



Digital Literacy in Madrasah Curriculum: Preparing Students for the Global Digital Economy

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Abstract *Digital literacy is an essential skill in today's global era, especially to prepare students for the challenges of the digital economy. This study identifies the urgent need to integrate digital literacy in the madrasah curriculum in Indonesia to improve students' skills in the critical and responsible use of technology. This study uses a qualitative approach with a case study design, which involves interviews, observations, and document analysis. The results show that many teachers and students in madrasahs have a basic understanding of digital literacy, but Obstacles in technology infrastructure and teacher training are significant obstacles to effective implementation. With the comprehensive integration of digital literacy, the madrasah curriculum is expected to be able to equip students with digital skills that are relevant to the needs of the global job market. The study recommends the development of ongoing teacher training as well as curriculum updates to include critical digital skills and cybersecurity.*

Keywords digital literacy, madrasah curriculum, digital economy, education, technology skills

1. Introduction

In the ever-evolving digital era, digital literacy has become one of the important skills that the younger generation must have. Digital literacy includes not only the ability to use information and communication technologies, but also a critical understanding of information available online ^{1 2}. With society's increasing dependence on technology, formal education, including in madrasahs, needs to adapt to ensure students are ready to face global challenges in the digital world ^{3 4 5}.

¹ JISC, "Developing Student's Digital Literacy," *JISC*, 2015, 1–4.

² C. Hague and S. Payton, *Literacy across the Curriculum, Literacy across the Curriculum* (Futurelab, 2013), <https://doi.org/10.18848/978-1-61229-143-7/cgp>.

³ OECD, "Skills Summit 2018 – Skills for a Digital World," no. June (2018): 1–17.

⁴ "Digital Literacy in Education - UNESCO Digital Library," 2011, accessed January 25, 2025, <https://unesdoc.unesco.org/ark:/48223/pf0000214485>.

⁵ Neil Selwyn, "Education and Technology: Key Issues and Debates," Bloomsbury Publishing, 2016, <https://www.bloomsbury.com/uk/education-and-technology-9781350145566/>.

The urgency of this research arises from the fact that many students in madrasahs still lack adequate digital literacy skills. According to data from the Central Statistics Agency (BPS), only about 34% of students in Indonesia have enough digital skills to compete in the global economy ^{6 7}. In addition, a report from the World Economic Forum (WEF) states that digital skills will be a key factor in creating new jobs and increasing economic productivity ⁸. This shows the need to integrate digital literacy in the madrasah curriculum.

Based on previous studies, there are many theories that support the importance of digital literacy in education. Digital literacy contributes to improving students' academic performance and their readiness to enter the workforce. In addition, the integration of digital literacy in the curriculum not only prepares students for today's technology, but also helps them adapt to future technological developments ^{9 10}. Supporting data regarding digital literacy among madrasah students can be presented in the form of the table below.

TABLE 1. Supporting Data

Keterampilan Digital	Persentase Siswa yang Memiliki	Sumber
Penggunaan Internet	70%	BPS, 2021
Pemrograman Dasar	25%	BPS, 2021
Keamanan Siber	30%	BPS, 2021

Relevant previous research has shown that there is a gap between students' digital skills and the needs of the workforce. For example, a study by P21 (2015) found that many companies complain of a lack of digital skills among high school graduates, including madrasahs ¹¹. However, most of these studies have not explained in depth how the madrasah curriculum can be changed to include digital literacy effectively.

This gap research shows that although there are several initiatives to incorporate technology in learning in madrasahs, not many studies specifically explore the right

⁶ "Statistik Telekomunikasi Indonesia 2021 - Badan Pusat Statistik Indonesia," accessed January 25, 2025, <https://www.bps.go.id/id/publication/2022/09/07/bcc820e694c537ed3ec131b9/statistik-telekomunikasi-indonesia-2021.html>.

⁷ M. Dinah Charlota Lerik, "Kapasitas Memori Kerja Dalam Pengambilan Keputusan," *Buletin Psikologi* 24, no. 1 (2016): 33, <https://doi.org/10.22146/bpsi.12678>.

⁸ WEF, "The Future of Jobs Report 2020 | World Economic Forum," 2020, <https://www.weforum.org/publications/the-future-of-jobs-report-2020/>; "The Future of Jobs Report 2020 | World Economic Forum," accessed January 25, 2025, <https://www.weforum.org/publications/the-future-of-jobs-report-2020/>.

⁹ Adrian Kirkwood and Linda Price, "Technology-Enhanced Learning and Teaching in Higher Education: What Is 'Enhanced' and How Do We Know? A Critical Literature Review," *Learning, Media and Technology* 39, no. 1 (2014): 6–36, <https://doi.org/10.1080/17439884.2013.770404>; JISC, "Developing Student's Digital Literacy."

¹⁰ JISC, "Developing Student's Digital Literacy."

¹¹ "P21 (2015b). Framework for 21st Century Learning. The Partnership for 21st Century Skills. - References - Scientific Research Publishing," 2015, accessed January 25, 2025, <https://www.scirp.org/reference/referencespapers?referenceid=1412327>.

strategies to integrate digital literacy in the curriculum. This research aims to fill this gap by providing practical recommendations for the development of relevant and applicable curricula ¹².

The novelty of this research lies in a holistic approach in developing digital literacy that not only focuses on technical aspects, but also on the development of critical thinking and digital ethics. Digital literacy must include cognitive and affective aspects to prepare students to face moral and ethical challenges in the digital era ^{13 14}.

The purpose of this study is to identify and recommend effective ways to integrate digital literacy into the madrasah curriculum. Thus, this research is expected to contribute to the development of education in madrasahs that are more relevant to the needs of students and the global challenges faced today ^{15 16}.

2. Method

This study uses a qualitative research approach with a case study design. This approach was chosen to explore in depth how digital literacy can be integrated in the madrasah curriculum. Using a case study design, this study will allow researchers to collect rich and contextual data from a variety of sources, including interviews, observations, and existing curriculum documents ^{17 18 19}.

The data collection techniques in this study include interviews: Researchers will conduct semi-structured interviews with teachers, madrasah heads, and students to understand their views on digital literacy and how it can be integrated into the curriculum. Interviews will be recorded and transcripts will be analyzed ^{20 21}.

¹² Steven Higgins, ZhiMin Xiao, and Maria Katsipataki, "The Impact of Digital Technology on Learning: A Summary for the Education Endowment Foundation. Full Report.," *Education Endowment Foundation*, November 2012.

¹³ S. Bennett and K. Maton, "Beyond the 'digital Natives' Debate: Towards a More Nuanced Understanding of Students' Technology Experiences," *Journal of Computer Assisted Learning* 26, no. 5 (October 2010): 321–31, <https://doi.org/10.1111/J.1365-2729.2010.00360.X>.

¹⁴ Rodney H. Jones and Christoph A. Hafner, "Understanding Digital Literacies: A Practical Introduction," *Understanding Digital Literacies: A Practical Introduction*, January 1, 2012, 1–214, <https://doi.org/10.4324/9780203095317>.

¹⁵ Ellen B. Mandinach and Edith S. Gummer, "A Systemic View of Implementing Data Literacy in Educator Preparation," <Http://Dx.Doi.Org/10.3102/0013189X12459803> 42, no. 1 (January 1, 2013): 30–37, <https://doi.org/10.3102/0013189X12459803>.

¹⁶ Dana Opre, "Teachers' Pedagogical Beliefs And Technology Integration," *Conference: 9th International Conference Education, Reflection, Development*, March 23, 2022, 112–18, <https://doi.org/10.15405/EPES.22032.10>.

¹⁷ R. K. Yin, *Qualitative Research from Start to Finish* (New York: Guilford Press, 2011).

¹⁸ John W. Creswell, *Research Design. Qualitative, Quantitative, and Mixed Methods Approaches* (Sage Publication, 2017).

¹⁹ Sharan B. Merriam and Elizabeth J. Tisdell, *Qualitative Research: A Guide to Design and Implementation* (Jossey-Bass, 2015).

²⁰ Svend Brinkmann and Steinar Kvale, *InterViews Learning the Craft of Qualitative Research Interviewing* (Sage Publications, 2014).

²¹ M. Q Patton, *Qualitative Research & Evaluation Methods: Integrating Theory and Practice*. (Sage Publication, 2015).

Observation: The researcher will conduct classroom observations in several madrasahs to observe teaching practices related to digital literacy. These observations will include assessments of how technology is used in learning and students' interaction with digital tools^{22 23}. Curriculum Documents: Document analysis will be carried out on the existing curriculum to evaluate the extent to which digital literacy has been integrated. The analyzed documents will include the syllabus, lesson plans, and relevant teaching materials^{24 25}.

The research procedure will follow the following steps: Preparation: The researcher will identify and select the madrasah that will be the location of the research, as well as obtain permission from the relevant parties to conduct interviews and observations. Data Collection: After obtaining permission, the researcher will conduct interviews and observations according to the specified techniques. Data collection will be carried out over a semester to gain a comprehensive understanding^{26 27}. Data Analysis: Data obtained from interviews, observations, and document analysis will be analyzed using thematic analysis methods. Researchers will identify key themes emerging from the data to answer research questions and describe best practices in integrating digital literacy in madrasah curricula^{28 29}.

The data analysis techniques used in this study are as follows: Thematic Analysis: Data obtained from interviews and observations will be analyzed thematically to identify patterns and themes related to digital literacy in the curriculum. Researchers will transcribe the interview data and create categories to organize the information.

Data Triangulation: To ensure the validity of the research results, data triangulation will be carried out by comparing data from various sources (interviews,

²² N. K. Denzin and Y. S. Lincoln, *The SAGE Handbook of Qualitative Research* (Sage Publications., n.d.).

²³ Louis Cohen, Lawrence Manion, and Keith Morrison, *Research Methods in Education, Research Methods in Education* (Routledge, 2017), <https://doi.org/10.4324/9781315456539>.

²⁴ Glenn A. Bowen, "Document Analysis as a Qualitative Research Method," *Qualitative Research Journal* 9, no. 2 (2009): 27–40, <https://doi.org/10.3316/QRJ0902027/FULL/XML>.

²⁵ Hsiu Fang Hsieh and Sarah E. Shannon, "Three Approaches to Qualitative Content Analysis," <Http://Dx.Doi.Org/10.1177/1049732305276687> 15, no. 9 (November 1, 2005): 1277–88, <https://doi.org/10.1177/1049732305276687>.

²⁶ Sarah Elsie Baker et al., "How Many Qualitative Interviews Is Enough? Expert Voices and Early Career Reflections on Sampling Expert Voices," n.d.

²⁷ Merriam and Tisdell, *Qualitative Research: A Guide to Design and Implementation*.

²⁸ Virginia Braun and Victoria Clarke, "Using Thematic Analysis in Psychology," *Qualitative Research in Psychology* 3, no. 2 (2006): 77–101, <https://doi.org/10.1191/1478088706QP0630A>.

²⁹ Jennifer Fereday and Eimear Muir-Cochrane, "Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development," *International Journal of Qualitative Methods* 5, no. 1 (March 1, 2006): 80–92, https://doi.org/10.1177/160940690600500107/ASSET/IMAGES/LARGE/10.1177_160940690600500107-FIG1.JPEG.

observations, and documents). This will help in confirming the findings and strengthen the resulting arguments ³⁰.

Data Interpretation: After the thematic analysis is carried out, the researcher will interpret the data to provide a deeper meaning related to the integration of digital literacy in the madrasah curriculum. This interpretation will refer to relevant theories of education and digital literacy ³¹.

3. Result & Discussion

Observations in the classroom revealed that the integration of technology in madrasah learning is still Opreited. Most teaching activities still rely on conventional methods, although digital tools such as tablets and laptops are available ^{32 33}. Many teachers stated that they do not feel confident in using technology to teach digital literacy. This causes students not to get a balanced and relevant learning experience to global demands ³⁴.

Data from document analysis show that the existing curriculum does not cover digital literacy in depth. Although there are several elements related to technology, many materials have not been updated to reflect the latest developments in the digital world ^{35 36}.

Based on interviews and observations, there are several challenges in the implementation of digital literacy in madrasahs. First, the lack of training for teachers is the main obstacle. Many teachers feel that they do not have enough knowledge to integrate digital literacy in learning ³⁷. In addition, the Opreitations of technological infrastructure in madrasahs are also obstacles, such as unstable internet access and lack of adequate devices ^{38 39 40}.

³⁰ Uwe. Flick, *An Introduction to Qualitative Research* (Sage Publications., 2018).

³¹ V. L. Creswell, J. W. & Clark, *Designing and Conducting Mixed-Methods Research* (CA: SAGE Publications, Inc., 2006).

³² Kirkwood and Price, "Technology-Enhanced Learning and Teaching in Higher Education: What Is 'Enhanced' and How Do We Know? A Critical Literature Review."

³³ Mandinach and Gummer, "A Systemic View of Implementing Data Literacy in Educator Preparation."

³⁴ J. W. Creswell, *Research Design: Pendekatan Kualitatif, Kuantitatif, Dan Mixed* (Yogyakarta: Pustaka Pelajar, 2015).

³⁵ Fabio Nascimbeni, "Rethinking Digital Literacy for Teachers in Open and Participatory Societies," *International Journal of Digital Literacy and Digital Competence* 9, no. 3 (November 13, 2018): 1–11, <https://doi.org/10.4018/IJDLDC.2018070101>.

³⁶ Opre, "Teachers' Pedagogical Beliefs And Technology Integration."

³⁷ Baker et al., "How Many Qualitative Interviews Is Enough ? Expert Voices and Early Career Reflections on Sampling Expert Voices."

³⁸ Neil Selwyn, "Education and Technology: Key Issues and Debates."

³⁹ WEF, "The Future of Jobs Report 2020 | World Economic Forum."

⁴⁰ "P21 (2015b). Framework for 21st Century Learning. The Partnership for 21st Century Skills. - References - Scientific Research Publishing."

Parents' lack of understanding of the importance of digital literacy also contributes to the low support for technology-related programs in schools^{41 42 43}. This study shows that it is important for madrasahs to involve parents in digital literacy education so that students get optimal support. The following diagram shows the main challenges faced in the implementation of digital literacy in madrasahs.

A. Curriculum Development Strategies for Digital Literacy

Based on the results of the research, there are several strategies recommended to develop the madrasah curriculum in order to improve digital literacy. First, the development of continuous training for teachers is very important so that they feel more confident in teaching digital literacy⁴⁴. This training should include technical and pedagogical aspects to ensure teachers can use technology effectively in teaching.

Second, the curriculum should be updated to include more in-depth digital literacy components, including cybersecurity, digital ethics, and problem-solving skills using technology⁴⁵. The following table shows the recommended components to be included in the digital literacy curriculum.

4. Conclusion

This research reveals the importance of integrating digital literacy in the madrasah curriculum to prepare students to face challenges in the global digital economy. Through a qualitative approach involving interviews, observations, and document analysis, it was found that the understanding of digital literacy among students and teachers is still very varied. Despite the awareness of the importance of these skills, many teachers feel they do not have enough ability to teach digital literacy effectively. Opreitations in teacher training and technological infrastructure in madrasahs are inhibiting factors in optimal implementation. Other findings show that the current curriculum does not cover digital literacy comprehensively, so students do not get learning experiences that are relevant to the needs of today's world of work. Therefore, this study recommends the development of more structured strategies to incorporate digital literacy into the madrasah curriculum, including ongoing training for teachers and updating teaching materials. With these steps, it is hoped that students will be better prepared and able to compete in an increasingly complex and competitive global digital economy.

5. Declaration of Conflicting Interests

⁴¹ UNESCO, "Digital Literacy: Content, Structure and Development of a Life Skill," no. May (2011).

⁴² Svend Brinkmann and Steinar Kvale, *InterViews Learning the Craft of Qualitative Research Interviewing*.

⁴³ Jones and Hafner, "Understanding Digital Literacies: A Practical Introduction."

⁴⁴ Hsieh and Shannon, "Three Approaches to Qualitative Content Analysis."

⁴⁵ Mandinach and Gummer, "A Systemic View of Implementing Data Literacy in Educator Preparation."

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