

Strengthening Digital Citizenship through Citizenship Education Based on Science, Technology and Society in Era 4.0

Bali Widodo¹, Suwarma Al Muchtar², Endang Danial AR³

¹Institut Teknologi Nasional Bandung, Indonesia

^{1,2,3}Citizenship Education Study Program, Faculty of Social Sciences Education, Universitas Pendidikan Indonesia, Bandung, Indonesia

baliw@itenas.ac.id

Abstract

The purpose of this study was to determine the strengthening of digital citizenship through science, technology and society-based Citizenship Education courses in the 4.0 era. The method used in this research is descriptive qualitative, collecting data through interviews, documentation and observation. The results of the study show that 1) strengthening digital citizenship through Civics Education courses based on science, technology and society in the 4.0 era is forming civic competence, 2) Strengthening digital citizenship through Citizenship Education courses requires digital habituation in students' daily lives. 3) Approach to Science, Technology and Society (STM) to answer the problems that exist in the community so that learning becomes more meaningful. Strengthening digital citizenship through science, technology and community-based civics learning in the 4.0 era in the end is towards smart and good citizens.

Keywords

digital citizenship; citizenship education; science; technology; society in era 4.0



I. Introduction

Digital citizenship has recently become increasingly popular along with the monopoly on the use of technology in human life. The digital era can be said to have an influence on all fields of human life, not least journalism (Saragih, 2020). Nevertheless, the wave of digital activism has become a creative means for citizens to develop global and local discourses (Bo'do 2019). Bialy (2017) stated that the motivation in using digital media has undergone a shift, one of which is used to find information. The use of digital media gradually places its users in global citizens so as to form their digital citizenship identity in the digital world. Hussain (2010) said that in digital media there has also been transaction activity. From that it can be said that in fact, the main purpose of using digital media is to facilitate communication in a wider scope. Digital media has supported human life in various aspects, on the other hand there is an encouragement in affirming digital citizenship of digital media users which ultimately leads to their digital ethics. The number of digital media has led to a deeper study of digital citizenship. Demuyako (2020) said that digital media is called by many people as New media. Therefore, with the many emerging new media that can be a means for citizens to express their aspirations in development, firstly as users of digital media, they must first understand how their digital citizenship is.

Digital citizenship in the scientific study of Citizenship Education is seen as a result of the movement of media. Ayun (2015) said that media transfer is to integrate text, video, images and sound into one medium. From this it can be understood that in the rules of digital media, it will bring one's private space into the public space that forms digital citizenship. Learning science and technology in society in the 4.0 era can strengthen the character of digital citizenship. Budimansyah & Suryadi (2008) states Citizenship Education as value

education, and from this value, citizen development is meant to include digital citizenship. Halimah, Dawn, & Hidayah, (2021) emphasized that character in Citizenship Education cannot be separated. Therefore, learning science and technology is also expected to coincide with strengthening the character of digital citizenship. Strengthening the character of digital citizenship through community science and technology learning in the 4.0 era must be in line with creative, innovative and honest values. Millner (2002) states that critical technological literacy is useful in improving critical understanding skills. By utilizing science-technology-based Citizenship Education, the substance of digital citizenship will slowly build up.

The character of digital citizenship will be able to provide an understanding of society's civility, especially digital society. Mossberger & Tolbert (2008) states that digital citizenship is the ability to participate in online society. The revitalization of digital citizenship here is related to the management of digital attitudes and ethics that can align with their social functions as a digital society. Digital media can affect the shape and identity of a person. Based on the results of a survey from the Association of Internet Service Providers (PPJII) that in 2018 internet users in Indonesia experienced an increase. The results of the survey are as follows:



Figure 1. Internet Users

Source: <https://qwords.com/blog/jumlah-pengguna-internet-di-indonesia/>

From the survey results, it can be understood that Indonesia is one of the countries that has many internet users. Blossom (2009) states that the use of technology facilitates access to human social coverage. Therefore, digital ethics must be emphasized and nurtured in every individual in order to create digital citizenship that has responsible behavior and norms so that it reflects the ideal Indonesian human. Digital citizenship is intended so that every individual internet user has attitudes and behaviors like in real life. Omenugha (2018) states that digital media is widely used to represent the use of computers to be combined with various forms of media. Thus, digital citizenship can contribute to strengthening the national identity of citizens in cyberspace.

There are various factors that can influence the ethics in cyberspace and the process of forming digital citizenship. Holig & Hasebrink (2018) stated if the use of the internet has become the biggest breakthrough and has a good impact on digital media in recent years. In these situations, digital citizenship guides and prevents cyberbullying and cyberharrasment from happening. Learning science, technology and society in Citizenship Education is a hope in strengthening the character of digital citizenship. Ribble (2008) stated that digital citizens are required to have several characteristics such as understanding cultural and social issues related to technology, law and ethics. The character of digital citizenship here exploits the

sustainability of digital society's life to organize their digital ethics. Social rules in the digital world are an important part of the concept of digital citizenship character. Hidayah, Sapriya, Darmawan, Malihah, & Karliani (2020) states that the intelligence of citizens needs to be developed. In connection with the problem of strengthening the character of digital citizenship, efforts to strengthen the character of digital citizenship through science and technology learning are important.

A student as the younger generation is a generation that is sufficient with the internet and digital devices. it is not uncommon for the phenomenon of the younger generation to do things that are not in accordance with good ethics in cyberspace. Roztocki et al (2019) states that today's computers have helped individuals, governments and corporate organizations in carrying out their daily tasks. In this situation, digital citizenship promotes social stability between the real world and the cyber world. Based on the findings of observations that researchers have conducted in January-December 2020 at the ITB Campus regarding the development of Civics Education learning based on science, technology and society, ITB students have considerations in their digital citizenship, especially in the use related to their digital socialization platform, namely social media. Thus, based on the results of these observations, it can be said that ITB students really maintain their existence in the digital socialization platform so that their digital ethics are very well maintained and this is where the urgency of research on strengthening digital citizenship occurs through Civics Education courses based on science, technology and society for ITB students.

The purpose of this study was to determine the strengthening of digital citizenship through Civics Education courses based on science, technology and society in the 4.0 era. The formulation of the problem in this research is how to strengthen digital citizenship through science, technology and society-based Citizenship Education courses in the 4.0 era? The urgency of the research is the importance of strengthening digital citizenship in society in the 4.0 era. The novelty of this research is to contribute to efforts to strengthen digital citizenship through Citizenship Education courses, especially Citizenship Education subjects based on science, technology and society in the 4.0 era.

II. Research Methods

This study uses a qualitative approach, Creswell (2010) states if the qualitative approach examines in natural conditions and researchers as research instruments. The qualitative approach in this study is intended to facilitate the search for strengthening digital citizenship through science-technology-based Citizenship Education courses and society in the 4.0 era. This research was conducted in the city of Bandung during January-December 2020 with the research subjects of ITB lecturers and students selected randomly in each department at ITB. Data collection in this study used interviews with students about strengthening digital citizenship through science-technology-based Citizenship Education courses and society in the 4.0 era. Furthermore, data collection through documentation from reference sources regarding strengthening digital citizenship through Citizenship Education courses based on science, technology and society in the 4.0 era. Other data collection is using structured interviews for 20-40 minutes on research subjects. Data analysis in this study used data analysis by Miles and Huberman, namely 1) data reduction, 2) data display and 3) conclusions.

III. Discussion

Based on the problem formulation, the results of this study produced three research results on how to strengthen digital citizenship through science, technology and society-based Citizenship Education courses in the 4.0 era. In order to maintain research ethics, the informants in this research use initials. The results and discussion in this study are divided into two sub-topics as follows.

3.1 Strengthening Digital Citizenship through Science, Technology and Society-Based Citizenship Education Courses in Era 4.0 is to Establish Civic Competence

Based on the results of research on strengthening digital citizenship through Citizenship Education courses based on science, technology and society in era 4.0, data is generated that civic competence in digital citizenship is a combination of civic knowledge, civic disposition, and civic skills. Lippe (2019) states if new media, both legacy organizations, and digital birth organizations have increased revenue-based. Students as digital citizens must have skills, knowledge in accessing technology without abandoning ethics as responsible citizens. The results of interviews with students at ITB stated that in today's digital era, through digital media, people are free to express themselves. However, it is also necessary to use skills in managing and utilizing digital media.

Interviewer : "What do you think about digital media and identity in cyberspace?"

APBD : "In my opinion digital media and identity in cyberspace cannot be separated, because digital media can be free of expression, but there are also many things that must be considered in using digital media."

Meanwhile, BW added that "digital media and identity in cyberspace are another form of life in the real world". Then ESRW added that "identity in cyberspace is another space of life in utilizing technology". Based on the results of these interviews, it can be concluded that students at ITB have awareness in digital citizenship and digital ethics. Poort et al (2018) stated that the entertainment industry did not lag behind the many contributions of digital media. In the context of digital citizenship, it is a combination of civic knowledge, civic disposition, civic skills in the perspective of science-technology-based citizenship education and society.

Strengthening students' digital citizenship at ITB with ownership of digital ethics supports a higher quality digital life and becomes a source of inspiration in maintaining the digital environment of students at ITB. Isman & Gungoren (2014) stated that being a digital citizen is more important in this day and age. Isman & Gungoren emphasized that the goal of digital citizenship in the 21st century is to make students digital citizens. The findings in the field show that students at ITB have digital media and upload content in a polite manner that includes their daily activities. Cambren (2009) suggest that social media platforms prohibit activities such as, terrorist activities, untrue content and threats of violence. This can be concluded if ITB students have digital awareness and digital ethics that can place their digital citizenship positively. Digital citizenship students at ITB have critical thinking in the concept of digital citizenship, especially in terms of digital awareness and ethics. Students at ITB think critically before doing anything on their social media. Daniel (2007) states that economic and social activities depend on information and communication technology. Critical thinking in the concept of digital citizenship makes Civic Education based on science, technology and society make social interactions of students at ITB increasingly increase awareness and digital ethics.

Civic competence in strengthening digital citizenship through Citizenship Education courses based on science, technology and society has made its users to continue to comply with the rules and norms that apply in their real world, Fahrimal (2018) Civic competence in strengthening digital citizenship through Citizenship Education courses based on science, technology and society has made its users to continue to comply with the rules and norms that apply in their real world, Fahrimal (2012) namely as in character education and value education. In strengthening digital citizenship by fostering science-technology-based learning and society, digital citizenship is compatible with society in the 4.0 era. Report (2019) stated that digital media has increased globalization by making communication with and from other parts of the world very easy and at a lower cost.

The combination of civic knowledge, civic disposition, and civic skills to form civic competence ultimately forms a smart and good citizen. Ohame (2018) states that the form of citizen participation has four dimensions, namely obedient, optional, individual and collective. Based on the results of research on strengthening digital citizenship through Citizenship Education courses based on science, technology and society in the 4.0 era, it was found that civic competence in digital citizenship resulted in that digital media is a virtual space that has various dimensions of interest. This is where the strengthening of digital citizenship lies in the comfort and conduciveness of interacting in cyberspace.

The results of interviews with students at ITB stated that in the Citizenship Education course there is a process in the intelligence of citizens, especially in their association as Indonesian humans.

Interviewer : "What do you think about the Citizenship Education course in strengthening digital citizenship?"

MTH : "In my opinion in the Citizenship Education course, there are efforts in educating citizens to conform to the noble values of the nation"

Meanwhile, SS added that "in the Citizenship Education course, citizen education in digital media is based on science, technology and society which is linked to society in the 4.0 era". Then EP added that "Citizenship Education courses educate to stay comfortable in socializing as citizens, both in the real world and in cyberspace. Based on the results of these interviews, it can be concluded that students at ITB have knowledge as citizens and digital citizens who have their rights, laws and obligations in the digital world. Mossberger, K.,(2008) states that digital citizens are those who regularly use the internet. In the context of digital citizenship, the meaning of digital citizenship is the perfection of civic competence related to strengthening the digital character of citizens by upholding values and norms in digital ethics and their position as citizens.

Strengthening digital citizenship through science, technology and community-based citizenship education courses for students at ITB makes them have critical thinking about the existence of digital citizenship. United Nations (2006) states that Governments and world leaders are committed to building an information society. In the context of digital citizenship, this information society is oriented towards building knowledge about information technology. Through strengthening digital citizenship, students at ITB have the habit of thinking critically before doing something that can have a negative impact on their environment. Maier & Warren (2000) states it should be noted, however, that some global learners may have difficulty with the benchmark approach, appearing disorganized in the middle of their work so educators need to consider different styles of individual manipulation.

3.2 Strengthening Digital Citizenship Through Citizenship Education Courses Requires Digital Habituation

Based on the results of research on strengthening digital citizenship through Citizenship Education courses based on science, technology and society in the 4.0 era, data is generated that strengthening digital citizenship requires digital habituation in students' daily lives. Ameli (2010) states that humans began to live in different places as one community because they communicate and share information with each other all the time. Rusniati (2015) states that in the progress of the world, ethics and morals are one of the greatest challenges. The results of interviews with ITB students show that digital habituation in students' daily lives will form their digital identity as a form of respect for applicable ethical values.

Interviewer: "How is your digital habituation in your daily life?"

ARM: "My digital habit in everyday life is to use digital platforms according to my needs".

Meanwhile, OBT added that "my digital refraction depends on where I am" Then Acd added that "I think digital refraction can teach me about digital ethics". Based on the results of these interviews, it can be concluded that students at ITB have strengthened digital citizenship in their daily lives. In the context of digital citizenship education, this is a form of citizenship practice as a smart and good citizen. Science, technology and society-based citizenship education courses in the 4.0 era are a supplement for students to be able to have and think (critically) science. Common Core State Standards Initiative (2010) reaffirms the need for digital citizenship across educational curricula. The Common Core State Standards Initiative emphasizes that the most direct is to use technology and digital media strategically and competently, but also to be supported by responding to various digital demands. Strengthening digital citizenship through citizenship education courses requires digital habituation in students' daily lives. Joseph (2005) states that the prerequisite in democracy is access to information. In the context of digital habituation in students' daily lives, this is a confirmation of the element of awareness of the rules (laws). Kansil (1986) states if the elements in awareness of the rules (laws) are 1) regulations in attitude; 2) regulations from official bodies (authorities); 3). coercive regulations and 4) sanctions for violating the rules.

The findings in the field show that students at ITB have digital habits in their daily lives. Digital habituation in Strengthening digital citizenship has promoted the issue of citizenship. Reichert & Print (2017) stated that the news media had sparked a discussion on the issue of citizenship. Thus, to strengthen citizenship, competence development is not only in civic skills and civic knowledge but also civic disposition. Digital habituation in the daily life of ITB students causes them to think critically before doing something. Dwiyatmi et al (2012) stated that the competency standard for Citizenship Education in Higher Education is that students can apply their democratic values and knowledge. Frau-Meigs D et All (2017) states international educational practices and programmes, has shaped different ideas and approaches to digital citizenship since its inception. In terms of digital citizenship, this presents many aspects in optimizing community competence in the digital citizenship space. Digital citizenship through science-technology-based citizenship education courses is considered to be one of the pillars in the affirmation of digital citizenship. Azis Wahab in Sofyan & Dadang (2015) states that citizens who understand their rights and obligations are good and intelligent citizens. Therefore, the existence of digital citizens should provide its own color in the role of citizens in government.

Digital citizenship through citizenship education courses is a system and governance in the hegemony of the digital world. Instead of strengthening digital citizenship, it needs to be balanced with digital citizen intelligence. Mascheroni, (2015) emphasizes that self-

actualization is one way to achieve change in society. Therefore, in the perspective of digital citizenship, digital refracton is a way to train citizens to be smart and good citizens.

3.3 The Role of Science Technology and Society (STM) in Strengthening Digital Citizenship

Based on the results of research on strengthening digital citizenship through Civics Education courses based on science, technology and society in the 4.0 era, data is generated that the role of STM contributes to strengthening digital citizenship. Ribble & Bailey (2007) states that the concept of digital citizenship has evolved from one of the first definitions of digital citizenship written by Ribble and Bailey. In terms of strengthening digital citizenship, of course, this is one of the findings in the role of STM.

The results of interviews with students at ITB stated that STM contributed to strengthening digital citizenship by providing knowledge and understanding about the implications of STM in their digital lives.

Interviewer: "What do you think about the contribution of STM in strengthening digital citizenship?"

DAD: "I think STM contributes to strengthening digital citizenship by providing critical knowledge about roles in the digital environment"

Meanwhile, SD added that "STM contributes to strengthening digital citizenship by serving as ammunition for the practice of digital citizenship". Then SA added that "identity in cyberspace will be more focused with STM". Based on the results of these interviews, it can be concluded that students at ITB have an understanding of STM contributing to strengthening digital citizenship. The STM approach can answer the problems that exist in the community so that learning becomes more meaningful. Ryland (2018) placing different approaches and definitions of digital citizenship into four groups: digital literacy, digital access, digital character, and community involvement. In the STM concept, strengthening citizenship is related to their wise use of social media. The role of STM in strengthening digital citizenship emphasizes that Citizenship Education has a part in being a good citizen. Pangrazio (2021) argues that conceptual debates in the definition of citizenship exist in various theoretical approaches described by different authors. Therefore, strengthening digital citizenship through STM is, after all, a reconceptualization of digital citizenship and its application in instruments for strengthening digital citizenship.

Strengthening digital citizenship through the role of STM cannot be separated from people's lives today. Soh, Arsad, & Osman (2010) stated that the availability of the internet and digital technology promises easier connectivity in society, starting from the way people communicate, collaborate, create jobs, solve problems, make decisions, to consume information. In the context of digital citizenship, the speed of communication access in the availability of digital technology is a wetland for strengthening digital citizenship. Digital citizenship is from revolutionizing human life. M. S. Ribble, Bailey, & Ross (2004) stated that digital citizenship has become a priority for education that sees technology integration as a key teaching and learning strategy to prepare students to live and work in the 21st century. Digital technology has intimidated people's digital life, in digital citizenship people will be very easy in hand devices and this is what will make STM have a role in strengthening their digital life.

The role of STM in strengthening citizenship is to use technology appropriately. Logan (2016) states that the introduction of the worldwide web has changed the boundaries within the community and the world regarding our moral and civic responsibilities as a global

community. In the context of digital citizenship, the existence of this technology is one form of increasing the front line to become citizens of the digital world. As technology advances this will necessitate continued dialogue and policy changes about educating young people. The role of STM in Strengthening citizenship goes hand in hand with the promotion of the 21st century skills needed for the future. Hollandsworth, Dowdy, & Donovan (2011) argues that the idea of a globally connected citizenship arises because of its direct connection with the world at large. This is where Dowdy, & Donovan asserts if technology is also starting to push the socio-political agenda and about how education should change to prepare students for the 21st century skill set.

Based on the results of this study, the role of STM in strengthening digital citizenship has led to a technological society that is productive and safe and has digital ethics. Wagner (2003) states that schools are required to take online standardized tests that do not take into account where schools rank in mastering academic competencies, but also pay attention to digital interventions. The strengthening of digital citizenship is changing the boundaries in the community and the world regarding moral responsibility and citizenship as a global community. 21st century skills here play a role in educating citizens digitally.

IV. Conclusion

Based on the research that has been done, it can be concluded that 1) strengthening digital citizenship through Civics Education courses based on science, technology and society in the 4.0 era is forming civic competence, 2) Strengthening digital citizenship through Citizenship Education courses requires digital habituation in everyday life. student day. Strengthening digital citizenship through science, technology and community-based civics learning in the 4.0 era is ultimately towards smart and good citizens. 3) The STM approach is to answer the problems that exist in the community so that learning becomes more meaningful. Based on field findings through observations in strengthening digital citizenship through Citizenship Education courses based on science, technology and society in the 4.0 era, ITB students have good digital awareness so that ITB students simply maintain the form of their attitudes and movements in the digital world that can strengthen their citizenship. their digital.

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