

Teacher's Strategies For Integrating 21 st Century Competencies Into Elementary School Instruction At Muhammadiyah 01 Elementary School In Tanggul Jember

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ABSTRACT

This study aims to analyze teachers' strategies for integrating 21st-century competencies, the forms of their application in learning activities, and the relationship between planning, implementation, and assessment at SD Muhammadiyah 01 Tanggul Jember. The study employed a qualitative approach using a case study design. Data were collected through observation, in-depth interviews, documentation, and a review of instructional materials, and were then analyzed using an interactive analysis model that included data condensation, data presentation, and the drawing and verification of conclusions. The findings indicate that the integration of 21st-century competencies is realized through information analysis, discussions, group work, product creation, presentations, and reflection. Javanese language learning materials and co-curricular activities demonstrate the interconnection between fostering creativity, communication, collaboration, the use of technology, and process- and product-based assessment. The main findings of this study confirm that the integration of 21st-century competencies cannot be achieved merely by including indicators in learning materials; rather, it requires coherence among learning objectives, task design, collaborative activities, the production of works, the communication of results, and assessment.

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1. INTRODUCTION

The rapid transformation of social life, digital technology, and workplace demands has shifted the orientation of elementary education from knowledge acquisition toward the meaningful application of knowledge. Within this transformation, 21st-century competencies particularly critical thinking, creativity, communication, and collaboration (4Cs) have become essential for preparing students to navigate complex and open-ended problems. Elementary education represents a critical stage for cultivating these competencies because students require sustained opportunities to explore problems, exchange ideas, collaborate, make decisions, and reflect on their learning.

This orientation is consistent with the Merdeka Curriculum, which emphasizes student-centered, contextual, differentiated, and project-based learning while strengthening both character and competencies. Accordingly, the integration of 21st-century competencies should be understood not merely as the adoption of digital technologies or innovative instructional models, but as a transformation of teachers' pedagogical practices and their capacity to design meaningful learning experiences (Chun & Abdullah, 2022). Previous studies have documented various efforts to integrate 21st-century competencies into elementary education. Surya, Sayekti, and Ali (2022) found that 21st-century skills had been incorporated into curriculum implementation in Islamic elementary schools, although teachers continued to encounter implementation challenges.

Similarly, Sundari et al. reported that elementary teaching practices increasingly promote higher order thinking and 4C skills, but their implementation remains inconsistent due to variations in teachers' conceptual understanding. Other studies have highlighted diagnostic assessment, differentiated instruction, technology integration, project-based learning, and teachers' facilitative roles as important mechanisms for developing these competencies. Teacher perceptions and attitudes have also been identified as relevant factors, although positive perceptions do not necessarily result in consistent classroom practices (Utami, Padmadewi, Artini, & Dewi, 2021).

At the international level, Chun and Abdullah (2022) further demonstrated that the development of 21st-century skills is shaped not only by teachers' attitudes and pedagogical knowledge but also by school-level conditions and institutional support. Despite this growing body of research, an important gap remains in understanding how teachers strategically translate the concept of 21st-century competencies into everyday pedagogical practices. Much previous research has examined the effectiveness of particular instructional models, such as discovery learning, STEM, or digital learning, with greater emphasis on students' competency outcomes than on teachers' pedagogical decision-making processes (Putra, Wiyanto, & Linuwih, 2020; Zainil, Kenedi, Padang, Indrawati, & Handrianto, 2023).

Qualitative studies have also tended to examine teachers' roles, perceptions, or curriculum implementation separately, rather than examining the interconnected relationship among teachers' understanding, lesson planning, classroom interaction, learning resources, technology use, and assessment. This gap is particularly relevant in Muhammadiyah elementary schools, where the development of academic and digital competencies intersects with an educational mission emphasizing character formation, Islamic values, and social responsibility. Against this background, the present study examines teachers' strategies for integrating 21st-century competencies into elementary school instruction at SD Muhammadiyah 01 Tanggul Jember.

Rather than evaluating a single instructional model, the study investigates how teachers interpret 21st-century competencies, translate them into instructional planning and classroom practices, and adapt learning activities to students' characteristics and the institutional context. The study positions teacher strategy as a multidimensional pedagogical process encompassing instructional design, classroom interaction, technology and learning-resource utilization, assessment, and contextual adaptation. Its novelty lies in integrating these dimensions within a single analytical perspective while situating 21st-century competency development within the distinctive educational context of Muhammadiyah schooling. Such an approach provides a more contextualized understanding of how global competency demands are negotiated within local educational practices. Accordingly, this qualitative study aims to analyze how teachers at SD Muhammadiyah 01 Tanggul Jember integrate critical thinking, creativity, communication, and collaboration into elementary learning.

2. METHODS

This study employed a qualitative approach with a case study design to examine how elementary school teachers integrate 21st-century competencies into classroom instruction within the natural context of SD Muhammadiyah 01 Tanggul Jember. The case study was selected to enable an in-depth and contextualized examination of teachers' interpretations, pedagogical decisions, instructional practices, and experiences in integrating critical thinking, creativity, communication, and collaboration (4Cs), while considering the influence of school policies, student characteristics, learning resources, institutional support, and the broader educational environment (Creswell & Poth, 2018; Chun & Abdullah, 2022). Participants were selected purposively based on their direct involvement in planning and implementing classroom instruction, while data were collected through semi-structured interviews, classroom observations, and document analysis involving lesson plans, teaching modules, assessment instruments, learning materials, and relevant school documents. Interviews explored teachers' understanding of 21st-century competencies, instructional planning, pedagogical strategies, technology use, assessment practices, and perceived supporting and constraining factors, whereas classroom observations examined the enactment of these competencies through classroom interaction, collaborative activities, problem-solving, questioning, student participation, and opportunities for creativity and communication. Data were analyzed thematically through an iterative process involving data familiarization, initial coding, categorization, identification and refinement of themes, and interpretation across multiple data sources, with both deductive attention to the 4Cs and inductive consideration of themes emerging from the field. Triangulation across interviews, observations, and documents was employed to strengthen the credibility of the findings, while member checking and an audit trail were used, where applicable, to support the dependability and confirmability of the interpretations. Ethical procedures included institutional permission, informed consent, voluntary participation, confidentiality, anonymization of participants, and secure handling of research data. The analysis ultimately focused on identifying patterns in teachers' pedagogical strategies, the ways in which 21st-century competencies were embedded in everyday learning practices, and the contextual factors that supported or constrained their implementation.

3. FINDINGS AND DISCUSSION

3.1. The Construction of 21st-Century Competencies in Instructional Planning

The results of the data analysis indicate that the integration of 21st-century competencies into learning at SD Muhammadiyah 01 Tanggul Jember is beginning to take shape through learning activities that provide students with opportunities to analyze information, produce work, express ideas, and engage in collaborative activities. Documentary findings reveal that critical thinking, creativity, communication, and collaboration are not treated as standalone objectives but are beginning to be integrated into learning objectives, student activities, learning products, and assessments. This pattern is particularly evident in the sixth-grade learning documents, which guide students toward literacy activities, discussions, creative projects, presentations, and reflection.

The learning documents show that 21st-century competencies have been translated into learning outcomes and active learning activities. In Phase C Javanese language instruction, for example, students are guided to analyze information, identify main ideas and values in texts, and present ideas, observations, and experiences in a logical, systematic, creative, and critical manner. A similar pattern is also evident in the Grade 6 Annual Program, which explicitly includes the ability to convey information, generate ideas creatively, and present observations as part of the learning outcomes. These findings indicate that the integration of 21st-century

competencies at the planning stage goes beyond merely listing the term “21st-century skills”; rather, it begins to translate these concepts into activities that require students to process information and generate responses. Thus, instructional planning serves as an initial platform for teachers to link academic objectives with the development of thinking and communication skills

3.2. Integrating Critical Thinking and Creativity through the Production of Works

The next theme highlights learning strategies that combine thinking activities with the creation of works. The LENTERA Grade 6 Co-curricular Module document includes objectives to understand digital literacy, identify hoaxes, apply digital ethics, create digital posters, and present the final works. This series of activities is carried out through digital literacy lessons, discussions on digital ethics and hoaxes, the creation of digital posters using Canva, followed by presentations and an exhibition of the works. In this approach, students not only receive information about digital technology but are also guided to evaluate information and use it to create products. The activity of identifying hoaxes provides an opportunity for information processing, while creating digital posters fosters creativity in selecting and organizing messages. The products are then presented, so the learning process moves from understanding information to creating works and communicating the results. This approach demonstrates the interconnection between critical thinking, creativity, and communication within a single learning sequence.

3.3. Communication and Collaboration as Learning Practices

The integration of communication and collaboration is evident through discussion, presentations, and group work activities designed for co-curricular learning. The sixth-grade module on patriotism and independence, for example, employs a project-based and collaborative learning model. The designed activities include discussions, poster-making, reenactments of the struggle for independence, group project presentations, and reflections. Assessment also covers student participation in discussions and presentations, as well as the outcomes of their projects and work. These findings indicate that communication is not merely defined as the ability to speak in front of the class but is embedded within a series of processes as students discuss, create works, work together, and present project outcomes. Collaboration also emerges as an integral part of the process of jointly producing . Thus, there is a connection between teachers’ strategies in assigning project-based tasks and the opportunities provided for students to interact, share roles, express ideas, and complete tasks collaboratively.

The integration of 21st-century competencies is also reflected in the forms of assessment used. In the LENTERA Module, assessment includes diagnostic and formative assessments through observation and products, as well as summative assessments through posters and presentations. The assessment rubric specifically includes creativity, communication, collaboration, and the use of technology. This demonstrates that 21st-century skills are increasingly being incorporated as part of the assessment criteria, rather than merely as an additional outcome of learning activities. Overall, the documentary data reveal a pattern of strategies that link planning, learning activities, products, presentations, and assessments. The primary support evident in the documents is the availability of learning materials that explicitly provide space for creativity, communication, collaboration, the use of technology, and critical thinking skills.

The research findings indicate that 21st-century competencies are positioned as an integrated part of the learning process, rather than as additional skills separate from mastery of the subject matter. This is reflected in the statement by a sixth-grade teacher who emphasized that students are not only guided to understand the learning material but are also given the

space to express their opinions and produce their own work. This statement indicates a learning orientation that provides students with opportunities to develop communication skills, creativity, and active engagement in the learning process. These interview findings are further supported by observational data showing student engagement in group discussions and presentations of their work.

This pattern is also evident in the sixth-grade learning documents, which explicitly include discussion activities, project creation, and presentations. In the LENTERA module, for example, students are guided to understand digital literacy, identify hoaxes, create digital posters, and present their work. The document also lists creativity, communication, collaboration, and the use of technology as aspects assessed in the learning process. Thus, the integration of 21st-century competencies in the research context is evident through the provision of learning experiences that enable students not only to receive information but also to process information, produce works, collaborate, and communicate their learning outcomes. This finding aligns with the Javanese Language Learning Outcomes for Phase C at SD Muhammadiyah 01 Tanggul, which directs students' to present ideas, experiences, and observations logically, creatively, and critically

DISCUSSION

The findings indicate that the integration of 21st-century competencies at SD Muhammadiyah 01 Tanggul Jember is not positioned as an additional component separate from subject content but is embedded within instructional design, student activities, learning products, and assessment. Planning documents demonstrate the inclusion of analysis, idea presentation, project development, discussion, collaboration, presentation, and reflection. This suggests that 21st-century competencies are constructed as part of the learning experience rather than merely added as administrative indicators. From a constructivist perspective, such practices provide students with opportunities to construct meaning, test ideas, interact with peers, and produce representations of knowledge.

Accordingly, competencies such as critical thinking, creativity, communication, and collaboration acquire pedagogical meaning when translated into authentic learning activities rather than simply stated in learning objectives. This finding supports Pardede (2020), who argues that the 4Cs should be integrated into the learning process rather than taught as isolated skills. Thus, the teachers' strategies at SD Muhammadiyah 01 Tanggul Jember reflect a shift from content transmission toward learning experiences that simultaneously develop knowledge and competencies. A prominent finding concerns the integration of critical thinking and creativity through activities requiring students to analyze information and produce original work.

In Phase C Javanese language learning, for example, students are expected to analyze facts, procedures, main ideas, and values contained in texts while expressing ideas, experiences, and observations logically, creatively, and critically (Tanggul, 2026a). Similarly, the LENTERA co-curricular activities connect digital literacy, identification of hoaxes, and digital ethics with the production and presentation of digital posters, while assessment rubrics explicitly address creativity, communication, collaboration, and technology use (Tanggul, 2026b). These practices demonstrate that the 4Cs are translated into subject-specific learning processes rather than treated as generic educational labels.

Nevertheless, the presence of discussion, presentation, or project activities should not automatically be interpreted as evidence of optimal competency development. Discussions may be dominated by particular students, while product-oriented tasks may demonstrate creativity only at the artifact level without necessarily requiring creative thinking. Therefore, the integration of 21st-century competencies needs to be examined as a pedagogical continuum encompassing task design,

questioning, student decision-making, interaction, and assessment. This finding extends previous research, which has emphasized the importance of instructional planning and learning activities in developing the 4Cs (Alifah & Sukartono, 2023).

Collaboration represents another important dimension of the findings. The co-curricular module Love for the Homeland and Independence employs project-based activities involving group discussions, poster creation, drama, group presentations, and reflection (Tanggul, 2026c). In this structure, collaboration functions simultaneously as a learning mechanism and as a competency to be developed. Students are provided with opportunities to distribute responsibilities, negotiate ideas, produce collective work, communicate outcomes, and reflect on their experiences. This finding is consistent with Surya et al. (2022), who reported that 21st-century competencies can be integrated comprehensively through elementary learning activities, although implementation remains subject to various challenges.

Importantly, the findings across Javanese language learning and co-curricular activities indicate that 21st-century competencies are not confined to isolated classroom practices but appear across different components of the school's instructional ecosystem. This suggests that teachers' strategies are potentially shaped by broader curricular and institutional conditions rather than being solely individual initiatives. School leadership, curriculum support, learning resources, teacher collaboration, and available instructional time may therefore influence the sustainability and consistency of 4C integration. Assessment also emerges as a strategic component of competency integration. In the LENTERA module, assessment incorporates observation, projects, posters, and presentations, supported by rubrics addressing creativity, communication, collaboration, and technology use (Tanggul, 2026b).

This indicates an orientation toward authentic assessment in which students are evaluated not only on their ability to reproduce knowledge but also on their ability to apply knowledge in meaningful contexts. Such alignment is important because a discrepancy between instructional activities and assessment may weaken the development of targeted competencies. For example, collaborative and creative learning activities followed exclusively by conventional written tests would provide limited evidence of students' communication, creativity, or collaboration. Conversely, assessment of products, processes, communication, and collaborative performance creates greater coherence between learning objectives, instructional experiences, and evidence of learning. However, the findings also demonstrate that integrating the 4Cs does not imply reducing the importance of content knowledge.

Critical thinking requires substantive knowledge as the basis for analysis, creativity requires conceptual understanding, communication requires meaningful content, and collaboration requires shared academic purposes. The Javanese language learning sequence illustrates this integration by connecting text analysis, interpretation of values, expression of ideas, and text production within a coherent competency-oriented learning process (Tanggul, 2026a). At the conceptual level, these findings suggest that 21st-century competencies are better understood as a coherent pedagogical chain connecting curriculum orientation, task design, knowledge construction, social interaction, product creation, communication, reflection, and assessment. Operationally, the findings indicate that the development of the 4Cs does not depend exclusively on a particular instructional model. Project-based learning, discussion, presentation, digital production, collaborative activities, and authentic assessment can function as vehicles for developing these competencies when they are deliberately designed to require analysis, choice, interaction, creation, and communication.

This perspective extends previous research that often conceptualizes the 4Cs primarily as individual student attributes by demonstrating that their development is also shaped by pedagogical and institutional arrangements. The findings further reinforce the importance of teacher understanding, instructional materials, professional development, institutional leadership,

and alignment between curriculum, classroom practices, and assessment. Consequently, strengthening 21st-century competencies requires more than short-term teacher training; it requires sustained institutional support and coherence across the learning system. The practical significance of the findings lies in the need to develop a more explicit school-level framework for integrating the 4Cs beyond their inclusion as indicators in teaching modules.

Teachers need support in designing learning tasks that require students to analyze information, generate alternatives, make decisions, collaborate, communicate outcomes, and reflect on their learning. Curriculum teams and school leaders can strengthen this process by facilitating teacher collaboration and reviewing instructional materials and assessment practices according to the quality of students' learning experiences. Nevertheless, the presence of such instructional designs should not be interpreted as conclusive evidence that students have fully mastered the 4Cs, because the implementation of planned activities does not necessarily correspond directly to students' actual competency development. The central contribution of this study is therefore not the claim that 21st-century learning has been fully achieved at SD Muhammadiyah 01 Tanggul Jember, but the identification of how 21st-century competencies are constructed and operationalized through concrete pedagogical practices. The findings provide a basis for further investigation into how teachers interpret the 4Cs, how these strategies are negotiated in classroom interactions, and what contextual factors enable, modify, or constrain their implementation within Muhammadiyah elementary education.

4. CONCLUSION

This study concludes that the integration of 21st-century competencies at SD Muhammadiyah 01 Tanggul Jember is constructed as an integral component of the learning process rather than as an additional set of competency indicators. Teachers operationalize critical thinking, creativity, communication, and collaboration through analytical tasks, discussions, project-based activities, digital product development, presentations, reflection, and authentic assessment. The findings demonstrate that the effectiveness of 4C integration depends not merely on the presence of particular instructional activities but on how learning tasks are designed to require students to analyze information, generate ideas, make decisions, interact collaboratively, communicate outcomes, and reflect on their learning. The study further reveals that the integration of these competencies is influenced by the alignment among curriculum, instructional planning, classroom practices, learning resources, assessment, and institutional support. Therefore, 21st-century competencies should be understood as both pedagogical and institutional constructs that require coherence across the broader learning ecosystem. However, the existence of competency-oriented instructional designs should not be interpreted as definitive evidence of students' mastery of the 4Cs, indicating the need for further research that directly examines students' experiences and competency development. Overall, this study contributes a contextualized understanding of how teachers in Muhammadiyah elementary education translate the 4Cs from conceptual curriculum demands into concrete learning experiences and provides implications for sustained teacher development, collaborative instructional planning, and the alignment of learning and assessment practices to support meaningful 21st-century education.

REFERENCES

- Alifah, L., & Sukartono. (2023). Integration of 21st century skills in thematic learning in elementary school. *Jurnal Ilmiah Sekolah Dasar*, 7 (1), 168–175. <https://doi.org/10.23887/jisd.v7i1.55050>

- Chun, T. C., & Abdullah, M. N. L. Y. (2022). Contemporary practices in teaching 21st-century skills at Malaysian primary schools: Do environmental factors and teachers' attitudes matter? *Asia Pacific Journal of Educators and Education*, 37 (1). <https://doi.org/10.21315/apjee2022.37.1.4>
- Creswell, J. W., & Poth, C. N. (2018). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches* (4th ed.). SAGE Publications.
- Creswell, John W. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). SAGE Publications.
- Herlinawati, H. (2024). The integration of 21st-century skills in the education curriculum. **Heliyon**, 10 (15), e35148. <https://doi.org/10.1016/j.heliyon.2024.e35148>
- Noptario, N., Rizki, N., Nur'aini, N., & Ningrum, E. C. (2024). The role of teachers in the Merdeka Curriculum: Efforts to strengthen students' 21st-century skills in elementary school. *Ideguru: Journal of Teachers' Scientific Works*, 9 (2), 656–663. <https://doi.org/10.51169/ideguru.v9i2.813>
- Pardede, P. (2020). Integrating the 4Cs into EFL integrated skills learning. *Journal of English Teaching*, 6(1), 71–85.
- Putra, M. D., Wiyanto, W., & Linuwih, S. (2020). The effect of discovery learning on 21st-century skills for elementary school students. *Journal of Primary Education*, 9 (2), 201–208. <https://doi.org/10.15294/jpe.v9i2.37349>
- Sukirwan, S., Ratnaningsih, N., Patmawati, H., & Suhaya, S. (2024). 4-Cs: Teachers' efforts to foster 21st-century skills in teaching and learning. *Journal of Authentic Research on Mathematics Education*, 6 (1), 1–12. <https://doi.org/10.37058/jarme.v6i1.9079>
- Surya, K. A., Sayekti, I. C., & Ali, S. R. B. (2022). Analysis of the implementation of 21st-century skills based on the 2013 curriculum at the elementary level. *Profesi Pendidikan Dasar*, 9(1), 93–106. <https://doi.org/10.23917/ppd.v9i1.16293>
- Tanggul, S. D. M. 01. (2026b). *LENTERA (Digital Literacy and Technology for Adolescents) Co-curricular Teaching Module, Phase C, 6th Grade, 2026/2027 School Year*.
- Tanggul, S. D. M. 01. (2026c). *Co-curricular Module for Grade 6, Phase C, Second Semester: Love for the Homeland and Independence*.
- Utami, L. P. R. A., Padmadewi, N. N., Artini, L. P., & Dewi, N. L. P. E. S. (2021). Teachers' perceived attitudes toward the implementation of 21st-century skills in elementary school. *International Journal of Language and Literature*, 5 (1), 1. <https://doi.org/10.23887/ijll.v5i1.27667>
- Zainil, M., Kenedi, A. K., Padang, R., Indrawati, T., & Handrianto, C. (2023). The influence of a STEM-based digital classroom learning model and high-order thinking skills on the 21st-century skills of elementary school students in Indonesia. *Journal of Education and E-Learning Research*, 10 (1). <https://doi.org/10.20448/jeelr.v10i1.4336>
- Arifin, S., Umiarso, U., Muthohirin, N., & Fuad, A. N. (2025). The Dimensions of Leadership in Strengthening and Institutionalising Religious Moderation in Muhammadiyah. *Legality: Jurnal Ilmiah Hukum*, 33(1), 69–92. <https://doi.org/10.22219/ljih.v33i1.37219>
- Fanani, A., Hamzani, A. I., Khasanah, N., & Sofanudin, A. (2021). Muhammadiyah's manhaj tarjih: An evolution of a modernist approach to islamic jurisprudence in indonesia. *HTS Teologiese Studies / Theological Studies*, 77(4). <https://doi.org/10.4102/HTS.V77I4.6942>

Franklin, N. J. (2020). Islam and the Dutch in the East Indies: Oppression or Opportunity? *European Legacy*, 25(5), 572–587. <https://doi.org/10.1080/10848770.2020.1760467>

?

Mahzumi, F., Aminuddin, A., Mahfudh, H., & Sm, M. M. (2025). CYBER-ISLAMIC MODERATION IN INDONESIA: Digital Activism of Islami.co and IBTimes.id and Its Implications for Young Muslims. *Miqot: Jurnal Ilmu-Ilmu Keislaman*, 49(1), 22–49. <https://doi.org/10.30821/miqot.v49i1.1290>

Rahmaniah, A., Susanti, E., Hendrarti, D. W. B., & Sari, U. A. (2025). The Movement Of Muhammadiyah Women: Religious Values, Culture, And Gender Equality. *Jurnal Ilmiah Peuradeun*, 13(1), 669–694. <https://doi.org/10.26811/peuradeun.v13i1.1089>

Rusli, M., & Nusi, A. (2025). Doctrinal Compromise: Flexibility of Conceptual Landscape among Nahdliyin and Muhammadiyah Members in Gorontalo, Indonesia. *Mankind Quarterly*, 65(4), 400–414. <https://doi.org/10.46469/mq.2025.65.4.2>

Saputra, E., Ridwan, M., Effendi, A., Defriza, R., & Hidayat, R. (2024). Darul Ahdi wa Syahadah and the Implementation of Maqasid Al-Shariah in the Context of the Pancasila State. *Nurani*, 24(2), 460–475. <https://doi.org/10.19109/nurani.v24i2.25028>