DIGITAL CITIZENSHIP COMPETENCY THROUGH PROJECT-BASED LEARNING AMONG PRE-SERVICE TEACHERS IN INDONESIA

WIBOWO HERU PRASETIYO

SULTAN IDRIS EDUCATION UNIVERSITY

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WIBOWO HERU PRASETIYO

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APPRECIATION

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ABSTRACT

Digital technology presents both advantages and risks for users. Teacher education institutions bear the responsibility of equipping pre-service students with the necessary knowledge, skills, and attitudes to become responsible users of technology. The social challenges associated with technology usage necessitate teacher support, with a specific focus on digital citizenship education. This research endeavor aims to examine the understandings, perspectives, and experiences of digital citizenship among pre-service teachers through project-based learning approach. The study adopts a case study design, utilizing an interview instrument to gather data from twenty pre-service teachers who were purposefully sampled from Universitas Muhammadiyah Surakarta and enrolled into a digital citizenship course. The study draws upon Mike Ribble's nine elements of digital citizenship, Thomas' project-based learning (PBL) framework, and Westheimer and Kahne's typology of good citizenship. The collected data was analyzed using thematic analysis methodology facilitated by Nvivo 12 Plus software. The findings indicates that pre-service teachers perceived digital citizenship as a combination of knowledge, skills, and values necessary for the safe and responsible use of technology. Engaging in project-based learning has raised pre-service teachers' understanding and knowledge of digital citizenship. They perceived that project-based learning has enhanced students' autonomy and involvement in comprehending the digital realm, as well as providing opportunities to enhance their 21st-century learning skills. Project-based learning has promotes pre-service teachers' digital citizenship knowledge, competencies, and beliefs regarding the ethical, legal, and responsible use of technology. Integrating digital citizenship education and project-based learning can address students' engagement in justice advocacy, critical empathy, and political participation. Consequently, this study implies that alternative teaching and learning strategies should be explored as means to foster digital citizenship knowledge, skills, and values. Stakeholders should also play an active role in ensuring that digital citizenship is comprehended and practiced in the daily lives of citizens.

KOMPETENSI KEWARGANEGARAAN DIGITAL MELALUI PEMBELAJARAN BERASASKAN PROJEK DALAM KALANGAN GURU PRA PERKHIDMATAN DI INDONESIA

ABSTRAK

Teknologi digital menawarkan pengguna kedua-dua faedah dan ancaman. Oleh itu, institusi pendidikan guru perlu memastikan pelajar mempunyai pengetahuan, kemahiran dan sikap untuk menjadi pengguna teknologi yang bertanggungjawab. Cabaran sosial yang berkaitan dengan penggunaan teknologi memerlukan sokongan guru dengan penekanan terhadap pendidikan kewarganegaraan digital. Kajian ini menyelidiki pengetahuan, pandangan dan pengalaman guru pra perkhidmatan tentang kewarganegaraan digital melalui pembelajaran berasaskan projek. Kajian ini menggunakan reka bentuk kajian kes menerusi instrument temu bual melibatkan dua puluh guru pra perkhidmatan yang dipilih secara persampelan bertujuan dari Universitas Muhammadiyah Surakarta yang mendaftar kursus kewarganegaraan digital. Penyelidikan ini dipandu oleh sembilan elemen kewarganegaraan digital *Mike Ribble*, pembelajaran berasaskan projek (PBP) Thomas dan jenis kewarganegaraan yang baik *Westheimer* dan *Kahne*. Data dianalisis menerusi perisian Nvivo 12 Plus dengan menggunakan kaedah analisis tematik. Dapatan menunjukkan bahawa guru pra perkhidmatan melihat kewarganegaraan digital sebagai satu set pengetahuan, kemahiran dan nilai yang diperlukan untuk menggunakan teknologi dengan selamat dan bertanggungjawab. Penglibatan dalam pembelajaran berasaskan projek telah meningkatkan pengetahuan dan pemahaman guru pra perkhidmatan terhadap kewarganegaraan digital. Mereka percaya bahawa PBP meningkatkan autonomi dan penglibatan pelajar dalam memahami dunia digital. PBP juga memberi peluang kepada pelajar untuk meningkatkan kemahiran pembelajaran abad ke-21 mereka. PBP telah memperkukuh pengetahuan kewarganegaraan digital guru pra perkhidmatan, kebolehan dan kepercayaan berkenaan penggunaan teknologi yang selamat, sah dan bertanggungjawab. Penyertaan pelajar dalam mengamalkan advokasi keadilan, empati kritikal dan penyertaan politik boleh ditangani dengan mengetengahkan pendidikan kewarganegaraan digital dan PBP. Implikasi kajian menunjukkan strategi pengajaran dan pembelajaran lain harus diteliti sebagai alat untuk mempromosikan pengetahuan, kemahiran dan nilai kewarganegaraan digital. Pihak berkepentingan harus memainkan peranan dalam memastikan kewarganegaraan digital difahami dan diamalkan dalam kehidupan seharian warganegara.

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LIST OF ABBREVIATION

AUPS	Acceptable Use Policies
BIE	the Buch Institute for Education
BYOD	Bring Your Own Device
CCE	Center for Civic Education
COD	Cash on Delivery
ISTE	the International Society for Technology in Education
MOCI	the Ministry of Communication and Informatics
MOEC	the Ministry of Education and Culture
NETS	National Educational Technology Standards for Teachers
PBL	Project-Based Learning
PIC	Person-In-Charge
PPKN	Pendidikan Pancasila dan Kewarganegaraan
REP	Respect Educate Protect
TPACK	Technological Pedagogical Content Knowledge
UMS	Universitas Muhammadiyah Surakarta

CHAPTER 1

INTRODUCTION

1.1. Introduction

Digital citizenship has become a contested issue, particularly with regard to the role of education in preparing children to engage in the digital environment. The notion of digital citizenship challenges policymakers and educators to equip students with the skills, traits, and behaviors required to become lifelong learners who respect the rights of others and utilize technology responsibly. It is important for teachers to know about and understand the idea of digital citizenship if they want to help students become good digital citizens with respect to human rights, the rule of law, and democracy in cyberspace. This study investigates the digital citizenship competency among pre-service teachers. It focuses on the impact of employing project-based learning toward digital citizenship competency among pre-service teachers. Researcher explores the current experience of pre-service teachers using project-based learning and the use of project-based learning to improve digital citizenship competency among pre-service teachers. This chapter presents the background research, the problem statement,

following with research objectives and research questions. Next, it also presents the conceptual framework, the operational definition of terms, significance and limitation of the study and conclusion.

1.2. Background Research

The emergence of the internet has reformed the entire educational system, especially in 21st-century education. It widely-known that the internet promotes education beyond geographical and time boundaries (Harsasi, 2015; Kuntoro & Al-Hawamdeh, 2003). Accordingly, learning culture become variety, beyond face-to-face, go to online learning and blended learning. Within the digital environment, students join an online course to get materials, present their task, or do an exam without leaving their house. Moreover, the internet is beneficial to simplify school administration and to provide ease of school interaction with parents to supervise students (Pannen, 2014; Sekarasih, 2016).

Although the internet provides some advantages, teachers' role as a central figure in the learning process is still imperative. A teacher is a virtue personality, not just the source of materials. He/she can never be replaced by digital aids. So, they should have personality and character traits such as curiosity, enthusiasm, and compassion. In other words, all teachers must pass on a variety of social values within students (Mitchell et al., 2001). Consequently, all teachers are considered to represent the highest standard of self-character value, especially, to face the infiltration of technology into the education realm.

It is highly important to consider that the teacher's role in anticipating moral problems related to the use of technology is no less prominent than the ability to operate digital tools. Teachers are challenged to ensure that their students have skills and attitudes adequately to use technology appropriately. Regarding social problems in using technology, teachers' abilities to use technology personally must be accompanied by the mastery of digital citizenship. Digital citizenship is an appropriate framework that largely accepted to provide foundation to act appropriately in using technology. Ribble and Bailey (2006) state that pre-service teachers have to mastery digital citizenship to help them prepare for learning and educate students using technology appropriately. Thus, UNESCO (2015a) suggests integrating digital citizenship education into teacher competency standards and professional development programs.

To date, there is a few studies yet to be done in the Indonesia to investigate the pre-service teachers' readiness regarding digital citizenship. However, it is crucial to ensure that pre-service teachers have the awareness to use technology responsibly and have competencies to solve digital issues in their future class. Alqahtani (2017) stressed that digital citizenship is inextricably linked to contemporary issues, necessitating the preparation of student-teachers to respond wisely. It is intrinsically tied to the relationship between technological competence and characteristics of citizenship. While digital technology impacts a variety of dispositions, pre-service teachers should act as role models for citizenship (Kansu & Öksüz, 2019). In this context, teacher education institutions should offer a citizenship education program to help students develop their digital citizenship skills (Choi, Cristol, & Gimbert, 2018). It has been suggested that to develop digital citizenship, it is essential to provide appropriate instructions on becoming a good digital citizen. Therefore, this study concerns investigating knowledge, comprehension, perception, and application of

digital citizenship among pre-service teachers. Also, this research focuses on how to develop digital citizenship among pre-service teacher in Indonesia.

1.3. Problem Statement

Indonesia has struggled with some threats of technology use in educational settings, such as cybercrime, the massive distribution of pornography, plagiarism, and cyberbullying (Adiningrum, 2015; Paterson, 2019; Sulistyo & Manap, 2018). Teachers have a vital role to play in preparing students to have an awareness of the impact of the use of technology on human beings. In this context, digital citizenship is a necessity that must be realized by all teachers in order to equip students with the readiness to use technology responsibly and safely.

Nevertheless, previous studies found that most teachers are not adequately prepared and less trained to promote digital citizenship as well as responsibility for teaching digital competencies to students (Gazi, 2016; Hollandsworth et al., 2017; Ribble, 2012a). For instance, when students involve within cyberbullying and accessing pornographic websites, school principals and teachers prefer to restrict internet access and the use of mobile phones to solve digital threats without protecting student rights (Ruiz, 2019). To date, there is a lack of significant policies to provide provisions for teachers and students in dealing with these problems.

It is important to note that the readiness of teachers to advocate digital citizenship begins while they get training and education in the teacher education program. Prior studies stressed that teacher education institutions in USA, Turkey, Norway have started to realize the necessity of digital citizenship in the teacher

education curriculum (Instefjord & Munthe, 2016; Karaduman, 2017; Lindsey, 2015). However, literatures that explain how policies in teacher education reform in Indonesia response to the technological era are not abundant. Most studies focus on developing ICT capability enhancement to teachers (Djiwandono, 2019; Habibi et al., 2019; Putra et al., 2019), and the use of Learning Management System (LMS) or e-learning (Badaruddin et al., 2019; Rahman et al., 2019). Based on the National Education Standards, it just mentioned of providing equipment and infrastructure, including the learning resources needed to support online learning (Jalal et al., 2009).

In general, the development of digital citizenship for teachers is the main concern of scholars, especially in relation to their role in facing the digital generation (Ata & Yildirim, 2019; Hıdır Karaduman, 2017). As digital citizen, Curran (2012) stresses that pre-service teachers should be committed to making solutions to various problems from local to global levels in the online community while the provision of digital competencies to them will open-up opportunities to participate in civil discourse. Consequently, pre-service teachers education institutions should intend to provide a learning program to develop their digital citizenship competency (Choi, Cristol, & Gimbert, 2018).

Digital citizenship is not just about rules but also competencies to be able to show participation in the community both online and offline. Pre-service teachers should be able to make alternative solutions based on problem solving and how to be personally responsible in the use of technology. It would require the involvement of pre-service teachers in creating skills-based lessons regarding digital issues. Therefore, teacher education institutions are expected to be embedded in moral values to “lead with empathy and respect, to create solutions and be problem solvers, and value the participatory nature of digital citizenship” (Curran and Ribble, 2017, p. 36).

In the field of digital citizenship, prior research has largely focused on examining the level of digital citizenship and factors that affect digital citizenship. Based on Table 1.1, examples include demographic factors such as gender, school type, years of experiences, teaching subject, and academic qualifications of teachers to digital citizenship (Daher et al., 2022; Liu, 2021). Studies have also focused on influences of psychological factors on digital citizenship, for instance, internet self-efficacy, internet behavior, and internet attitudes (Liu, 2021), media literacy and digital literacy (Erdem et al., 2022), and teachers' belief (Daher et al., 2022). Different research highlighted digital citizenship campaign to be embedded on school curriculum (Capuno et al., 2022; Elmali et al., 2020; Lauricella et al., 2020; Florence Martin, Gezer, et al., 2020) while normative approach, as an example, digital storytelling with digital citizenship issues raise the literacy level of pre-service teachers (Cetin, 2021). However, in the studies above, a few studies have been conducted in relation to digital citizenship competency development, which indicates a need for more research, particularly on pre-service teachers for investigating digital citizenship understanding and how to teach digital citizenship.

Table 1.1

Prior Studies on Digital Citizenship Field

Author(s)	Method	Findings
(Florence Martin, Gezer, et al., 2020)	Mix-Method	Teachers' understanding increases after taking digital citizenship courses and promoting content into the curriculum and school environment.
(Elmali et al., 2020)	Mix-Method	The digital citizenship level in the Computer and Instructional teacher candidate group is higher than the pre-school teachers' candidate. They perceive digital citizenship as the principles of technology literacy, rights and responsibilities, and the moral ethics of using technology. This study recommends a digital citizenship course as an elective subject in schools and outside the school setting.
(Lauricella et al., 2020)	Survey	In the US, digital citizenship skills are taught in most kindergartens through fifth grade. The higher the grade, the more skills are taught. This study

Author(s)	Method	Findings
		also shows that teachers with more experience need more training time and that schools with mostly white students and schools in cities need to teach more skills.
(Liu, 2021)	Quantitative	Demographic factors such as gender, school type, and teaching subject have no significant effect on the level of digital citizenship among primary teachers in China. Other variables such as internet self-efficacy, internet behavior, and internet attitudes have a positive correlation with digital citizenship.
(Cetin, 2021)	Mix-Method	The use of digital storytelling with issues of digital citizenship increases the literacy level of pre-service teachers. Experience in creating digital storytelling helps them develop profession-specific skills such as technology, evaluation, and problem-solving skills.
(Erdem et al., 2022)	Quantitative	There is a positive relationship between media literacy, digital literacy, and digital citizenship among pre-service teachers in Turkey. The results illustrate that media literacy has a direct effect on digital literacy and digital citizenship. In addition, digital literacy is a mediator variable between media literacy and digital citizenship.
(Daher et al., 2022)	Quantitative	Among 153 teachers in Turkey, the mean score of schoolteachers' beliefs about their students' awareness is higher than the digital citizenship (DC) beliefs score. The results revealed that the factors of gender, academic qualification, and years of teaching experience did not have a significant impact on teachers' beliefs about the awareness of DC.
(Capuno et al., 2022)	Quantitative Descriptive	Schools need to help students improve their digital citizenship in terms of respect, educate, and protect sub-divisions. On the other hand, educators have a very good understanding of the three sub-divisions.

One learning strategy, which is expected to develop digital citizenship competency among pre-service teachers, is project-based learning. Literatures show that project-based learning was used to strengthen character education in schools (Sulistyarini et al., 2019; Trisiana, 2015), in particular for the pre-service citizenship education teachers (Komalasari, 2012; Trisiana, 2019). As an example, most educators employ a project citizen developed by the Center for Civic Education (CCE) to improve citizenship competence (Bentahar & O'Brien, 2019; Center for Civic

Education, 2012). Previous studies in citizenship education present project-based learning is an effective pedagogical tool for mastery learning materials and developing civic participation, self-creation, and improving critical thinking (Blevins et al., 2016; Mardiati & Leba, 2018; Marzuki & Basariah, 2017). With concern to engage students' autonomy in constructing their understanding of the digital world, project-based learning provides an opportunity for learners to advance and occur their digital skills through learning activities (Loizzo et al., 2016). Project-based learning has involved the development of 21st-century skills, including the concept of digital citizenship (Pongkitwitoon, 2017), by creating product regard to issues in a real-world context (Loizzo et al., 2018). In addition,

While the research is minimal in Indonesia, empirical studies advocate project-based learning to engage 21st century skills, including digital citizenship (Pongkitwitoon, 2017) through product-based activities related to real-world contexts (Loizzo et al., 2018). In a project-based approach, pre-service teachers would obtain motivation to seek information and validating, so that they become informed and active citizens. Improving digital skills is gained because project-based learning helps in constructing new knowledge, communication skills through interaction with peers, and involvement in active learning (Muñoz-Repiso et al., 2016). Frau-Meigs et al., (2017) state that trends of learning practices have transformed toward incorporating project-based and meaningful learning with digital tools that effect to digital citizenship education. Thomas (2000) argues that incorporating technology as a "cognitive tool" in PBL will help prospective teacher students gain meaningful experience during the knowledge construction process. Technology-based learning integration is believed to increase active participation to gain information and experience in collaborative projects (Bradley-Levine & Mosier, 2014). Therefore, Curran and Ribble (2017) suggest the use of project-based learning to develop digital citizenship competency

because it provides opportunities to apply active digital citizens so that this strategy can be considered as a digital leadership model.

In Indonesia, project-based learning to improve digital citizenship competency among pre-service teachers has not been extensively explored. This study is expected to provide some implications for educators, school principals, and policymakers in ensuring that youths access curricula at all grade levels for them to be able to show appropriate and responsible behavior in both online and offline environments. Therefore, it is necessary to do more research to investigate.

1.4. Objective of the Study

In general, this study aims to investigate the impact of project-based learning use as a strategy to raise digital citizenship competency among pre-service teachers. Ribble' work nine element of digital citizenship was used to assess the extent of pre-service teachers' understanding of digital citizenship. Additionally, the fieldwork is conducted at a citizenship education department through providing an instructional program to improve pre-service teachers' behavior in relation to navigating their digital world safely, responsibly, and ethically. In particular, this study is guided by some specific purposes as follow:

a. To investigate the pre-service teachers' understanding of digital citizenship.
b. To investigate pre-service teachers' perception toward project-based learning relates to citizenship courses.
c. To analyze pre-service teachers habituate digital citizenship in their daily life based on Ribble' work.

d. To evaluate the use of project-based learning in citizenship course improve digital citizenship competency among pre-service teachers based on Ribble' work.

1.5. Research Question

Based on some problems above, in order to generate as many ideas and concept in relation to investigate the digital citizenship competency among pre-service teachers, researcher proposes the research questions as follow:

a. What is pre-service teachers' knowledge and comprehension of digital citizenship based on Ribble' work?
b. What is pre-service teachers' perception of project-based learning use that relates to citizenship courses?
c. How do pre-service teachers habituate digital citizenship in their daily life based on Ribble' work?
d. How does the use of project-based learning in citizenship course improve digital citizenship competency among pre-service teachers based on Ribble' work?

1.6. Conceptual Framework of Research

Based on the research objectives, researcher attempted to investigate how the use of project-based learning impact to the digital citizenship competency among Indonesian pre-service teachers. Researcher proposes two conceptual frameworks: Nine elements of digital citizenship by Mike Ribble (2015) and project-based learning by John W. Thomas (2000). Researcher adapted PBL course design developed by the

Buch Institute for Education (BIE). The PBL method from BIE provides excerpted verbatim as a guideline of the implementation of PBL (Larmer et al., 2015). In Gold Standard PBL: Essential Project Design Elements, Larmer et al. (2015) arrange eight design elements that consist of key knowledge, understandings, and success skills; challenging problem or question; sustained inquiry; authenticity; student voice and choice; reflection; critique and revision; and public product.

Digital citizenship by Ribble was the established framework to solve the inappropriate use of technology. According to Walters (2018), it "provided a structure, as it has become the cornerstone to analyze and measure teacher perceptions regarding technology and teaching." (p. 13). Thus, many scholars adopted the framework to analyze and design educational curricula and policies to develop the readiness of students and teachers upon the use of technology. In this study, researcher uses research questions (RQ) 1 and 3 to frame references, established by determining what pre-service teachers know and experience about digital citizenship. Furthermore, the nine elements of digital citizenship framework relate to the challenge in the educational setting to help students and teachers to cover a set of skills on 21st-century work.

The central concept of digital citizenship will be grouped into two, namely core elements and specific-role elements. Researcher has a theoretical stand that moral problems in the use of technology that are the focus of this study need to be resolved by increasing the main competencies of understanding and awareness of citizenship literacy, moral ethics, and rights and responsibilities in the use of technology. Besides, this study has limitations to intervene in the provision of technology access, limited to the evaluation of the availability of infrastructure in relation to digital access. Specific-role elements describe the five elements of digital citizenship that have received wide

attention to be applied as competencies for digital citizens. The five specific-role elements relate to real-issues in educational settings, such as (a) impoliteness of students when communicating with teachers (digital communication); (b) unpreparedness of school principals to provide guidance (digital law); (c) engage in digital economic community safely (digital commerce); (d) students' capacity to protect personal data (digital security); and (e) anticipate the impact of technology to physical and mental health (digital health and welfare).

Thomas (2000) argues that incorporating technology as a “cognitive tool” in PBL would help students obtain meaningful experience during knowledge construction process. Technology may enhance authenticity when students gain information and experience within collaborative projects with those outside their classrooms (Bradley-Levine & Mosier, 2014). That would emphasize the "meaning" of acquiring knowledge, skills, and dispositions. Investigation using open-ended questions would influence students' curiosity and drive them to inquire and admit the problem. They work based on thinking and scientific work, such as understanding theory, conducting investigations, making analyzes, creating, and drawing innovative conclusions (Boss & Krauss, 2013). Accordingly, students have opportunities to learn in self-reliance and accountability because teachers may reduce external guidance (Moursund, 2003).

The main focus of PBL renewal is to integrate digital tools. Other researchers depict that IT tools will help students in building collaboration and teamwork in a complex project. IT tools can also be effective vehicles for delegating instructions from teachers to students (Krajcik & Shin, 2014; Ravitz & Blazevski, 2014). Reinventing PBL by utilizing learning technology will illustrate how the 21st-century project looks like. In addition, technological developments encourage students to develop thinking skills and open broader perspectives. Digital tools help in planning and improvement

projects, as well as reducing and eliminating obstacles encountered (Boss & Krauss, 2007). The use of digital tools can help students to investigate and develop new meanings (Boss & Krauss, 2013). PBL will give chances to students not only to achieve achievements in class but also to be part of a community of learners on a broader scale.

PBL framework from Thomas (2000) which explains the five criteria of PBL, namely a combination of centrality, driving questions, constructive investigation, autonomy, and realism, support to answer RQ 2 and 4. By employed PBL, pre-service teachers involved in content mastery process for understanding the central concept of digital citizenship. Thomas (2000, p. 3) says that "the project is the central teaching strategy" so that the project focuses on the struggle with ethical issues on using technology. Role-specific elements of digital citizenship are divided into several thematic units or topics that indicate the problem to be solved. The problem is a real-life challenge, not stimulated, so pre-service teachers are encouraged to collect data from outside experts. Project development begins with pre-service students driving questions which form the guidelines for all activities. They will struggle to make a bridge between conceptual knowledge and activities, especially in comparing multiple answers to construct their understanding.

In the context of this study, the lecturer must provide clear instructions and ensure that each pre-service teacher understands learning goals and stages of the project. Therefore, pre-service teachers have to make a plan. This includes the creation of working groups that can be based on the problems being studied. During the project completion process, pre-service teachers involve inquiry through gathering information individually and in groups. Each group can make rules for an agreement that is different from other groups. Each pre-service teacher can take and give ideas,

be involved in making decisions, propose and examine solutions, to present projects. The concept of knowledge in PBL is a student-driven inquiry, so the lecturer must encourage students to collaborate in teams, facilitate them to work together, and promote peer instruction, not covering all activities.

In relation to digital citizenship competency, under deliberative instruction being a component in PBL, the approach will lead to the development of 21st-century skills (Boss & Krauss, 2007). The integration between PBL and information technology (IT) is considered to provide an opportunity for students to develop IT knowledge and skills. Students back-to-back struggle to think about the design and running of projects in teams and individuals, so they engage in a collaborative process with their colleagues. They are asked to create innovative products which are considered as solutions to problems, as stated in the driving question. Especially, ISTE developed NETS Standards, which accommodate a number of 21st-century skills, such as creativity, innovation, collaboration, and communication. Also, promoting skills, such as technology operation and concept, which is well-known as an understanding of the concepts, systems, and operations of technology. NETS Standards also incorporate digital citizenship skills. Thus, students are expected to have an understanding related to human issues in using technology and practicing ethical behavior.

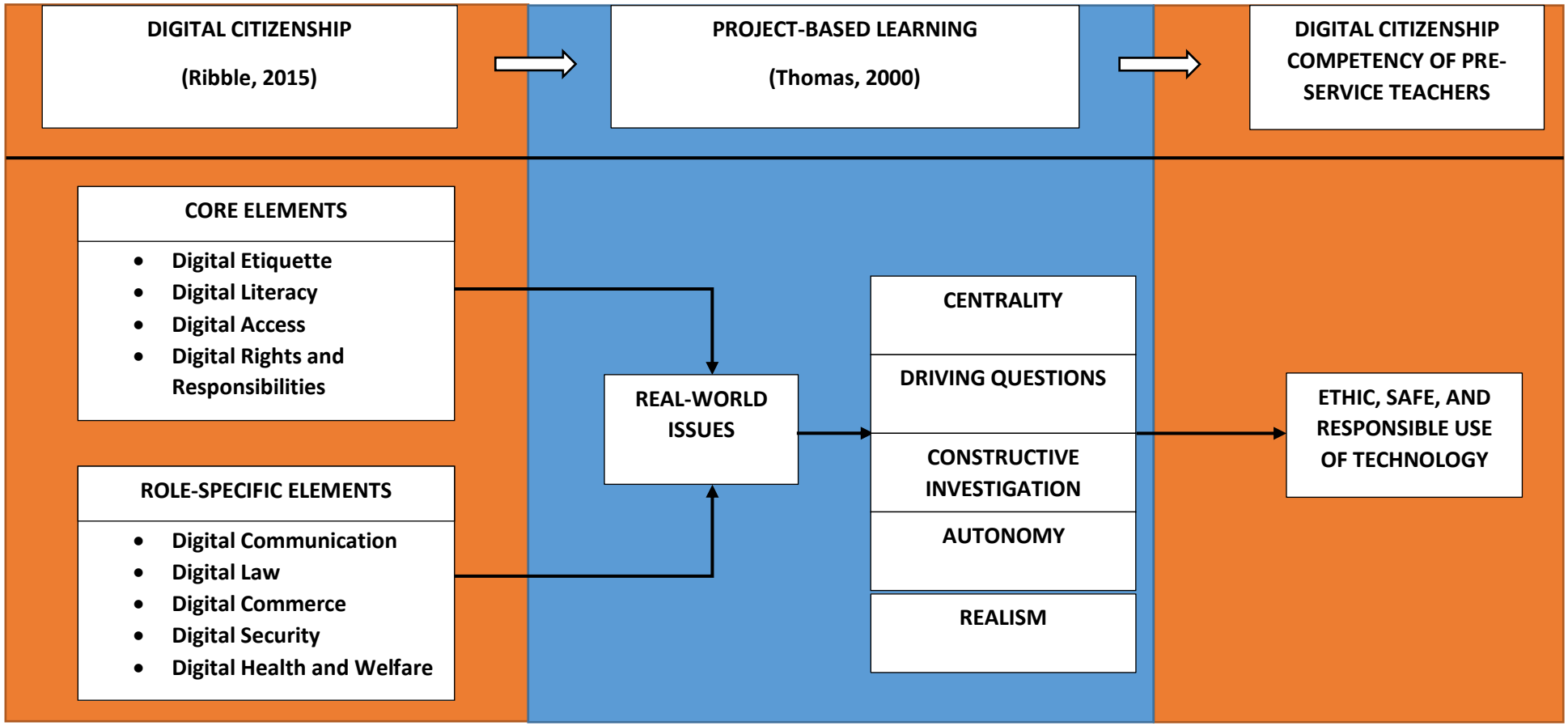
Boss and Krauss (2007) notion that PBL approach is suitable for acquiring knowledge and skills using technology. PBL provides opportunities to develop creativity, innovation, communication and collaboration skills, and other skills as described in the NETS standard. PBL could help bring the learning climate closer to real-life so that students will have a different experience than traditional learning. U.S. Department of Education (2017) recommends that digital media and technology integrate with PBL because the learning method engages students in a complex and

real-world challenge. This makes it possible for students to be able to improve critical thinking skills while dramatically increasing their digital skills.

Furthermore, PBL triggers a shift in the role of the teacher. The teacher provides flexibility and opportunity for students to build their understanding through inquiry. They may conduct investigative activities using open-ended questions in active learning and teamwork to create authentic products. Prior studies show that PBL is an effective method to strengthen learner behavior, in particular pre-service citizenship education teachers (Komalasari, 2012; Trisiana, 2019). Therefore, PBL may be considered to be able to change student behavior to use technology responsibly. The following explanation above, the framework for guiding this study as follows:

Figure 1.1

Conceptual Framework of Developing Digital Citizenship Competency through PBL



1.7. Operational Definition

Some following terminologies are used related to the purposed study. Several terminologies maybe have more than one single definition. Therefore, an explanation for each terminology as follows:

1.7.1. Pre-service Teacher

Chukwuemeka et al., (2019, p. 132) defines pre-service teachers as "a student teacher in training to become a teacher". Pre-service teachers have the same meaning with several other terms such as prospective teachers, practice teachers, and student teachers. To be able to become teachers, they are registered with the teacher education institutions and complete several compulsory teaching courses, including under supervision teaching practices (Mohammadi & Mortazavi, 2019). They are also taught and trained to be able to actually act teacher' professional competence, such as content knowledge, pedagogical content knowledge, and knowledge about learning and teaching in relate to subject matter. This will provide the variety of experience needed to develop teaching skills and evaluate the strengths and weaknesses of their teaching to be corrected as soon as possible. They completed a supervised professional experience teaching in school to be able to achieve a bachelor degree program. A senior school will mentor them as well as a supervisor from the teacher education institution to improve their understanding of the teaching process and how students learn in class. During school practice, they are challenged to operationalize theory into practice and confronting such dilemmas that surface in the classroom.

This study draws concetual inspiration from teacher education curriculum in Indonesia where has 374 teacher training institutions, 32 are public and 342 are private (UNESCO, 2015b). Pre-service teachers refers to student in teachers education institutions who have to complete a 4-year (Bachelor of Education). Due to Teacher and Lecturer Law, pre-service teachers have to hold Pendidikan Profesi Guru/PPG (the Postgraduate Professional Teacher Training Course), which is a requirement for obtaining certification (UNESCO, 2015b). The program aimed to develop teachers' professional competencies, including pedagogic, personal, social, and professional. The curriculum developed is dominant in teaching practice. Among the participants have to complete a 40% course on interactive and student-centered methodologies. 60% of the training portion will be spent on practical classroom work (Chang et al., 2013).

1.7.2. Digital Citizenship

The concept of digital citizenship emerged during the last few decades from experts who have sought to create a framework for the effective use of technology (Choi, 2016; Emejulu & McGregor, 2019; Hui & Campbell, 2018; Ribble, 2015). (Choi, 2016b) chose the view that digital citizenship cannot be separated from democratic life to foster involvement in public issues. A similar view was also taken by Buente (2015) and Ghosn-Chelala (2019) who interpreted digital citizenship as the ability to participate in online society, or more specifically in class struggle against social inclusion (Yue et al., 2019).

This study uses digital citizenship as a conceptual model from Mike Ribble (2015, p. 10) who describe digital citizenship as "Norms of appropriate, responsible

behavior with regard to technology use." He came out of an idea of digital citizenship that places important elements in the hands of students, teachers, parents and school principals in relation to the saturation of technology in life. Ribble pays attention to norms that are considered truth only because it is practiced by most technology users. The application of digital citizenship cannot be limited to schools but is needed by anyone when connected to the digital world. He states in the influential book "Digital Citizenship in School",

> Digital citizenship is about the changing nature of students and people in general with the rise of technology…. (for) helping others understand the topics and issues that surround them in this increasingly digital world and providing a foundation to act appropriately.
>
> (Mike Ribble, 2015, p. 8).

1.7.3. Digital Citizenship Competency

On the digital era, the roles and competencies of citizenship have a strong relationship with the skill of using technology. Allan (2011) defines competence as the ability and capacity of someone to be able to do something, and narrowing sense shows skills. Competence or competency describes a set of personal characteristics, in relation to the mastery of skills, knowledge, and attitudes that are owned and needed to do an activity based on a specific context (Sampson & Fytros, 2008; Semaan & Yamazaki, 2015).

In this study, digital citizenship competency is regarded as extending the range of digital citizenship to find information and interact with people digitally, but also it requires the skills to evaluate information and realize the consequences in a responsible way by utilizing digital tools to build civic engagement and solve problems

in physical or virtual communities (Hatlevik et al., 2015). Therefore, digital citizenship competency can be interpreted as a set of abilities needed by someone to be able to carry out activities in the context of the digital environment appropriately in order to maintain a balance between the lives of both online and offline. Furthermore, UNESCO (2015a, p. 3) promotes digital citizenship competency as "[a set of competencies] to use technologies in an ethical, safe, and responsible way without restricting users from fully participating in and contributing to the knowledge society."

1.7.4. Project-Based Learning

Project-based learning is well-known as one teaching approach to keeping students engaged in learning. By using this PBL, the abbreviation of project-based learning, students are challenged to dive into complex activities in relation to real-world issues. Basilotta Gómez-Pablos et al. (2017) views PBL as a strategy that provides opportunities for students to learn self-regulated and autonomously. For Chu et al. (2017), PBL is an approach that can present opportunities for multidimensional learning that cannot be offered by traditional instruction that is systematically-organized textbook. PBL as an approach oriented to how to arrange solutions to solve a real problem. The components in PBL include students' autonomy, constructive investigation, goal-setting, collaboration, communication, and reflection (Kokotsaki et al., 2016). For example, students will be involved in a real problem and then given the freedom to plan activities, find information using various sources, engage in debate, sharing and collaboration, make decisions, and make products / artifacts. Therefore, PBL arises from constructivist leaning theory which places learning activities as knowledge building based on experience.

According to Thomas (2000, p. 1), this study uses PBL as “a model that organizes learning around projects… that involve students in design, problem-solving, decision making, or investigative activities; give students the opportunity to work relatively autonomously over extended periods of time; and culminate in realistic products or presentations.” For him, PBL is not just a way to transfer material, but provides an authentic learner experience to gain new insights about a topic or problem.

1.8. Study Limitations

The study pays attention to the teaching and learning process that is received and implemented by pre-service teachers for developing digital citizenship competency. This study uses a qualitative approach to implementing the conceptual framework of digital citizenship from Mike Ribble. Twenty pre-service teachers was engaged who enrolled in the digital citizenship course.

This study applies the conceptual framework, which is the digital citizenship model from Ribble. Based on Ribble’ work, there are nine digital citizenship competencies, including digital etiquette, digital literacy, digital rights and responsibilities, digital access, digital communication, digital safety, digital law, digital commerce, and digital health and welfare. Following the established framework, the study focus on the development of digital citizenship competency among pre-service teachers through project-based learning.

1.9. Importance of Research

Education is essential to prepare future generations. Teachers must realize that educational product is students who will be a member of society. Thus, teaching and learning in the 21st century require fulfilling digital citizenship competencies (Ribble, 2012b; Searson, Hancock, Soheil, & Shepherd, 2015). This study provides an overview of digital citizenship competency among teachers as learners, instructors, and role models of appropriate behavior in using technology. Data sharing may result in understanding how to prepare pre-service teachers to engage and respond to the influence of technology in the whole of life.

Research on the readiness of pre-service teachers has paid attention to conduct (Afandi et al., 2019; Kansu & Öksüz, 2019; Shun Xu, Yang, MacLeod, et al., 2019b). Moreover, the development of proficiency of teachers' professionalism in mastering technology has been a concern in several previous studies (Banister & Vannatta Reinhart, 2012; Ciftci & Aladag, 2017; Hui & Campbell, 2018; Sincar, 2013). Teacher education institutions were not living in a vacuum but must be related to social change in society. Hence, transformation in the community must be adapted in teacher education. Related to the misuse and abuse of technology mentioned earlier, the provision of digital citizenship competency to teachers must be included in the teacher education curriculum. This study is expected to provide alternative efforts to be able to fill the research gap and contribute to the development of teacher professionalism through the integration of digital citizenship competency.

Scholars predict that global society will continue to change because of technological penetration in society (Graham & Dutton, 2019; Marshall, 2018; Miladi, 2016; Natarajan, 2017). The learning community must provide guidance and strategies

for students, teachers, and parents on how to respond and solve problems caused by the presence of technology (Ribble, 2015). They must promote awareness, respect, preparedness, and readiness through training and professional development to pre-service teachers. This study is intended to provide best practice on how digital citizenship is taught and used as experience. Thus, the results of this study may give significance to the development of moral education both theory and practice, especially how to improve the digital citizenship competency among pre-service teachers to navigate their digital world with regard to appropriate behavior.

1.10. Summary

Advancing technology has influenced humankind. Technology may provide benefits, but it raises a wave of ethical and moral problems, such as cyberbullying, plagiarism, digital theft, pornography, internet addiction, and so on. Accordingly, pre-service teachers should be aware and prepare to develop their competence in terms of the effects of technology related to teaching and learning culture in the 21st century. Mike Ribble (2015) proposes a conceptual framework to develop pre-service teachers' digital citizenship, namely nine elements of digital citizenship. The study investigates project-based learning to improve pre-service teachers' digital citizenship competency.

This chapter gives an explanation about this study, including the introduction, background research, problem statement, objective of the study, research question, the definition of terms, limitations of the study, and the importance of research.