

Principal Educator Management on Strengthening the 21st Century Skills of Elementary School Teachers: A Systematic Literature Review

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Abstract

Twenty-first century skills have become an essential competency for teachers in responding to the demands of modern education, particularly in critical thinking, communication, collaboration, and creativity. This study aims to analyze the role of educator management and school principals in developing teachers' 21st century skills in elementary schools. The research employed a Systematic Literature Review (SLR) method by systematically examining scientific articles relevant to the topic. The review process included source identification, article selection based on predetermined criteria, and analysis of research findings. The results indicate that school principal management plays a strategic role in strengthening teachers' 21st century skills through professional development planning, collaborative teacher activities, academic supervision oriented toward 21st century learning, and continuous monitoring and evaluation. In addition, principals who implement participatory, communicative, and visionary leadership styles are able to foster professional interactions that support communication, collaboration, and adaptability among teachers. The study concludes that planned and collaborative educator management by school principals is a key factor in enhancing teachers' 21st century competencies and improving the quality of elementary education.

Keywords: *educator management, principal, 21st century skills, teachers, Systematic Literature Review*

Abstract

Keterampilan abad ke-21 menjadi kompetensi penting yang harus dimiliki guru dalam menghadapi tuntutan pendidikan modern, terutama dalam aspek berpikir kritis, komunikasi, kolaborasi, dan kreativitas. Penelitian ini bertujuan menganalisis peran manajemen tenaga pendidik dan kepala sekolah dalam mengembangkan keterampilan abad ke-21 guru di sekolah dasar. Penelitian menggunakan metode Systematic Literature Review (SLR) dengan mengkaji secara sistematis artikel-artikel ilmiah yang relevan dengan topik penelitian. Proses kajian dilakukan melalui identifikasi sumber, seleksi artikel berdasarkan kriteria yang telah ditentukan, serta analisis terhadap temuan penelitian. Hasil penelitian menunjukkan bahwa manajemen kepala sekolah memiliki peran strategis dalam memperkuat keterampilan abad ke-21 guru melalui perencanaan pengembangan profesional, pelaksanaan kegiatan kolaboratif antarguru, supervisi akademik yang berorientasi pada pembelajaran abad ke-21, serta pengawasan dan evaluasi berkelanjutan. Kepala sekolah yang menerapkan gaya kepemimpinan partisipatif, komunikatif, dan visioner mampu membangun interaksi profesional yang mendukung kemampuan komunikasi, kolaborasi, dan adaptasi guru terhadap perubahan. Penelitian ini menyimpulkan bahwa manajemen tenaga pendidik yang terencana dan kolaboratif menjadi faktor kunci dalam meningkatkan keterampilan abad ke-21 guru serta mutu pendidikan di sekolah dasar.

Keywords: *educator management, principal, 21st century skills of teachers, systematic review literature*



INTRODUCTION

The implementation of education in Indonesia is inseparable from the role of various elements that collaborate in the implementation of education. Starting from elementary education to the next level. Good management is needed by the principal so that the money school he leads has good quality. Good management is especially in the management of educators or teachers by school principals. Management is a process and form of business to be able to develop the existing potentials of the resources owned to be able to achieve the goals to be achieved (Realty, 2024). Any organization will succeed if it uses management that is in accordance with its function (Suharisimi & Yuliana, 2012).

Although much research on 21st century skills has been conducted, both in the context of learning and teacher competency development, studies that specifically synthesize how the management function of educators by principals in elementary schools in the context of strengthening 21st century skills is still limited. Most studies tend to discuss 21st century skills as individual competencies of teachers or the outcome of the learning process, without examining in depth how the managerial role of school principals as key actors in managing and developing these competencies is systematic. This gap shows the need for studies that integrate the perspective of education management with the development of 21st century skills of teachers.

21st century skills are a guide to transformational education (Thornhill-Miller et al., 2023). Findings in the field by researchers regarding the management of educators by school principals in an effort to strengthen the skills of 21st century teachers in elementary schools encountered several obstacles. The biggest obstacle faced by school principals in implementing their programs related to strengthening 21st century teachers' skills is the too rapid development of technology and motivation which is an internal factor from teachers to improve their skills. Many senior teachers find it difficult to adapt and already feel the need to strengthen their 21st century skills. The 21st century skills needed by teachers emphasized by the Ministry of Education and Culture include 4Cs (Critical Thinking, Creativity, Communication, Collaboration) (Diani & Mustika, 2024; Mardhiyah et al., 2021). Not only that, good digital literacy is also needed by teachers related to mastery of technology, media, and digital information as a support to create 21st century learning by teachers.

School principals are facing an era of disruption where critical and innovative thinking is an aspect needed to face challenges in the development of the times (Yulianto et al., 2024). The principal holds the highest authority as the enforcer of the components in the school he leads (Ndoen & Manurung, 2021). In 21st century learning, it requires more emphasis on teachers to have 21st century skills to match the demands of the increasingly developing times. This also aims to enable students to implement 21st century skills obtained from teacher learning. Therefore, mastery of 21st century skills by teachers is important in the modern era like now. In addition, collaborative learning can make students more able to think critically (Mizani, 2024).

In this context, the management function which includes planning, organizing, actuating, and controlling is an important framework in understanding how school principals can manage teachers as strategic human resources. These four functions not only play a role in administrative management, but also have direct implications for strengthening teachers' 21st century skills. Planning is concerned with the preparation of professional development programs based on 21st century skills needs; organizing focuses on the formation of learning communities and teacher collaboration; implementation related to academic supervision and implementation of innovative learning; and control plays a role in continuous evaluation and reflection on the development of teacher competencies. Thus, the integration of management functions with strengthening 21st century skills is an important conceptual foundation in this study.

The problem in this study is how school principals can manage teachers as human resources in the school to be able to strengthen the 21st century skills needed by teachers in learning. In addition, this research also aims to find out how school principals can overcome and create programs to strengthen 21st century skills that teachers must have in schools. This study also analyzes various factors related to the management of school principals to be able to succeed in teacher competency strengthening programs. Especially in the aspect of 21st century skills which is one of the focuses in the research in this research.

METHODS

The method used in this study is to use a descriptive qualitative research approach and a systematic literature review (SLR) method. This approach was chosen to examine in depth and research that focuses more on conceptual understanding and patterns in the findings in the literature review found. The subject in this study is a scientific article that is relevant to the focus of the study. SLR is used as a way to obtain a comprehensive synthesis with a focus in this study on the role of school principals in managing educators to strengthen teachers' 21st century skills.

The data in the study were collected based on the methods used and according to the context (Scott, 2016). The data used in this research is sourced from national and international scientific articles that are considered relevant to the focus of this study, namely the management of educators, principals, and 21st century skills of teachers in elementary schools. The data sources were obtained from several scientific databases, namely Google Scholar, Scopus, and ERIC, with a publication year range of 2020–2025 to ensure relevance to the development of 21st century education issues. The article search process is carried out using keywords such as: "*Principal Leadership*", "*Educator Management*", "*Teacher Professional Development*", "*21st Century Skills*", "*Elementary School*", and "*Instructional Leadership*".

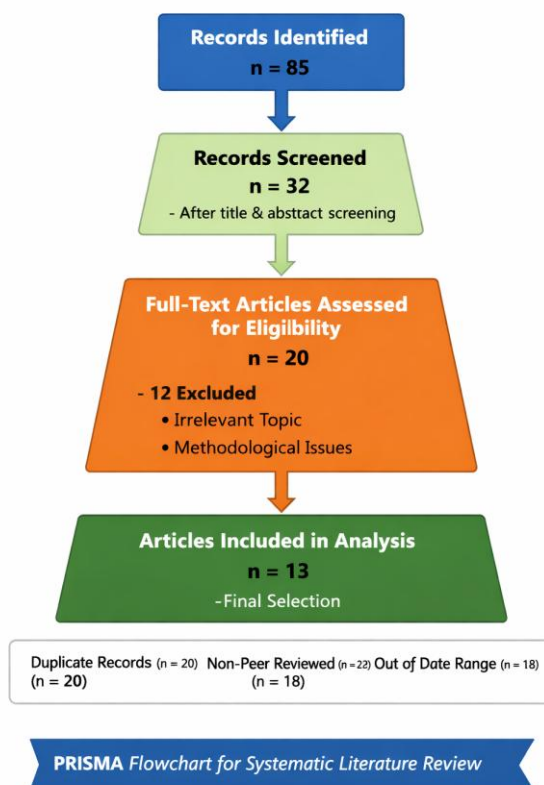
The selection of articles was carried out using inclusion criteria. Inclusion criteria include: (1) articles discussing educator management or principal leadership, (2) relating to the development of teachers' 21st century competencies or skills, (3) being peer-reviewed articles, and (4) being available in full text. In addition, a quality assessment of the article was carried out using indicators such as the clarity of the research objective, the suitability of the method, the validity of the findings, and the relevance to the focus of the study. The article selection stage follows the principle of PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), which includes identification, screening, eligibility, and inclusion. The initial search results obtained ±85 articles, then selected based on inclusion criteria until 13 final articles were obtained that were analyzed in depth.

Data is collected by systematically documenting and analyzing important information and findings in the source article. Each article is analyzed to identify important information, including the research objectives, the context and subject of the research, the approaches and methods used, the forms of educator management applied by the principal, as well as research findings related to strengthening the 21st century skills of primary school teachers.

Data analysis was carried out using content analysis with a qualitative approach. The analysis process begins with data reduction, namely selecting and focusing information relevant to the management of school principal educators and strengthening teachers' 21st century skills. Next, the data is categorized into main themes. The next stage is data synthesis, which is comparing and integrating findings between articles to identify patterns, similarities, and differences in reported practices. Based on the results of the synthesis, the researcher drew conclusions that comprehensively describe the role and management strategies of school principal educators in strengthening the 21st century skills of elementary school teachers. These components are interconnected

things before, during, and after data collection is carried out in building a general insight (Miles et al., 2014)

The results of the analysis are presented in an analytical descriptive manner to provide a complete and contextual understanding of how educator management by school principals contributes to the improvement of teachers' 21st century skills, as well as its implications for education management in primary schools.



RESULTS AND DISCUSSION

Table 1. SLR Article Review Table

Num	Author	Article Title	Findings
1.	Badriyah (2022)	<i>Supervisi Akademik Kepala Sekolah dalam Meningkatkan Kinerja Guru</i>	Planned and continuous academic supervision has been proven to improve teacher performance and professionalism. Strengthen teachers' critical thinking, communication, and collaboration through reflection, professional discussions, and collective learning.
2.	Sholeh, et al.(2021)	<i>Human Resource Management in Improving the Quality of Teachers at Islamic Basic Education Institutions</i>	Effective human resource management plays a significant role in improving the quality and competence of teachers. Supporting adaptability, initiative, professional competence, and continuous improvement as 21st century competencies.

3.	Şahin (2025)	<i>Teachers' Professional Development: Opportunities and Challenges in Türkiye</i>	The support of the principal and institutional policies determine the success of teacher professional development. Relevant to strengthening lifelong learning, digital literacy, innovation, and self-development teachers.
4.	Pitriani (2024)	<i>Educational Leadership in Improving School Performance and Teacher Professional Development</i>	Principal leadership plays a strategic role in improving teacher performance through collaboration, ongoing support, and a professional learning community, which is aligned with strengthening 21st-century teachers' communication and collaboration skills.
5.	Mitchell et al (2024)	<i>Teacher Professional Development in Africa: A Critical Synthesis of Research Evidence</i>	Collaborative and contextual teacher professional development is more effective than a one-way approach, and supports teacher adaptation, reflection, and professional skills in the face of 21st-century educational changes.
6.	(Akmaluddin et al., 2025)	<i>Human Resource Management Strategy in Improving the Quality of Education</i>	Educator management which includes planning, organizing, coaching, and evaluating teacher performance contributes positively to improving teacher professionalism and the quality of elementary school education.
7.	(Aris et al., 2023)	<i>The Role of Management of Human Resources in Enhancing the Quality of Schools</i>	Effective educator management through teacher development, motivation, and retention is a key factor in improving the quality of schools and teachers' readiness to face the demands of 21st century competencies.
8.	(Fahlevi & Masrul Witarsa, 2024)	<i>Pengaruh Pola Komunikasi Kepala Sekolah terhadap Pengembangan Literasi Digital dan Kreativitas Guru di Sekolah Dasar</i>	The communication pattern of school principals has a significant effect on increasing digital literacy and teacher creativity. Digital literacy and creativity are key competencies of 21st century skills for elementary school teachers.
9.	(Guntar, 2023)	<i>The Integration of 21st Century Learning and Innovation Skills in EFL Classrooms</i>	Communication, collaboration, creativity, and critical thinking skills can be developed through targeted learning management. So that the strengthening of the 4Cs can be facilitated by the management of the principal.
10.	(Dariyono & Rusman, 2023)	<i>Curriculum Transformation in the 21st Century Education: Perspectives,</i>	The transformation of the 21st century curriculum requires the support of school leadership and the strengthening of teacher competence.

		<i>Challenges, and Prospects</i>	School principals play a strategic role in creating a 21st century skills development ecosystem.
11.	(Ndoen & Manurung, 2021)	<i>Pengaruh Kepemimpinan Kepala Sekolah terhadap Kinerja Guru SD Negeri</i>	The leadership of the principal has a positive effect on teacher performance. Teacher performance is a prerequisite for developing professional communication and collaboration skills.
12.	(Mardhiyah et al., 2021)	<i>Pentingnya Keterampilan Belajar di Abad 21 sebagai Tuntutan dalam Pengembangan Sumber Daya Manusia</i>	Teachers need to master the 4Cs, which demand the role of principal management in directing and nurturing teachers.
13.	(Iskandar et al., 2025)	<i>Hakikat Belajar Abad ke-21 dalam Mengintegrasikan Keterampilan, Pengetahuan, dan Teknologi Siswa Sekolah Dasar</i>	Showing the need for the management of school principal educators in improving the competence of elementary school teachers to be able to implement 21st century learning.

Based on the results of the analysis table that has been presented above, it can be seen that educator management by school principals plays a strategic role in strengthening teacher competence, especially in 21st century skills for elementary school teachers. Strengthening 21st century skills includes critical thinking, creativity, communication, collaboration, and digital literacy. In strengthening some of these things, it is inseparable from the role of the principal in planning, implementing, and evaluating his policies. So that various findings that have been obtained from various sources show that school principals also play a role in the professional development of teachers, not only as functional and administrator fillers.

The results of the analysis of 13 articles show that educator management by school principals plays a significant role in strengthening teachers' 21st century skills. In summary, five of the thirteen articles emphasized that academic supervision is the main strategy in improving teacher competence (Badriyah, 2022; Pitriani, 2024; Şahin, 2025; Mitchell et al., 2024; Ndoen & Manurung, 2021). Meanwhile, four other articles highlight the importance of comprehensive human resource management through planning, training, and evaluation (Sholeh et al., 2021; Akmaluddin et al., 2025; Aris et al., 2023; Dariyono & Rusman, 2023). In addition, several studies also confirm that communication patterns and principals' leadership are key factors in supporting teachers' innovation and digital literacy (Fahlevi & Witarsa, 2024; Guntar, 2023; Mardhiyah et al., 2021; Iskandar et al., 2025).

The main aspect that can be seen is the academic supervision of the principal in terms of educator management by the school principal. Directional, planned, and continuous academic supervision can improve the performance and professionalism of teachers (Badriyah, 2022). Supervision is a coaching process that can encourage communication, collaboration, and critical thinking from teachers. Ideally, supervision is to build a culture that seems professional as a foundation for strengthening the skills of 21st century teachers (Sergiovanni, 1992).

Human resource management by school principals carried out comprehensively can be a factor to determine how to strengthen teacher competence. Educator management, which has included planning teacher needs to training and evaluation, can be a thing that contributes to improving the quality and professionalism of teachers

(Akmaluddin et al., 2025; Sholeh et al., 2021). This comprehensive HR management approach can enable teachers to further develop their potential. So that teachers are an aspect that must be managed and developed systematically and not only administratively.

The success of the principal in strengthening the skills of the 21st century teacher so that the teacher is more professional is determined by how the support from the principal and the policies he makes institutionally and contextually (Mitchell et al., 2024; Şahin, 2025). Teacher professional development programs that are top-down, unsustainable, and do not pay attention to the needs of teachers will be less effective in building and strengthening teachers' 21st century skills. So that collaborative, reflective, and contextual development will be able to stimulate teachers to be able to develop digital literacy and innovation in learning. This is in line with research by Mardhiyah (2025) and Iskandar (2024) where elementary school teachers still have difficulty integrating technology in learning. So that school principals are required to actively play a role in directing, fostering, and accompanying teachers through educator management.

Some other aspects found are that there is a pattern of communication and professional interaction between the principal and the teacher. Communication patterns have a significant effect on the development of digital literacy and creativity owned by teachers (Fahlevi & Masrul Witarsa, 2024). From a 21st century skills perspective, professional communication between teachers and principals seems to be a prerequisite element for creating collaboration and innovation in schools. Meanwhile, teacher management in many schools still has a focus on administration which includes workload and completeness of documents, while strengthening competencies in the 21st century is still not maximized and is not an important focus by school principals (Dimarucot et al., 2023; Thornhill-Miller et al., 2023). This causes low teacher readiness to face the demands of 21st century learning. Therefore, it is very necessary for school principals to design policies that target strengthening skills in terms of communication, collaboration, creativity, and critical thinking for teachers which can be done through supervision, continuous training, and strengthening the teacher learning community.

The findings of this research can be analyzed through the perspectives of instructional leadership and change leadership. Within the framework of instructional leadership, the principal plays a direct role in improving the quality of learning through academic supervision, teacher professional development, and learning performance monitoring. This is reflected in the findings of Badriyah (2022) and Pitriani (2024) which show that academic supervision contributes to improving teachers' competence and professional interaction. Meanwhile, in the perspective of change leadership, the principal plays the role of an agent of transformation that encourages adaptation to the demands of the 21st century. Findings from Mitchell et al. (2024), Şahin (2025), and Dariyono and Rusman (2023) show that changes towards 21st-century learning require visionary, collaborative, and adaptive leadership to technological developments and teacher needs.

The practical implications of this study suggest that school principals need to design educator management that is not only administratively oriented, but focuses on the development of teacher competencies in a sustainable manner. Principals need to integrate academic supervision programs, needs-based training, and strengthening professional learning communities as key strategies in improving teachers' 21st century skills. In addition, open communication patterns and supportive leadership are important factors in creating an innovative and collaborative school culture.

This study has limitations because it uses a Systematic Literature Review approach that depends on the quality and availability of the articles analyzed. In addition, the relatively limited number of articles (13 articles) as well as variations in the research context can affect the generalization of the findings. This study has also not empirically

examined the implementation of educator management in the field, so further research based on case studies or field research is needed to strengthen the results of this study.

CONCLUSION

Based on the results of the SLR analysis above, it can be concluded that educator management by the head of the school has an important role in strengthening 21st century skills that must be possessed by teachers in elementary schools. The function of the head of the school is not only in the administrative field, but also the learning leader who manages teachers as human resources in their schools. The management is through strategic policies that include planning and implementation. Evaluation, coaching, and professional development of teachers on an ongoing basis. A comprehensive and effective teacher management by school principals will enable teachers to develop the 4C skills and digital literacy needed in 21st century learning.

Strengthening the skills of 21st century teachers can be done through various things. Academic supervision in the form of coaching and reflection by the principal, professional development based on teacher needs, and efforts to create a collaborative culture in schools can be carried out in order to improve teacher competence. The success of these programs is certainly influenced by the role of visionary and supportive school principals, good communication, and institutional support for the development of innovation and teacher professionalism. This gives an idea of the need for a paradigm shift in the management paradigm of school principal educators from an administrative approach to the development of 21st century skills-oriented teacher professional competencies. These findings provide implications for elementary school leadership practices in designing policies and programs to strengthen teacher competencies in a planned and sustainable manner.

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