Meanwhile, comparative studies show the need for a more uniform definition to avoid bias in digital citizenship measurements. At the national level, research in Indonesia found that digital citizenship literacy is related to privacy awareness, but student participation in the digital space is still weak (Iskandar et al., 2025). Survey data also shows that demographic factors, attitudes, and self-efficacy also affect the level of digital citizenship readiness of students. It is still unclear how the global instrument can be adapted to the context of high schools in Indonesia, the most relevant indicators used, and the effectiveness of measurement in supporting learning. Therefore, it is necessary to understand the use of valid and reliable instruments, the influence of internal and external factors on students' digital skills, and the use of measurement results to strengthen the Pancasila Education curriculum. (Connolly & Miller, 2022) (Peart et al., 2020) (Zhang et al., 2024) (Fernández-Prados et al., 2021) (Prasetyo, Naidu, Tan, et al., 2021) (Prasetyo, Naidu, Sari, et al., 2021)

Research on measuring digital citizenship skills in high school is critical because it touches on three main domains: academic, policy, and social practice. Academically, this research enriches the discourse of civic education by adding a digital dimension that has not been widely measured systematically. In terms of policy, this is in line with the direction of national education transformation through Deep Learning (PM) which emphasizes aware, meaningful, and encouraging learning as well as the integration of digital literacy in the curriculum to realize the Pancasila Student Profile. Socially, this research is relevant to the needs of the younger generation in facing the challenges of the digital era, the 2035 demographic bonus, and the vision of a Golden Indonesia 2045, so that they are ready to become critical, ethical, and participatory global citizens. This research also supports the (Choi, 2016) (Ministry of Primary and Secondary Education of the Republic of Indonesia, 2025) *Sustainable Development Goals* (SDGs) agenda, specifically goal 4 on quality education and goal 16 on peace, justice, and strong institutions. Its original contribution was to present an assessment instrument that could be integrated into the high school curriculum, providing new empirical evidence, while offering an alternative model to strengthen (UNESCO, 2024b) *global citizenship* in the digital age. (Ananto & Nürnü, 2023)

This research aims to develop an instrument to measure the digital citizenship skills of high school students and see its relevance in strengthening *global citizenship*. This instrument is expected to be integrated into the Pancasila Education curriculum based on Deep Learning so as to support the achievement of SDG 4 on quality education and SDG 16 on peace, justice, and strong institutions. The implications of this research are not only on the development of theories and academic studies, but also provide an empirical basis for national education policies, especially the direction of curriculum transformation that emphasizes meaningful, aware, and adaptive learning to digital literacy. In addition, this research is expected to produce learning practices that prepare students to become critical, ethical, and participatory digital citizens. The research questions asked were: (UNESCO, 2024b) (Ministry of Primary and Secondary Education of the Republic of Indonesia, 2025)

1. How can high school students' digital citizenship skills be measured validly and reliably?
2. How can the measurement results be integrated into the curriculum to strengthen Pancasila Education in

schools?

Literature Review

Digital Citizenship Assessment

Digital citizenship skills are seen as important because it is not only about being able to use technology, but also about how students can play an active and responsible role in the digital space. The latest measurement instrument shows that the focus has now shifted from just technical literacy to broader assessment, including social and political aspects. For example, the revised Digital Citizenship Scale adds a dimension of online political engagement to suit cross-border needs. The DIGISOC instrument also expands the scope by assessing social participation in the digital world. Other assessment frameworks even formulated 35 indicators that emphasize the capacity, inclusion, and social impact of digital participation, although their implementation in secondary schools is still rare. (Connolly & Miller, 2022) (Peart et al., 2020) (Zhang et al., 2024)

However, there are still challenges in this assessment. Comparative research shows that differences in definitions and indicators can create bias when used in different countries, so the instrument needs to be adapted to the local context. Other studies highlight that many instruments are still self-assessment-based, so they do not necessarily reflect students' real practices. There are also studies that show that when an instrument is tested in a country, new factors emerge that are appropriate to the local culture, as happened in Chile (Galván-Cabello et al., 2025). This proves that digital citizenship assessments continue to evolve globally, but the biggest challenge is how to create a valid, relevant, and well-applicable instrument at the secondary school level. (Fernández-Prados et al., 2021) (Dass & Kumar M.P.M, 2024)

Digital Citizenship in the High School Curriculum

Theoretically, digital citizenship skills in Indonesia need to be understood within the framework of integration between global theory and local contexts. The nine-element model of digital citizenship developed by Ribble (2011) emphasizes aspects of ethics, communication, rights, and responsibility. Meanwhile, the DigComp 2.2 framework adds dimensions of data literacy, collaborative communication, digital security, and content creation. In the context of education, DigCompEdu places teachers as facilitators of students' digital skills. These theories provide a conceptual basis for understanding how digital skills are not just technical abilities, but also involve ethical and participatory aspects that are important for secondary education. (Vuorikari et al., 2022) (Redecker & Squirrel, 2017)

The framework is then aligned with national policies. Deep Learning (PM) emphasizes meaningful, critical, and adaptive learning by including digital literacy as a core competency. However, the results of the survey in Indonesia show that there is a gap between theory and practice. Students' digital literacy has been shown to be related to privacy awareness, but it has not been enough to encourage active engagement in digital public spaces. In addition, demographic, attitude, and self-efficacy factors also affect digital skill achievement. The (Ministry of Primary and Secondary Education of the Republic of Indonesia, 2025) (Iskandar et al., 2025) (Prasetyo, Naidu, Tan, et al., 2021) *scoping review study* confirms that the assessment instruments used in schools are still dominant in the technical aspect, while ethical and participatory indicators are less considered. Thus, this theoretical framework shows the need for a new assessment instrument that is able to integrate global theory with the local context, so that the measurement results can really strengthen the Pancasila Education curriculum. (Dass & Kumar M.P.M, 2024)

METHOD

This study uses a quantitative approach with a survey method to obtain an empirical picture of the digital citizenship skills of high school students in the city of Bandung. The survey method was chosen because it is able to provide objective numerical data, as well as allow statistical analysis that can be used to assess the validity and reliability of the instrument. Surveys as a research method have been widely used in the social sciences due to their ease in collecting data from large populations, especially with standard instruments such as the Likert scale. This approach not only serves to photograph the state of students' digital skills, but also to explore the factors that influence their achievement, so that the results can be used as a basis for the development of more targeted educational curricula and policies. (Hu & Xu, 2024) (Muller et al., 2023)

The respondents of the study were 896 students from four public high schools in the city of Bandung. In terms of gender, 43.97% are male and 56.03% are female. The largest composition is students in grade XI (92.97%), while class X (6.70%) and class XII (0.33%) are only a small part. The majority of respondents were 17 years old (70.39%), according to the average age of high school students in Indonesia. This demographic data is important

because it allows for the analysis of differences in digital citizenship skills based on age, class, and gender variables. In survey research, respondent demographic information is an important component for interpreting results contextually, as well as being the basis for advanced inferential analysis. (Arnulf et al., 2018)

Data were collected using a closed-ended questionnaire on a five-point Likert scale (1 = never to 5 = always). The Likert scale is still the most widely used instrument for assessing attitudes, perceptions, and skills due to its ease of analysis and interpretation (Combrinck, 2024). This research instrument covers four main dimensions of digital citizenship: *digital access*, *digital communication*, *digital etiquette*, and *digital rights & responsibilities*. The data was then processed using descriptive statistics, including frequency, percentage, *mean*, and standard deviation, to illustrate the tendencies of respondents' answers. This descriptive analysis provides a preliminary overview of the student's skill level before further testing is carried out. (Hu & Xu, 2024)

In order to increase the validity of the results, this study used two stages of analysis. First, descriptive analysis is used to display a general profile of students' digital citizenship skills. Second, an inferential analysis was carried out using validity and reliability tests, as well as a difference test between groups of respondents. Recent literature shows that analysis of ordinal data such as the Likert scale continues to be developed to make the results more sensitive and accurate, for example through the Rasch approach or ordinal model-based methods. Another approach also emphasizes the importance of reliability in the processing of large-scale survey data to support education policy recommendations. With a combination of descriptive and inferential analysis, this study produces an overview as well as empirical evidence that can be used to strengthen the Pancasila Education curriculum at the high school level. (Combrinck, 2024) (Hu & Xu, 2024) (Muller et al., 2023)

RESULTS AND DISCUSSION

Result

The results of the digital citizenship skills survey of high school students were analyzed based on four main dimensions, namely Digital Access, Digital Communication, Digital Etiquette, and Digital Rights & Responsibilities. Each dimension has different strengths and weaknesses, illustrated by the indicators with the highest and lowest scores. This analysis provides a comprehensive overview of aspects that have developed well and areas that still need strengthening. A summary of the measurement results is presented in Table 1 below:

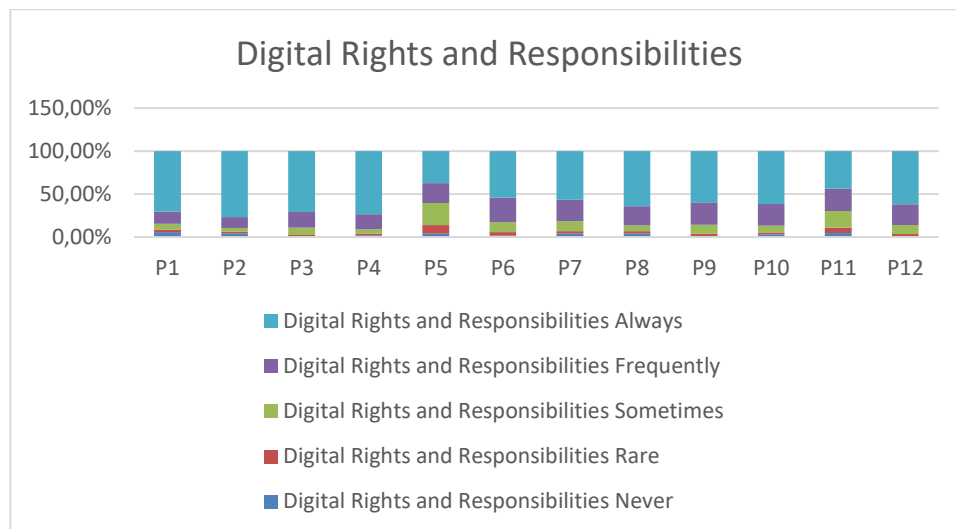
Table 1. Summary of Digital Citizenship and Moral Intelligence Skills Measurement Results

Yes	Dimension	Mean	SD	Highest Indicators	Lowest Indicator
1	Digital Access	4,25	0,839	Using a cellphone/laptop to study	Manage internet usage
2	Digital Communication	4,56	0,666	Speaking politely via the internet	Explain ideas clearly
3	Digital Etiquette	4,33	0,810	Encourage and support friends	Disseminate educational content
4	Digital Rights & Responsibilities	4,58	0,844	Avoid suspicious links	Create positive content

Mean: the average score of students' answers on each dimension (scale 1–5).

SD: standard deviation, indicating the level of variation in students' answers.

The results of the study show that the digital citizenship skills of high school students are generally in the medium to high category. The Digital Rights & Responsibilities dimension occupies the highest position with an average score of 4.58 and a standard deviation of 0.844. This shows that the majority of students have a good awareness of digital threats, especially in the indicator of "avoiding suspicious links." However, on the indicator of "creating positive content," the score obtained was lower, indicating that digital creativity has not developed optimally. This condition shows that there is a gap between awareness of digital security and the ability to contribute productively in the online space. In other words, even if students are skilled enough to maintain security and adhere to internet usage ethics, they still need encouragement to develop useful content creation skills and support positive participation as digital citizens.

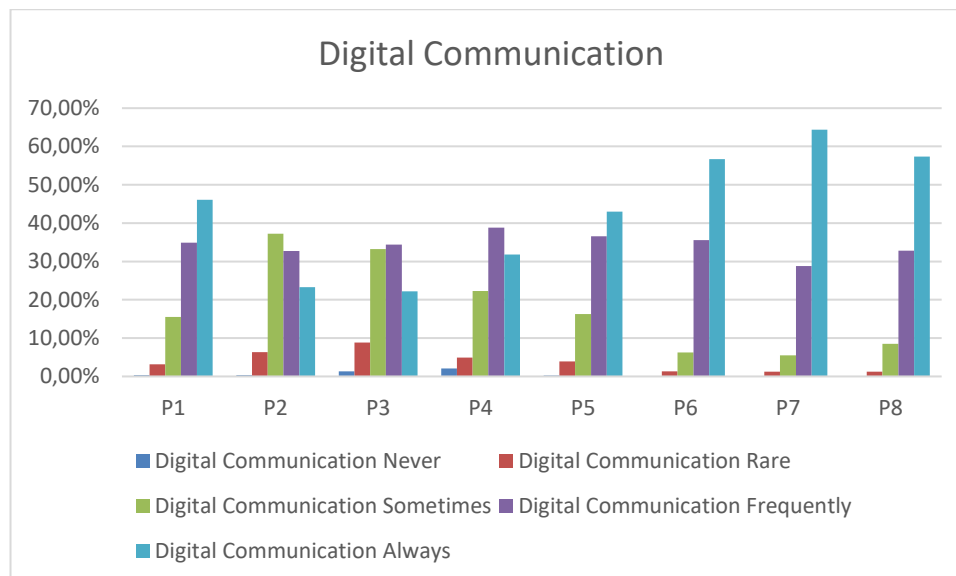


P1 : I do not share my personal account password with anyone., P2 : I refuse to provide personal data when registering on unclear websites., P3 : I use strong passwords for my digital accounts, P4 : I avoid clicking on suspicious links on the internet., P5 : I create content (writing, images, videos) to express my ideas in a positive way, P6 : I express my opinion in a way that does not offend others on social media, P7 : I do not share other people's photos or videos without permission, P8 : I do not share other people's personal information in group chats or on social media, P9 : I check the source of information before sharing it, P10 : I do not spread news whose truth is unclear, P11 : I avoid downloading pirated movies, songs, or applications., P12 : I use the internet according to the rules that apply at school and in society.

Figure 1. Digital Rights and Responsibilities

The image above shows the distribution of respondents' answers to each statement related to *Digital Rights and Responsibilities*. In general, the majority of students choose the *Always* category on almost all indicators, which indicates their high awareness of the security and digital responsibility aspects. For example, on the P2 indicator (refusing to provide personal data on unclear sites), more than half of respondents consistently answered *Always*, signaling a strong vigilance against potential privacy threats. However, the P5 indicator (creating positive content) shows a more diverse distribution of answers, with a significant proportion in the *Occasionally* to *Frequent* category. This indicates that even though students are already skilled in maintaining digital security, they are not fully accustomed to producing constructive content in the digital space. Thus, the digital rights and responsibilities dimension shows a combination of strengths in the aspect of self-protection, but also the challenge in the aspect of productive contribution.

The *Digital Communication dimension* showed an average score of 4.56 with a standard deviation of 0.666. This score confirms that students have positive habits in maintaining politeness in communicating in the digital space, as seen in the indicator of "speaking politely via the internet" which obtained the highest score. However, weaknesses still appear in the indicator of "explaining ideas clearly," which indicates that critical and argumentative communication skills have not been optimally developed. This limitation has the potential to hinder student participation in digital forums that require the ability to explain ideas with a logical and concise structure. These results confirm the importance of learning that not only emphasizes good manners in communication, but also trains the skills of conveying ideas clearly, critically, and persuasively. Thus, the aspect of digital communication needs to be viewed more broadly as a means to collaborate, discuss, and actively participate in the digital public space.

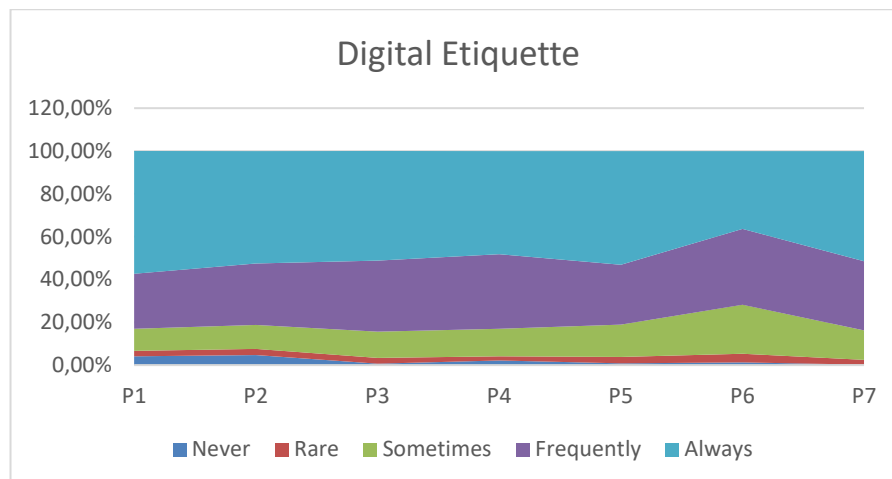


P1 : I choose the right app (such as WhatsApp or Google Meet) for learning, P2 : I manage the use of digital communication media so that it does not interfere with study time, P3 : I explain my ideas or questions clearly when discussing via digital media. P4 : I write messages or comments in easy-to-understand language when studying online, P5: I express my opinion politely and clearly in the class group, P6 : I respect my friends' opinions when discussing things online, P7 : I speak politely when sending messages to teachers or friends via the internet, P8 : I maintain my digital privacy by managing my accounts and only joining secure digital groups.

Figure 2. Digital Communication

The image above shows the distribution of respondents' answers on the Digital Communication dimension. It was seen that most students chose the Always category for indicators P7 (talking politely with friends or teachers over the internet) and P8 (maintaining digital privacy by setting up accounts), each with a proportion above 60%. This shows that ethical awareness in digital communication is quite high among students. In contrast, the P3 indicator (explaining ideas clearly when discussing online) obtained a more even distribution of answers, with a significant portion in the Occasional and Frequent categories. This condition confirms that effective communication skills, especially in conveying ideas with a logical structure, are still a challenge. Thus, these results show strengths in the aspect of digital politeness, but also weaknesses in argumentative skills that need to be improved through discussion-based learning, presentation, and digital collaboration.

Dimensi *Digital Etiquette* obtained an average score of 4.33 with a standard deviation of 0.810. The main strength is seen in the indicator of "encouraging and supporting friends," which reflects the presence of social empathy and solidarity in digital interactions. However, the use of social media to disseminate educational content is still not optimal, as shown by the lower scores. This condition shows that although students have internalized the values of empathy and social support in the digital space, they have not fully utilized technology to make a broader educational contribution. Thus, it is important for schools to encourage the use of digital media not only for entertainment and social interaction, but also for the dissemination of content that is positively charged and educational. These efforts can strengthen the function of digital etiquette as a foundation for more meaningful participation in the digital society.



P1 : I don't make fun of my friends on social media, P2 :I do not spread negative comments and will report to the teacher if I see a friend being bullied on the internet, P3 : I waited for my turn before writing my opinion in the online discussion, P4 : I don't interrupt or respond quickly when others are speaking during a video call. P5 : I save screenshots if there is important evidence that occurs online, P6 : I use social media to share educational or inspirational information, P7: I encourage and support friends who are experiencing difficulties through social media.

Figure 3. Digital Etiquette

The figure above shows the distribution of respondents' answers on the *Digital Etiquette* dimension. The majority of students tend to choose the *Always* category for almost all indicators, which describes their consistency in implementing digital ethics such as respecting friends, being polite, and supporting colleagues in the online space. Indicator P7 (encouraging and supporting friends who are struggling on social media) stands out with the largest proportion in the *Always* category, showing strong digital empathy among students. In contrast, the P6 indicator (using social media to disseminate educational and inspirational information) shows a more even distribution between the *Occasional* and *Frequent* categories, indicating that productivity in utilizing social media for educational purposes is still not optimal. These findings emphasize that even though students are good enough at maintaining polite and empathetic interactions, further encouragement is needed so that they are also actively producing useful digital content.

The *Digital Access* dimension has an average score of 4.25 with a standard deviation of 0.839. The highest indicator is "using a cellphone/laptop to learn," which shows that students are used to using personal devices to support the learning process. However, weaknesses are still seen in the indicator of "regulating internet use," which indicates low self-regulation skills in managing the time and intensity of digital technology use. This situation is important to note because adequate access is not always followed by the ability to utilize technology in a healthy and productive way. Therefore, digital literacy needs to be directed not only at technical abilities and device utilization, but also at the skill of managing use so that students do not experience distractions. This shows that the dimension of access must be comprehensively understood, including the availability of facilities as well as the ability to manage its use to support the learning process and daily life.

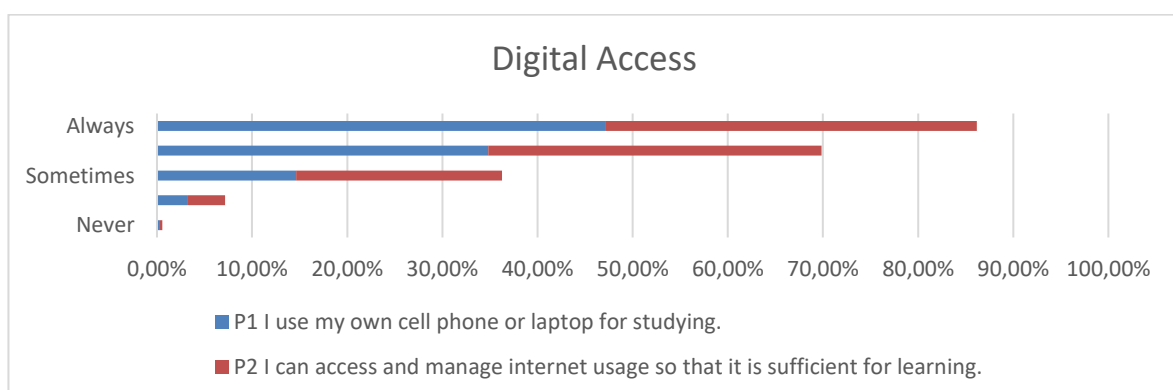


Figure 4. Digital Access

The image above shows the distribution of respondents' answers on the Digital Access dimension. The majority of students chose the Always category for the P1 indicator (using their own cellphone or laptop to study), which shows that access to personal devices is common and supports digital learning independence. Meanwhile, on the P2 indicator (regulating internet use so that it is sufficient for studying), although most students answered Often and Always, there is a considerable proportion that are still in the Occasional category. This indicates that obstacles in time management and control of internet use are still the main challenges. In other words, students relatively have adequate access to devices, but skills in managing the use of the internet in a healthy and productive manner need to be strengthened through more targeted digital literacy education.

Discussion

The measurement of high school students' digital citizenship skills needs to be carried out with valid and reliable instruments so that the results truly reflect conditions in the field. The instruments used in this study are based on four main dimensions: Digital Access, Digital Communication, Digital Etiquette, and Digital Rights & Responsibilities. Each item is designed using the Likert scale, which is then tested through validity and reliability analysis to ensure data consistency. The literature confirms that digital citizenship measurement instruments must incorporate technical, ethical, and participatory aspects, not just basic literacy. In this way, the survey results not only provide numbers, but also have a strong conceptual foundation. Good validity and reliability allow this instrument to be used as an empirical basis for evaluating students' digital skills on an ongoing basis, while supporting school efforts in measuring learning outcomes systematically. (Choi, 2016; Dass & Kumar M.P.M, 2024)

The results of this study show that the digital citizenship skills of high school students are in the medium to high category, with the main strength in the aspects of polite communication, privacy awareness, and digital security. These findings are consistent with the global literature that emphasizes digital citizenship as a multidimensional concept that includes technical skills, ethics, as well as socio-political participation. However, the results of the study also highlight a gap in the dimension of creativity, especially the ability to produce positive content. This is in line with the finding that the younger generation still plays a more important role as consumers of information than creators of meaningful content. From the theoretical side, this study enriches the digital citizenship discourse by showing the need to integrate digital productivity aspects in assessments, not just assessing ethical compliance or safe behavior. (Choi, 2016; Ribble, 2011) (Fernández-Prados et al., 2021)

The dimension of digital communication shows that although students are used to maintaining politeness in online interactions, they are not optimal in conveying ideas clearly. The literature confirms that meaningful digital participation demands more than just politeness, but also critical and argumentative communication skills. The theoretical plus of these findings is the need to expand the definition of digital citizenship skills towards critical thinking skills in online communication. From a practical perspective, this opens up opportunities for the integration of project-based learning in the Pancasila Education curriculum, which trains students to communicate ideas effectively in the digital space. Thus, the results of the study not only capture the current conditions, but also offer a direction of curriculum renewal to develop more in-depth and meaningful communication skills. (Dass & Kumar M.P.M, 2024; Zhang et al., 2024)

In the aspect of digital etiquette, students show empathy and solidarity by supporting friends in the online space, even though they still lack the use of social media for educational purposes. This condition reinforces the argument that digital citizenship assessments need to include a socio-citizenship dimension that assesses students' contributions to the community. The theoretical added value of these findings is the strengthening of the conceptual framework that links digital literacy with productive social participation. From a practical perspective, these results indicate the need for a learning strategy that emphasizes the constructive use of social media, so that students can be directed to become producers of educational content, not just entertainment consumers. This research thus expands the space for reflection for schools to foster a more ethical and useful digital culture, while opening up further research space to test the effectiveness of digital content-based learning models in increasing student contributions in online public spaces. (Peart et al., 2020) (Zheng et al., 2024)

The digital access dimension shows that students have independence in using personal devices to study, but still face challenges in managing internet usage time. emphasizing that digital literacy is not only about the availability of access, but also the ability to use it in a healthy, balanced, and productive way. A practical plus of these results is that it provides a basis for the development of digital literacy programs in schools that emphasize time management and self-control. Theoretically, this study emphasizes the need to include aspects of self-regulation into the framework of digital citizenship at the secondary education level. For the next research, it is important to conduct longitudinal

tests to see how internet usage management skills develop with age and learning exposure. This will deepen understanding of the interconnectedness between digital self-control, academic achievement, and participation as a responsible digital citizen. (UNESCO, 2024b) (Vallès -Peris & Domènech, 2024)

One of the unexpected findings in this study is the low digital creativity of students, particularly in terms of creating positive content, even though they have high skills in maintaining digital safety and communicating politely. This condition is contrary to the common assumption that the younger generation as *digital natives* automatically has the ability to create innovative content. Previous studies have shown that adolescents' digital participation is more often limited to information consumption and light social interactions, rather than to the production of meaningful content. These results show that access to technology and basic literacy are not enough to encourage creativity, but need to be supported by learning that emphasizes the production of educational and participatory content. This is in line with UNESCO's (2024) recommendations that emphasize the importance of equipping students with advanced digital skills, so that they can become active contributors, not just passive users in digital public spaces. (Fernández-Prados et al., 2021; Peart et al., 2020)

The results of measuring digital citizenship skills can be an important reference to strengthen the Pancasila Education curriculum in schools. The research findings show that students excel in aspects of digital security and ethics, but are still weak in content creativity and critical communication. This condition can be used as a basis for teachers to design deep learning-based learning that emphasizes digital project creation, critical discussion, and the dissemination of educational content. Frameworks such as DigComp 2.2 and DigCompEdu can be combined with national policies on Deep Learning to ensure the curriculum is truly adaptive to the needs of the digital age. Thus, the survey results do not stop at the evaluation level, but can be used to develop pedagogical strategies that foster critical, creative, and responsible digital citizens, in accordance with the goals of the Pancasila Student Profile. (Redecker & Squirrel, 2017; Vuorikari et al., 2022) (Ministry of Primary and Secondary Education of the Republic of Indonesia, 2025)

CONCLUSION

The results of this study confirm that the digital citizenship skills of high school students have developed in the medium to high category, with strength in digital security, politeness in communication, and privacy awareness, but still weak in content creativity and internet use regulation. From the theoretical side, this study enriches the digital citizenship discourse by adding the dimensions of productivity and self-regulation to the assessment framework, in line with the global literature that emphasizes digital citizenship as a multidimensional concept. From a practical perspective, these results provide important input for schools and policymakers to strengthen the Pancasila Education curriculum based on deep learning, which not only trains technical literacy but also critical communication, positive contribution, and digital time management. In the future, further research needs to test assessment instruments in a longitudinal local context and develop curriculum-based interventions that can optimize students' roles as critical, creative, and responsible digital citizens.

REFERENCES

- Ananto, P., & Ningsih, S. K. (2023). An examination of Indonesian teachers' and students' perception and level of digital citizenship. *Heliyon*, 9(8), e18987. <https://doi.org/10.1016/j.heliyon.2023.e18987>
- Arnulf, J. K., Larsen, K. R., & Martinsen, Ø. L. (2018). Respondent Robotics: Simulating Responses to Likert-Scale Survey Items. *Sage Open*, 8(1). <https://doi.org/10.1177/2158244018764803>
- Choi, M. (2016). A Concept Analysis of Digital Citizenship for Democratic Citizenship Education in the Internet Age. *Theory & Research in Social Education*, 44(4), 565–607. <https://doi.org/10.1080/00933104.2016.1210549>
- Combrinck, C. (2024). Not Liking the Likert? A Rasch Analysis of Forced-choice Format and Usefulness in Survey Design. *Sage Open*, 14(4). <https://doi.org/10.1177/21582440241295501>
- Connolly, R., & Miller, J. (2022). Evaluating and Revising the Digital Citizenship Scale. *Informatics*, 9(3), 61. <https://doi.org/10.3390/informatics9030061>
- Dass, A., & Kumar M.P.M, P. (2024). Instruments for measuring Digital Citizenship Competence in schools: a scoping review. *Journal of E-Learning and Knowledge Society*, 20(2), 9–18. <https://doi.org/10.20368/1971-8829/1135934>
- Fernández-Prados, J. S., Lozano-Díaz, A., & Ainz-Galende, A. (2021). Measuring Digital Citizenship: A Comparative Analysis. *Informatics*, 8(1), 18. <https://doi.org/10.3390/informatics8010018>
- Hu, P., & Xu, H. (2024). Student Teachers' Perceptions and Application of Questionnaire Survey in an EFL Context.

- Sage Open*, 14(2). <https://doi.org/10.1177/21582440241245621>
- Iskandar, R., Maksum, A., & Marini, A. (2025). Digital citizenship literacy in Indonesia: The role of privacy awareness and social campaigns. *Social Sciences & Humanities Open*, 12, 101697. <https://doi.org/10.1016/j.ssaho.2025.101697>
- Kementerian Pendidikan Dasar dan Menengah Republik Indonesia. (2025). *Naskah Akademik Pembelajaran Mendalam: Menuju Pendidikan Bermutu Untuk Semua*. Kemendikdasmen.
- Muller, S. H., van Thiel, G. J., Mostert, M., & van Delden, J. J. (2023). Dynamic consent, communication and return of results in large-scale health data reuse: Survey of public preferences. *DIGITAL HEALTH*, 9. <https://doi.org/10.1177/20552076231190997>
- Peart, M. T., Gutiérrez-Esteban, P., & Cubo-Delgado, S. (2020). Development of the digital and socio-civic skills (DIGISOC) questionnaire. *Educational Technology Research and Development*, 68(6), 3327–3351. <https://doi.org/10.1007/s11423-020-09824-y>
- Prasetyo, W. H., Naidu, N. B. M., Sari, B. I., Mustofa, R. H., Rahmawati, N., Wijaya, G. P. A., & Hidayat, O. T. (2021). Survey data of internet skills, internet attitudes, computer self-efficacy, and digital citizenship among students in Indonesia. *Data in Brief*, 39, 107569. <https://doi.org/10.1016/j.dib.2021.107569>
- Prasetyo, W. H., Naidu, N. B. M., Tan, B. P., & Sumardjoko, B. (2021). Digital citizenship trend in educational sphere: A systematic review. *International Journal of Evaluation and Research in Education (IJERE)*, 10(4), 1192. <https://doi.org/10.11591/ijere.v10i4.21767>
- Redecker, C., & Punie, Y. (2017). *European Framework for the Digital Competence of Educators: DigCompEdu*. Publications Office of the European Union. <https://doi.org/10.2760/178382>
- Ribble, M. (2011). *Digital Citizenship in Schools: Nine Elements All Students Should Know*. International Society for Tech in Ed.
- Tapias, B. H., Guzmán, D. H., Muñoz, P. C., & Duarte, N. R. (2024). Digital Citizenship and Sustainable Governance: A Design Thinking Approach. *Procedia Computer Science*, 231, 78–85. <https://doi.org/10.1016/j.procs.2023.12.175>
- UNESCO. (2023). Digital citizenship in Asia-Pacific: translating competencies for teacher innovation and student resilience. In *Digital citizenship in Asia-Pacific: translating competencies for teacher innovation and student resilience*. UNESCO Publishing. <https://doi.org/10.54675/NNVF6123>
- UNESCO. (2024a). *Global citizenship education in a digital age: Teacher guidelines*. UNESCO Publishing.
- UNESCO. (2024b). *Global education monitoring report 2024/5: Leadership in education – Lead for learning*. UNESCO Publishing.
- UNESCO-UNEVOC. (2025). *World Youth Skills Day 2025 youth survey report on AI and digital skills*. UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training. UNESCO.
- Vallès-Peris, N., & Domènech, M. (2024). Digital citizenship at school: Democracy, pragmatism and RRI. *Technology in Society*, 76, 102448. <https://doi.org/10.1016/j.techsoc.2023.102448>
- Vuorikari, R., Kluzer, S., & Punie, Y. (2022). *DigComp 2.2: The digital competence framework for citizens – With new examples of knowledge, skills and attitudes*. Publications Office of the European Union.
- Zhang, Y., Kaya, D. I., & van Wesemael, P. (2024). An assessment framework for digital participatory practices engaging youth in cultural heritage management. *Journal of Cultural Heritage*, 70, 408–421. <https://doi.org/10.1016/j.culher.2024.10.014>
- Zheng, Y., Zhang, J., Li, Y., Wu, X., Ding, R., Luo, X., Liu, P., & Huang, J. (2024). Effects of digital game-based learning on students' digital etiquette literacy, learning motivations, and engagement. *Heliyon*, 10(1), e23490. <https://doi.org/10.1016/j.heliyon.2023.e23490>