Empowering Educators: The Critical Role of Teacher Education Programs in Advancing Digital Literacy Skills

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ABSTRACT

The increasing prevalence of digital technologies in the 21st-century classroom necessitates a critical examination of teacher education's role in improving digital literacy (DL). This study examines the role of teacher education in improving digital literacy (DL) among pre-service teachers (PSTs). Using a social constructivist framework, a case study approach was conducted with three PSTs from a technology integration course at a land grant university. Semi-structured interviews were analyzed, revealing four themes: concerns, challenges, advantages, and future decisions regarding DL. While PSTs recognize the importance and benefits of DL, they face significant challenges, including ethical and legal issues, and lack confidence in using DL tools. The study highlights the need for comprehensive teacher education programs to better prepare PSTs for integrating digital technologies in their future classrooms. This research offers strategies for teacher educators to enhance DL among PSTs, promoting a digitally literate teaching force. Future studies should involve larger samples to generalize findings and further explore the impact of DL education.

Keywords:
 Pre-service teachers, Digital Literacy, Teacher education

Background for the Study

Using technology in the classroom has become essential in 21st century education [1] Teachers should be supported on the front lines in utilizing and educating students in the use of technology and must use digital literacy (DL) techniques to help students learn how to solve problems in digital environments [2]. Without teachers who are knowledgeable about technology, it cannot be used effectively in the classroom. Regardless of the increasing interest in DL, many teachers feel unprepared to effectively assist their students with DL skills [2].

Guiding Research Questions

What is the current level of DL in pre-service teachers (PSTs) considering the progress of the modern world and today's technology?

Conceptual/Theoretical Framework

To investigate the research question, this study utilized a case study approach guided by a social constructivist framework to understand how the participants' knowledge of DL develops through their coursework. Also, it enables me to position myself in the research and rely as much as possible on the participant's views [3].

Delimitations and Limitations

This research investigates the role of teacher education in improving PSTs' DL and will not address teaching methods and the impact they may have nor will it consider students' backgrounds or different DL contexts.

Definition of Digital Literacy

Digital literacy: DL, or new media literacies, refers to the creation and interpretation of meaning through digital media [4].

Significance of the Study

Despite growing interest in DL, many teachers feel unprepared to effectively support students in developing DL skills [2]. We can support their personal learning and development by teaching PSTs how to integrate DL into the PK-12 classroom and engaging them through DL practices. This study can enable teacher educators to prepare some strategies to develop DL for PSTs.

Review of Related Literature

These days, there are many different text formats students may encounter in the digital environment [5]. Screen-based text formats have grown more popular than paper-based texts [6]. Thus, it is necessary to create new literacies to adapt from print to digital texts.

Digital Literacy and Technology

The term "literacy in the 21st century" is frequently used to describe DL [7]. [8] defines DL as the capability to access information in digital form. [9] claimed that because technology is present in every aspect of life, DL is inevitable.

Teachers and students who want to be fully literate must comprehend the ability to use these technologies. The best option is to use them in addition to the resources teachers already have [10]. Having a quality professional teacher development program is crucial for developing a high-quality teaching force. As a result, the developmental program must include technology integration in the classroom [7].

Students and Teachers Attitudes of DL

The widespread availability of technology has brought people in general, and students in particular, to spend an increasing amount of time accessing digital tools [11]. Students are interested in learning and using digital tools in their personal lives. So, they must be able to read digital texts due to the frequency and variety of information in the digital world [12]. Studies conducted by [13], [14], and [10] support the idea that students are more motivated to read digital texts than printed texts and have a positive view of digital texts.

Also, research conducted by [15], [12], and [16] showed teachers' positive attitudes toward the use of DL. Digital texts have fundamentally altered reading and students' behavior while reading [14], and students are sometimes better at using specific applications than their teachers [12]. To give students the best education to be proficient readers and help them to be able to manage and filter the information they receive, teachers must be proficient in DL and can build proficiency by gaining more experience through attendance at regular workshops or courses on teaching reading digital texts [4, 12, 14, 17] .

Conclusion

Digital technologies had become widespread. Students are more likely to use digital text and have a positive view of using digital tools in schools and at home [10, 13, 14]. Also, teachers believe that DL is important to their classes and they have a good attitude toward using it as well [12, 15, 16]. But some teachers still feel uncomfortable using and teaching DL in their classrooms. In addition, students sometimes outperform teachers when it comes to controlling and being creative with digital technology [4, 12]. So, teachers need to learn how to use DL in classes and how to engage students more with it.

Methodology

I utilized a bounded case study which allowed me to choose students from two different sections of a single course offered at a land grant university in the northwestern U.S.

Sampling Procedures:

Participants were three preservice teachers from a technology integration course at a land grant university in the northwestern US. Participants from this course were selected due to the course's focus on DL.

Data Collection Strategy:

Participants engaged in semi-structured, recorded one-on-one interviews with the researcher. Interviews were then transcribed verbatim.

Data Analysis Strategies:

I choose the Novice approach because "for novices, data analysis may be the most mysterious aspect of qualitative research" [18, pp. 105]. This foundational model consists of four iterative cycles: The Inspection Cycle, Coding Cycle, Categorization Cycle, and Modeling Cycle [18]. I transcribed the interviews and find the initial codes from significant words and phrases. After organizing each code into the tables, I created some categories and placed each code in one of them, then chose the most important ones as themes.

To be sure about the validity of data analysis, I take out my biases as a teacher, use more than one participant's view to find common conceptions, and organize codes and themes to find the constructs. I invited

two professors to check my coding process to add credibility to the developed themes. Moreover, I asked for some insights about the student's experiences with DL from the course instructor. To achieve dependability, I try to make sure that the research process is logical, traceable, and documented [19]. I recorded the participant's voices and transcribed them verbatim.

Findings:

The following themes emerged from the interviews with the participants: a) Concerns, b) Considering challenges, c) Advantages, and d) Future decisions. In the following section, themes are delineated and sample quotes from participants are presented.

a) Concerns

This section addresses sub-themes such as ethics, legality, and appropriateness of using DL in teaching. The participants spoke about the concerns they have about using digital tools such as safety, privacy laws, and copyrights. Wyatt, a pre-service teacher, said: *A lot of things that I taught were totally ok to do, are not. I watched a video of people who got in trouble with the people who owned materials. I thought if you were using the material for education purposes is pretty much ok. You should use what won't get you in trouble. It's also about both copyright and privacy perspectives too. Once I get good at them, I think I will be very comfortable. Right now, I am uncomfortable finding good copyright for pictures to use in lessons, and getting good support materials would be my biggest concern.*

Katherine answers the questions "How comfortable are you in incorporating DL into your future classes? What concerns, if any might pose a challenge in incorporating DL? ": *I am 75% comfortable but also a little scared. I want to make sure I am using the Digital resources correctly because I have a responsibility as an educator, and I just want to make sure that I am fulfilling this responsibility ethically.*

Teachers may encounter obstacles that prevent them from using technology effectively, such as a lack of confidence or proficiency, nervousness while introducing new technologies, and lack of time for professional development that supports instructors [20, 21]. Participants in this study indicated similar concerns regarding using DL in their future classrooms.

b) Challenges

One of the important factors when considering using digital tools is the challenges teachers and PSTs face. Many PSTs lack information and knowledge of DL [22], making it difficult for them to implement effective DL curricula.

In this section, some sub-themes such as the meaning of DL, fluency of DL, inappropriate use, and support are addressed. Wyatt sees challenges as having more than one definition of DL due to the quickly evolving digital world, requiring him to do more research on available technologies. Katherine believes: *I think it can pose a challenge if it's not used in a way that pushes students to do their own work and make sure they are actually using all their skill sets and not just depending on the technology. I just think there is a lot of pushback I might receive from the administration and parents.*

c) Advantages

The interviewees are aware of DL's advantages. PSTs often have a positive attitude regarding adoption of DL and think it is crucial for their students [23]. Sub-themes addressed in this section are proficiency, technology culture, and DL across the curriculum.

Katherine stated: *That is super helpful. I want to include DL in my classroom as much as possible because we are a constantly evolving generation right now. To be an effective teacher you need to have a good understanding of it.*

d) Future decisions

The purpose of having a digital-related course is first to teach PSTs about what DL is and support their understanding of the ethical and legal issues around finding, evaluating, and using information. So, it is important to know about students' decisions regarding how to use DL in class in the future. Wyatt shared about his decisions: *I'll definitely give my students the same things I was given in this class.* Future instructional decision-making of PSTs is influenced by experiences in their educator preparation programs [24].

Conclusion

In analyzing the participants' responses, the four themes were: a) Concerns: concerns pre-service

teachers have to use DL in their classrooms., b) Considering challenges: the obstacles they face in using digital tools c) Advantages: the positive perspective of using DL, d) Future decisions: the student's decision of using DL in their classrooms in the future.

Discussion

This study aims to improve the understanding of the current level of DL in PSTs. DL is the capacity to find reliable information and navigate online activities wisely and safely [25]. Results show participants are thinking about the challenges and responsibilities of their student's safety and privacy.

In addition, participants are not confident about their ability to engage their future students with DL. Although it is crucial to integrate technology in the classroom, their lack of confidence will create challenges for both teachers and students. Therefore, they need to receive training that will equip them to instruct pupils utilizing DL. Teachers must be digitally literate to provide students with the skills and information they will need to succeed in a technologically dominated world [26].

Additional areas for research are apparent. While the study described is qualitative in scope, large-scale studies of pre-service teachers in DL are also required to present a generalizable picture of their experiences. Future research should examine students' skills in working with digital tools and examine different technology-related courses' productivity.

The small sample size leads to limitations. While many of the findings from this study mirror earlier research, these findings cannot be generalized to all students. Universities and policymakers should rethink technology-related courses that engage students more. This seems like an ongoing process in which continual teacher development will be needed as technology changes and new DLs are available.

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