A Qualitative Study on Digital Citizenship Education in Primary Schools

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Abstract
In recent years, the number of studies related to digital citizenship has increased amidst the intense use of digital media. The literature, rich in theoretical and empirical examples related to this topic, provides a clear picture of contemporary society. There is little empirical research on digital citizenship education in the early school years. Thus, through this investigation, we aimed to collect qualitative data on the development of specific digital competencies and digital citizenship in primary school students. Therefore, the authors considered it appropriate to use the observation method in its participatory version. Over a year, a group of 29 pupils, aged between 6 and 7, formed the sample to identify how they would develop digital competencies and digital citizenship in the context of formal and non-formal learning experiences. To collect the necessary information, we used the observation protocol, conducted in the form of open-ended questions described by Gay, Mills & Airasian (2006). The results of the study showed that parental educational attainment, family structure, time spent online, and the type of device have an important impact on the development of digital competencies and digital citizenship in young learners.

Keywords
Digital citizenship, Primary school, Qualitative study

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Introduction

The pace at which all fields of activity are transformed into the digital is accelerating, with the boundary between the virtual and the real gradually dissolving (Momanu, 2022). Younger people are attracted primarily by the novelty of digital content and by the increasingly appealing interface. They therefore spend a lot of time in front of screens, unaware of the dangers lurking in friendly forms. Considering this, there is a need to change the perspective on citizenship from territorial borders to the particular connections between each individual and the community materialized in the digital sphere (Božilović & Pavlović, 2021). Also, education in all its forms (formal, non-formal, and informal) must consider these changes in society (Momanu, 2022), and digital must be a recurrent element in most learning experiences offered to schoolchildren of all ages, including at primary level.

Digital citizenship is a broad concept, with its scope including related subtopics (Manzuoli et al., 2019), and research confirming through empirical data the extent of the phenomenon. Ribble (2014, p. 4) defines digital citizenship as “norms for responsible behavior about technology use”. The theoretical model developed by Ribble (2015) shows the need to develop digital citizenship competencies by referring to the nine dimensions: digital access, digital commerce, digital communication, digital ethics, digital literacy, digital health, digital justice, digital security, digital rights, and responsibilities. Digital access means the fair distribution of digital tools to all internet users, digital commerce aims to purchase goods or services securely, without the shopper becoming a victim of cyber predators (Ribble, 2015).

Digital communication involves the exchange of information in a digital context; Ribble refers to digital ethics that indicates the promotion of good citizenship and empathy with the use of digital tools (Ribble, 2015). Ribble speaks about developing digital competencies in working with technology as digital literacy (Ribble, 2015). Digital health is about ensuring optimal health when interacting with technology, and addressing physical and psychological well-being as Ribble says (2015). Digital justice requires compliance with rules and laws in the online environment. Ribble mentions the safety use of the internet in his model, totaling the existing measures in virtual environments. Internet users enjoy rights and have obligations, aspects mentioned in the theoretical model of digital citizenship (Ribble, 2015). In this context, teachers should guide students to know and enjoy the rights they have, but also to fulfill each of their related responsibilities (Ribble, 2015).

The need for digital citizenship education is becoming a topic of major interest, focusing on the formation of responsible digital citizens from an early age (Couldry et al, 2014). With this in mind, through the present research approach, we aimed to identify how digital and digital citizenship competencies develop in primary education under the influence of different factors through a qualitative investigation. This study aims to
investigate the influence of parents' level of education, time spent on the internet by children, type of device used, and family structure on the level of development of digital competencies and digital citizenship in primary school students. In the context of this investigative approach, we considered it appropriate to formulate questions and we intended to find explicit answers about digital competencies and digital citizenship:

1. To what extent does parents' level of education influence the development of pupils' digital citizenship competencies?
2. What impact does the time spent on the internet in a day have on digital and digital citizenship competencies development?
3. Is there a significant link between the type of device used to navigate the internet and the development of digital competencies and digital citizenship?
4. How does the family structure of each participating student influence the development of digital competencies and digital citizenship?

Through this investigative approach, we want to illustrate the current situation at the primary school level about digital citizenship education at a practical-applicative level. Through participatory observation, we want to find explicit answers to the questions formulated at the beginning of this research approach.

**Method**

**Participants**

The research method used in this investigation was observation in its participatory version, i.e. the primary school teacher who will deliver the digital education and digital citizenship lessons. Throughout a year-long study, a group of 29 students aged 6 to 7 (12 girls and 17 boys) formed the sample to identify how they would develop digital and digital citizenship competencies in the context of formal and non-formal learning experiences (James, Weinstein, & Mendoza, 2021). We accessed easily the participants' personal information about students' family structure due to the classroom teacher's involvement in the position of participant observer. Of the total number of participating students, sixteen came from families with both parents having a college degree (bachelor's, master's, or doctorate), ten students where only one of the two parents had a college degree, and only three from families with both parents having a middle or high school education. Considering the time spent on the internet, twenty-two say they spend an average of one hour a day on the internet, five pupils say they spend more than two hours a day online, and two children say they access a few minutes per week. In terms of the type of digital device used, twenty participating pupils say they use their smartphone to navigate the internet, seven use a tablet and only two use a laptop. Two of the total number of students participating in the study owned smartwatches. Regarding the family structure of the participating pupils, four
pupils are single parents, twenty children have only one sibling, three children come from families with three children, and two are from families with four children. These data on children are relevant in identifying the influences on the development of digital citizenship competencies for primary school students.

**Instruments**

The participant observer obtained the data on time spent in a day on the internet or digital devices in the form of learning games. The participant observer recorded the data in descriptive but also reflective form, explicitly delineated and called, “field notes” (Gay, Mills, Airasian, 2006, p. 382). Considering that the participant observer taught the digital literacy and digital citizenship classes, she recorded the data shortly after each lesson was completed. In addition, the observer collected data on the educational level of parents, the structure of students' families, and the related information based on discussions with adults/legal guardians.

The observer used an observation protocol, in the form of open-ended questions described by Gay, Mills & Airasian (2006, p. 385; see Table 1), to collect the necessary information. The participant observer recorded after each lesson all descriptive information and reflected on what she identified. She observed 29 students as a group and she recorded all behavioral displays, competencies, knowledge, and reactions, which helped in the content analysis. She did the observation throughout all the lessons, being at the same time a primary school teacher. She integrated digital tools into the teaching activity every day and in the context of an optional subject called "Navigators in the Technology Universe” taught weekly. She launched discussions about the effective use of online media and organized group and individual counseling hours with parents and students from which she obtained relevant data about children's activity on the internet (James, Weinstein, & Mendoza, 2021). She recorded all of this information in a short time after these learning experiences to ensure the completeness and accuracy of the data.

**Table 1. The Observation Protocol**

<table>
<thead>
<tr>
<th>Questions</th>
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<tbody>
<tr>
<td>What is the object of observation? How many students are involved?</td>
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<tr>
<td>What happens during the observation? What is the topic of discussion? What does each participant say, what does he do?</td>
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<td>What is the context in which the events unfold? How are arranged the students in the classroom? How do they interact?</td>
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<tr>
<td>What is the involvement of each participant? Who is involved? Who is interested?</td>
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<tr>
<td>What is the organization of the group? What are the participants’ attitudes and behavior?</td>
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<tr>
<td>What interactions seem unusual or significant?</td>
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<td>How does the activity end?</td>
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<tr>
<td>What did the observer do during the activity?</td>
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</table>
Procedure

At the outset of the study, the observer collected the parental consent for the inclusion of students in the research. The observer collected the data based on participatory observation from September 2022 to September 2023 by recording them in written form. The participant observer, a primary school teacher, recorded relevant data after each day of school in terms of the development of digital citizenship competencies, taking into account that students and teacher used digital tools in the classroom activity, as well as discussions about the use of online media. The observer did the participatory observation of the pupils included in the study within the specific primary school curriculum. Every school day, between 8:00 and 12:00, the primary school teacher and observer at the same time did with students’ activities of digital citizenship education in an interdisciplinary way, alongside those of the compulsory curriculum (Communication in Romanian, Mathematics and Environmental Exploration, Personal Development, Visual Arts, and Practical Competencies). The observer took notes after each individual or group counseling of pupils/parents in which she collected relevant information about the level of digital citizenship competencies of the children. These were organized both at the request of the observer in the role of teacher for primary education and at the request of pupils or their parents. After these discussions, the observer recorded all relevant data to capture the level of development of digital citizenship competencies for the children included in the study.

Results

We structured the qualitative data analysis according to the questions at the beginning of the investigation generating four relevant sub-themes (see Table 2).

<table>
<thead>
<tr>
<th>The research question</th>
<th>Dimension of analysis</th>
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<td>To what extent does parents’ level of education influence the development of pupils' digital citizenship competencies?</td>
<td>The influence of parents’ education level on the development of digital citizenship competencies to primary school students.</td>
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<td>What impact does the time spent on the internet in a day have on digital and digital citizenship competencies development?</td>
<td>The impact of the time spent on the internet in a day on the development of digital competencies and digital citizenship.</td>
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<tr>
<td>Is there a significant link between the type of device used to navigate the internet and the development of digital competencies and digital citizenship?</td>
<td>The connection between the types of devices used to navigate the internet and the development of digital competencies and digital citizenship.</td>
</tr>
<tr>
<td>How does the family structure of each participating student influence the development of digital competencies and digital citizenship?</td>
<td>The influence of the family structure of each participating student on the development of digital competencies and digital citizenship.</td>
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The influence of parents’ education level on the development of digital citizenship competencies to primary school students

In the development of digital citizenship competencies for pupils, a key element is the level of parental education. The educational level of adults is a determining factor, influencing the digital citizenship competencies of their children. In addition, given that, parents are responsible for their children's education, their own academic beliefs and experiences influence the educational path of their children.

Based on participatory observations and data received from the families of the pupils included in the study, the observer found that those schoolchildren whose parents have a university degree (Bachelor's, Master's, and/or PhD) have a higher level of digital citizenship competencies. Parents with higher education make a rational and balanced schedule of spending time in front of gadgets, installing apps to remotely track their children's activity, shopping online with their children, spending time together watching educational materials, and selecting together with their children the online content they watch. These parents are enrolling their children in robotics and computer clubs where they develop their digital competencies, but also learn about internet safety. In addition, parents with higher education more often request individual counseling to discuss their children's academic performance and are more involved in schoolwork, supporting the partnership with teachers. On the other hand, parents with only vocational or high school education give their children uncontrolled freedom, spend considerable amounts of time in front of gadgets, displaying behavioral disorders and social difficulties. These pupils find it difficult to adapt to the demands of the school environment and perform poorly at school. They often imitate behaviors pursued on various social networks, reaching verbal and physical violence (Kumar et al, 2017).

Parents of these students find it difficult to find time to discuss with teachers about their student's academic performance and are inconsistent in strengthening the school-family partnership. Children with insufficient parental support have low digital competencies, knowing only how to play various games on their smartphones, without being able to perform tasks with a higher level of complexity (manipulating the mouse, opening files, consciously watching educational videos, and following algorithms).

Thus, children whose parents have a university or postgraduate degree develop strong digital and digital citizenship competencies, with the family being more involved in the development of specific behaviors and competencies for young learners.
The impact of the time spent on the internet in a day on the development of digital competencies and digital citizenship

A key determinant in the development of digital competence and digital citizenship is the time spent on the internet by schoolchildren (Greenhow, 2010). Thus, we found an inverse relationship between the time spent by young schoolchildren on the internet each day and the development of digital citizenship competencies. The more time young children spend on the internet, the more they expose themselves to online dangers, without knowing how to protect themselves in the digital environment. They are also tempted to make online purchases without parental consent. They use inappropriate language both in cyberspace and in everyday life and become victims of cyberbullying. Children who spend more than two hours a day are aggressive, find it difficult to distinguish between virtual and physical environments, and have difficulties relating to other children and teachers (Weinstein, & James, 2022).

Children who spend an average of one hour a day online are more tolerant, can identify dangers on the internet and ask for adult help, make purchases only in the presence of and with the consent of their parents, browse online content only with parental approval and retrieve information from verified sources. They have good digital competencies, can solve tasks on the internet, and work through algorithms (coding games). They also know what can they do and not to do on the internet and identify those dangerous behaviors online. Children who spend only a few minutes a week on the internet have a higher level of motivation for learning and a greater interest in exploring different tasks involving the use of online tools and media. The observer notes that they have low digital competencies, need more time to understand online tasks, and have poor hand-eye coordination when solving applications with the mouse. They also find it difficult to identify appropriate behaviors in order not to become victims online. They tend to believe that online activity is all about entertainment, unaware of the dangers that may lurk.

On the other hand, we found out a direct connection between time spent online and the development of digital competencies, with pupils who spend more time online having higher digital competencies (Rideout & Robb, 2020). Thus, children who spend more than an hour a day using different devices know how to define different specific digital terms (laptop, tablet, mouse, internet, online apps, website, etc.), unlike those who use only a few minutes per week. Pupils who use the internet daily are dexterous in using digital devices, can access different files and applications, and are independent in integrating them into their daily work. They can complete tasks involving algorithm solving without adult support.
The connection between the types of devices used to navigate the internet and the development of digital competencies and digital citizenship

Another important factor in the development of digital competencies and digital citizenship is the type of device used to navigate the internet. Based on observations, we found that the gadgets used by students did not influence the development of digital citizenship competencies in young students. They make the same choices and exhibit similar behaviors whether using their phone, tablet, or smartwatch. The difference we noticed is when parents install different apps to control their children's internet activity. Thus, children whose parents track what their sons or daughters access are more tolerant of rules, accept the limits imposed, are more sociable, and are more aware of the dangers they may face online. They often ask for adult support when navigating the internet and openly accept parental advice.

Children whose activity is not tracked by parents through various apps are often engaged in dangerous situations, imitate aggressive online behaviors, and have difficulty accepting external boundaries imposed in the school environment (Robards & Lincoln, 2020). They socialize awkwardly encountering obstacles in interacting with children of the same age, and have difficulty accepting the rules of the school environment. They do not seek parental advice and access various online content without adult consent. However, we have noticed that schoolchildren who use smartphones are more dexterous in navigating the internet. The touch screen, its small size, and the lack of need to coordinate hand movements with the visualized material in comparison with the mouse make it quicker and more skillful for children to use the smartphone. Thus, the level of digital competencies is higher for pupils using this device as opposed to those using other gadgets. On the other hand, when children who predominantly use the phone try to use other types of digital devices (laptops, smart watches, etc.) they need constant adult support, without being able to transfer the acquired competencies effectively.

The influence of the family structure of each participating student on the development of digital competencies and digital citizenship

The family structure of each student participating in the study has a significant influence on the development of digital and digital citizenship competencies (Hinduja & Patchin, 2020). In terms of family structure, we observed that there is a significant influence on the development of digital citizenship competencies. Single child families benefit from increased parental support in the enabling use of digital devices. This is justified by the fact that parents devote all their time to a single child, as opposed to families with two or more children where their attention has to be in many directions. The parents in developing digital competencies and digital citizenship both through activities in collaboration with adults in the family and through participation in various
robotics and computer clubs support the pupils who do not have siblings. In this way, young children develop digital and digital citizenship competencies, which in turn boosts their self-esteem. Children with only one sibling tend to spend more time on the internet, and adults do not supervise them closely. If they have older siblings they access online content above their age level, influenced by family choices. If they have younger siblings, they tend to watch below-age content, maintaining a certain childishness in their general behavior. Students in families with three or four children do not have a routine for their use of digital media, their siblings or friends influencing their choices. They behave irresponsibly unaware of the dangers they are exposing themselves to. They also do not seek adult advice in the choices they make, often putting themselves at risk. All these manifestations in the online environment are also noticeable in schoolwork, as they are more restless and inconsistent, with no routine to support them in achieving their learning objectives.

Discussion

At the end of this study, which capitalized on participatory observation, the observer collected qualitative data that affirmed a gradual development of digital competencies and digital citizenship among primary school students. The school activities illustrated digital citizenship and subsumed dimensions at a practical level by reference to primary education. The level of education of the parents or legal guardians, the structure of the family, the time spent on the internet, and the type of device that the children use to navigate the online environments influences the digital and digital citizenship competencies of primary school students. Regarding the education level of the parents, following participatory observations, we found that there is a direct connection between the education level of adults and the development of digital citizenship competencies in primary school students. Parents with higher education tend to be more involved in the formation of responsible behaviors in the online environment by children in primary school. Parents keep a close watch on the activity of the little ones. They spend time together with the children watching educational materials on the internet, installing applications with the help of which they monitor what the little ones do when they navigate alone, and encouraging schoolchildren to participate in computer science or robotics clubs where they go through content related to cyber security.

On the other hand, parents with secondary or high school education give their children total freedom without setting clear boundaries, which makes children develop aggressive behavior both online and in social interaction in everyday life. These children are involved frequently in conflict situations generated by the lack of awareness of their actions and a lack of guidance provided by adults (Smith, 2020). In their absence, the development of responsible behaviors, specific to a good digital citizen, is impossible, an aspect illustrated based on the results obtained from the collected data. Thus, digital citizenship has taken a much more practical form, as the development of specific competencies for safe internet browsing of young students. On the other
hand, at a practical level, the obtained results are significant for proposing concrete solutions to current education problems. We see the need to diversify learning experiences, both formal and non-formal, in the context of early schooling for students to develop specific competencies (James, Weinstein, & Mendoza, 2019). In addition, there is a need for learning activities that leverage the school-family partnership for the development of digital citizenship competencies.

Regarding the influence of the amount of time spent on the internet in a day, following observations we found that those children who spend more than two hours a day expose themselves more to dangers on the internet, are tempted to make purchases online without adult support and develop the most aggressive behaviors. On the other hand, they have better digital competencies than children who spend less than an hour a day or those who navigate the internet only a few minutes per week. We found the best results for children who spend about an hour on the internet every day, watching educational materials, having a well-established schedule, and a supervised activity through online applications. These children know how to avoid online dangers by asking adults for help, make online purchases only in their presence and with the consent of their parents, have good and very good digital competencies, and manage to solve tasks involving work algorithms given in exercises of coding. As for children who only have access to the internet for a few minutes each week, they have an optimal level of motivation for learning. They are interested in tasks involving the use of online tools, but they need constant support from an adult in solving simple tasks on the internet (opening the device, some pages on the internet, moving the cursor, etc.). In addition, they have difficulties defining simple digital terms and show a withdrawn attitude when the discussions during the didactic activities mainly focus on the digital component of education.

The type of device used to navigate the internet is another defining element in the development of digital competencies. Following the observations, we found that the students who use smartphones to navigate the internet show greater dexterity in accessing different online content, showing increased digital competencies. However, they have difficulties when they change the type of gadget, not being able to have the same performance as with the smartphone. Regarding the level of development of digital citizenship competencies depending on the type of device used, we did not find any change in the manifestation of behaviors specific to a good digital citizen. Regardless of the gadget time used, children show similar behaviors regarding the safe and effective use of online environments.

Family structure is an important aspect of the development of digital competencies and digital citizenship. As the number of children in a family increases, the care of parents decreases, because of their divided attention. Thus, the little ones take on the models of their brothers and sisters, exposing themselves to dangers and accessing content that is not appropriate for their age. They either watch videos below their age level if they
have younger siblings or those that require a higher degree of maturity, which causes them to develop inappropriate behaviors. As the number of children in a family decreases, the support offered by parents in developing responsible behaviors on the internet, specific to a good digital citizen, increases. Adults have more time to guide students to make positive choices in the digital environment, with children gaining a sense of confidence and increased self-esteem in using online tools. Single-child families are more involved in the student digital and digital citizenship competencies development, with the child participating in different IT or robotics clubs, spending more time with their parents in the digital environment, watching educational video materials together, and better respecting a daily routine for accessing applications.

Conclusion

At the end of this qualitative investigation, we can conclude that this approach shows the importance of different factors in the development of competencies necessary for the training of future generations. Digital citizenship is a primary aspect for all internet users, especially against the background of the intensification of the use of digital tools. In addition, with the lowering of the age level from which children start using digital tools, it becomes essential to train specific behaviors so that the little ones know how to protect themselves from the dangers that appear in the use of online environments. Education for digital citizenship must thus start from an early age so that the premises of a "healthy" society of the future can be formed (Verduyn et al., 2017).

In this created context, the qualitative approach that we undertook showed the importance of factors such as the level of education of the parents, the structure of the family of origin, the time spent on the internet, or the type of device used are the aspects whose influence was analyzed. The results of the research are important against the background of the need to ensure a quality education by the requirements of today's society, but especially of the future. Limitations of the study are the large quantity of data to be collected, the relatively small sample, and the chronologic and energy-consuming aspects of the qualitative method used.

Recommendations

Regarding future research possibilities, we propose investigating the influence of factors such as the type of applications used by children, the field of work in which parents are active, or aspects regarding the structure of the family of origin (the gender of the other children in the family) on the development of digital competencies and digital citizenship in primary school students. We also propose to investigate the influence of these factors on a sample of middle school or high school students.
References


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