

TRANSFORMATION OF HIGH SCHOOL DIGITAL CULTURE IN THE ERA OF SOCIETY 5.0: A SYSTEMATIC LITERATURE REVIEW (SLR)

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ABSTRACT

This study aims to map the determinants of digital culture transformation in Senior High Schools (SMA) through a Systematic Literature Review (SLR). The method applies PRISMA and PSALSAR frameworks to 17 articles (2020–2026) from Google Scholar, ScienceDirect, and Garuda. The findings identify three main factors: transformational leadership, teachers' digital competence, and students' autonomy support. Leadership acts as a catalyst for technology integration, teacher competence improves performance through motivation and discipline, while digital media enhances student digital literacy. The study concludes that digital culture transformation is driven more by human factors than technological infrastructure.

ABSTRACT

Penelitian ini bertujuan memetakan determinan transformasi budaya digital di Sekolah Menengah Atas (SMA) melalui Systematic Literature Review (SLR). Metode menggunakan PRISMA dan PSALSAR terhadap 17 artikel (2020–2026) dari Google Scholar, ScienceDirect, dan Garuda. Hasil menunjukkan tiga faktor utama, yaitu kepemimpinan transformasional, kompetensi digital guru, dan dukungan otonomi siswa. Kepemimpinan berperan sebagai katalis integrasi teknologi, kompetensi guru meningkatkan kinerja melalui motivasi dan disiplin, sedangkan media digital mendukung literasi siswa. Temuan menegaskan bahwa transformasi budaya digital lebih ditentukan oleh faktor manusia dibandingkan infrastruktur teknologi.

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1. Introduction

Entering the era of Society 5.0, the world of education is experiencing a paradigm shift from simply using technology as a tool to establishing an integrated digital learning ecosystem. The transformation of digital culture in schools is not only related to the digitization of devices, but also encompasses changes in mindset, organizational behavior, and pedagogical practices oriented towards the sustainable use of technology.(Setyawan, 2022)In the context of Senior High Schools (SMA), this transformation demands synergy between school leadership, teacher competence, and support for the student learning environment.

Theoretically, this research integrates Transformational Leadership Theory which emphasizes the role of leaders in driving innovation and organizational change.(Schmitz et al., 2023), as well as Self-Determination Theory (SDT) which emphasizes the importance of autonomy support in increasing students' motivation and digital literacy(Chiu et al., 2022; Dhawan, 2020)Both approaches are relevant to explaining how digital culture can be sustainably formed in secondary education environments.

The urgency of digital cultural transformation has increased following the COVID-19 pandemic, which has accelerated the adoption of online learning in various educational institutions.(Dhawan, 2020)However, the effectiveness of technology implementation in schools is determined not only by infrastructure readiness, but also by human resource readiness and organizational resilience. Without a thorough cultural transformation, technology use has the potential to create a digital divide and reduce the quality of pedagogical interactions.(Lestari, 2025).

Various previous studies have shown that studies on digital transformation in education are still dominated by technical aspects, such as measuring teachers' digital competence.(Jaka Warsihna et al., 2026; Siti Laily Masnah et al., 2024)and the effectiveness of utilizing digital learning platforms(Herry Sumual et al., 2026)Although digital leadership has been identified as having an impact on school performance(Jem Cloyd M. Tanucan et al., 2022; Syupriadin et al., 2026), studies that integrate psychological aspects such as achievement motivation and work discipline in the context of digital culture are still limited(Pratiwi & Purbojo, 2025).

In addition, there is a research gap in connecting education policies at the macro level with teacher competency development practices at the micro level, particularly through innovative approaches such as microlearning.(Betancur-Chicué & García-Valcárcel Muñoz-Repiso, 2023a). To date, there have been few studies that

systematically integrate transformational leadership, teacher digital competence, and student autonomy support within a single analytical framework for digital culture in high schools.

Based on these gaps, this study aims to map the main determinants of digital culture transformation in high schools through a Systematic Literature Review (SLR) approach. Specifically, this study analyzes: (1) the role of transformational leadership in technology integration, (2) the influence of digital competence on teacher performance mediated by motivation and work discipline, and (3) the role of the digital learning ecosystem in supporting student literacy and autonomy. This study is expected to provide theoretical contributions in the development of digital education management as well as practical contributions for schools in building a sustainable digital culture.

2. Method

This research is a literature study using the Systematic Literature Review (SLR) method. This method was chosen to identify, review, and synthesize previous research on digital cultural transformation in a transparent and accountable manner.(Lame, 2019)The research procedure is carried out based on the PSALSAR (Protocol, Search, Appraisal, Synthesis, Analysis, and Report) framework.(Wondimagegn Mengista et al., 2020), which combines the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines(Page et al., 2021). The description of the procedures applied and the results in this study are as follows:

2.1 Developing a protocol: Determining the scope of the study.

The researchers reviewed previous research on digital culture in secondary schools. They then formulated research questions. The questions to be answered are as follows:

- What factors influence the success of digital culture transformation in high schools?
- What is the role of teacher leadership and competence in mediating the performance of digital organizations?
- What media and environmental supports are effective in fostering students' digital literacy?

2.2 Assessment: selection and assessment of the quality of literature.

At this stage, the researcher determines the criteria. The following is the determination of the inclusion and exclusion of the literature to be analyzed..

Literature quality assessment was conducted by examining methodological suitability, clarity

of data sources, and publication reputation (Sinta-accredited or Scopus-indexed/internationally indexed articles), without using standardized quality assessment instruments (e.g., JBI Critical Appraisal Tools or CASP checklist); articles whose methodology was not adequately explained were excluded at the eligibility stage. The identification, screening, and eligibility selection processes in this study were conducted by the principal investigator, thus not involving independent screening by more than one reviewer; this is acknowledged as a methodological limitation of this study and is discussed further in the Conclusion section.

Following are the keywords used in each database.

Table 1List of Literature Studies

Database	Keywords
Garuda	Digital culture, transformational leadership, teacher digital competence, teacher performance, educational management
Google Scholar	Digital culture in schools, transformational leadership, teachers' digital competence, teachers' experiences, high school.
Science Direct	Digital transformation in education, transformational leadership in schools, teachers' digital competence.

Table 2. Inclusion Criteria

No	Criteria	Inclusion (Accepted)	Exclusion (Rejected)
1	Time span	Articles published between 2020 - 2026.	Articles published before 2020.
2	Document Type	Original scientific journal articles (peer-reviewed) and review articles.	Books, theses, dissertations, popular opinions, or news reports.
3	Language	Indonesian and English.	Besides Indonesian and English.
4	Subject/Context	High School (SMA/SMK), Teachers, Principals, and Students.	Early childhood education or non-educational sector.
5	Focus of Study	Digital transformation, digital leadership, teacher competency, and school culture.	Only discusses physical infrastructure without human resource analysis.

2.3 Literature search: determine the search strategy and database to be used.

The data collection procedure was carried out by identifying journal articles in electronic databases such as Google Scholar, ScienceDirect, and other accredited journal portals (Sinta).

The criteria listed in Table 2 were used by researchers to screen articles by examining the title, abstract, and research methods. After finding articles that met the inclusion criteria, the selected articles were carefully read to obtain a description of the title, data collection, research results, and conclusions. Data were prioritized to contain three aspects of information in accordance with the formulation of this SLR research question.

The article selection process was carried out using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow to ensure transparency and accountability in literature selection.(Page et al., 2021).

The selection process is carried out through four main phases as follows:

2.3.1 Identification

At this stage, researchers identified all relevant articles from three main databases: Google

Scholar, ScienceDirect, and Garuda. The search process used keywords related to "digital culture," "transformational leadership," "teacher digital competence," and "student digital literacy." The initial search yielded 1,456 articles. The search was conducted between January 15–20, 2025, with the initial number of articles being 742 from Google Scholar, 387 from Garuda, and 327 from ScienceDirect.

2.3.2 Screening

In the screening stage, a filtering process was conducted based on duplication and relevance of titles and abstracts. Duplicate articles were removed, leaving 1,324 unique articles. Next, a filtering process was conducted based on the relevance of the titles and abstracts to the research focus, leaving 212 articles deemed relevant for the next stage.

2.3.3 Eligibility

In the eligibility stage, the remaining 212 articles were analyzed in more depth through full-text reading. Articles were evaluated based on established inclusion and exclusion criteria, including publication year (2020–2026), focus on digital cultural transformation in education, and relevance to leadership, teacher competency, and student digital literacy. This process eliminated

many articles for not comprehensively addressing research variables or focusing solely on infrastructure aspects.

2.3.4 Included

The final stage yielded 17 articles that met all inclusion criteria and were deemed most relevant to answering the research questions. These articles were then used as the basis for synthesis in a thematic analysis to map the determinants of digital culture transformation in high schools.

2.3.5 Synthesis

Summarizing and integrating the selected literature. At this stage, the collected and assessed information is synthesized. The goal is to combine findings from multiple studies or data sources to identify key patterns, trends, and insights.

2.3.6 Analysis

Analyze and synthesize the literature. This stage involves a more in-depth analysis of the synthesized data or findings. This analysis helps test hypotheses or answer research questions, focusing on gaining actionable insights.

2.3.7 Report

At this stage, researchers report the methodology, findings, conclusions, and recommendations based on the analysis. This serves to communicate the results of the systematic review or evidence synthesis to stakeholders, policymakers, or the scientific community.

Based on the selection process, 17 articles were obtained through three main databases, namely 387 articles from GARUDA, 742 articles from Google Scholar, and 327 articles from ScienceDirect which is a relevant scientific journal. The initial selection process of 1,456 articles

revealed a significant number that did not meet the criteria because they did not comprehensively address transformational leadership, teacher digital competence, or student autonomy support. The initial screening found duplicate articles, leaving 1,324 unique articles. 1,112 articles were then eliminated from the titles and abstracts, leaving only 212 articles worthy of full review. Finally, 17 final articles were obtained that were the most representative in explaining the transformation of digital culture in high schools. The PSALSAR framework in this study was integrated with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol to ensure transparency in the selection process. The SLR process flow is depicted in detail in Figure 1.

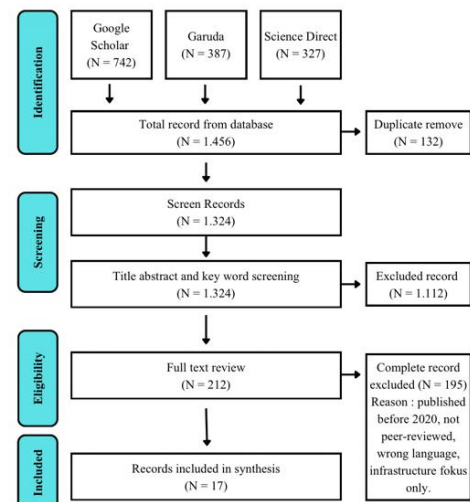


Figure 1 Systematic Literature Review Flowchart (Adapted from ((Pollock & Berge, 2018; Santos et al., 2021))

3. Results and Discussion

3.1 Results

The results of the observations were synthesized in line with the research formulation that had been established from various research literature and are presented in Table 3.

The literature presented in this article concludes that the success of digital transformation in schools is not solely determined by the availability of infrastructure, but rather depends on the quality of leadership and the competence of human resources. The synthesis of findings, summarized in Table 3, reveals three key aspects:

1. Digital Leadership & Culture

Transformation in secondary schools is

driven by transformational leadership that creates a “digital school culture” (Setyawan, 2022). Leaders must empower teachers to use technology in cognitively challenging activities. (Schmitz et al., 2023).

2. Teacher Competence & Performance

Teacher competence is not only technical, but involves safety and problem solving. (García-Delgado et al., 2023). Achievement motivation is a key mediator; high digital competence will improve performance optimally if supported by strong motivation. (Pratiwi & Purbojo, 2025).

3. Media & Learning Support

The most common media are LMS, interactive platforms, and AI-based tools. The choice of media should support student autonomy to foster sustainable digital literacy. (Chiu et al., 2022).

Table 3Data Synthesis

No.	Writer	Digital Transformation Content	Implementation Methods/Strategies	Digital Cultural Media/Tools
1	(Schmitz et al., 2023)	Use of cognitively demanding technology	Transformational leadership for teacher empowerment.	<i>Learning Management Systems(LMS)</i>
2	(Syupriadin et al., 2026)	Employee performance and efficiency	Digital leadership and strategic adaptation.	Digital workflow platform
3	(García-Delgado et al., 2023)	5 Digital Domains (DigCompEdu)	Self-assessment and directed professional training.	Digital communication tools
4	(Chiu et al., 2022)	Digital Literacy & Autonomy	Autonomy-supporting teaching with an SDT perspective.	Interactive learning support tools
5	(Pratiwi & Purbojo, 2025)	Performance & Discipline	Mediation of achievement motivation in digital workflows.	Digital assessment application
6	(Setyawan, 2022)	Digital school culture	Integration of school values with digital habits.	Social media & online forums

Table 4Findings

No.	Research Questions	Conclusion
1	What factors influence digital culture?	Transformational leadership, digital competence, and adaptive governance (Jian & Mustafa, 2024).
2	How do competencies affect performance?	Through the mediation of achievement motivation and professional discipline (Pratiwi & Purbojo, 2025).
3	What is the impact on students?	Improving digital literacy and intrinsic engagement through autonomy support (Chiu et al., 2022).

3.2 Discussion

This section discusses the research findings by integrating data extraction results and supporting theories to answer how secondary school digital culture can be formed sustainably.

3.2.1Transformational Leadership:

Key Drivers of Technology Integration Research shows that the role of the principal has shifted from being merely an administrative manager to a digital leader. Transformational leadership in the digital age is not just about procuring equipment, but about building a collective vision and teacher confidence.(Schmitz et al., 2023).Transformational leadership contributes to creating an environment that supports technology acceptance among teachers, including reducing resistance to digital change.(Mulyadi et al., 2025).

This finding is supported by the concept of Pedagogical Resilience(Jem Cloyd M. Tanucan et al., 2022), where secondary school leaders in times of crisis (such as post-pandemic) must have the resilience to continue integrating technology despite infrastructure limitations. In Indonesia, the main challenge to digital leadership often lies in the hierarchical school culture, requiring a more participatory approach to foster innovation.(Syupriadin et al., 2026).

3.2.2Digital Competence, Motivation, and Teacher Performance:

Teacher competency studies reveal that digital literacy does not stand alone in influencing performance. There is a close link between digital competency and work discipline and achievement motivation.(Pratiwi & Purbojo, 2025).Teachers with high digital competencies tend to be

more disciplined in managing online learning administration and have higher motivation to produce creative materials.

However, an analysis of the UNESCO instrument used in Warsihna et al.'s (2026) study shows that many teachers are still stuck at the "tool utilization" level and have not yet reached the "content innovation" level. This is in line with findings in Spain by García-Delgado et al. (2023), who identified that the areas of "Digital Security" and "Problem Solving" are two of the weakest points for teachers today. Therefore, professional development strategies can no longer use a one-way lecture model, but must shift to a flexible, concise, and targeted Microlearning model.(Betancur-Chicué & García-Valcárcel Muñoz-Repiso, 2023b).

3.2.3Digital Media and Student Literacy

Autonomy-Based The formation of a digital culture in secondary schools (SMA) ultimately aims to improve the quality of student learning.

Based on Self-Determination Theory (SDT), a healthy digital culture is a culture that provides autonomy support for students (Chiu et al., 2022). This means that technology should be used to give students choices in how they learn and demonstrate their competencies.

Digital school culture in high school(Setyawan, 2022)This includes integrating ethical communication practices on social media and utilizing collaboration platforms. The challenge of inclusivity is a crucial issue in the Society 5.0 era.(Lestari, 2025)Schools must ensure that their educational management strategies embrace the diversity of students, including those with limited access to technology. Digital transformation that focuses solely on elite groups will

widen the digital divide, so school governance policies must be adaptive and inclusive.(Jian & Mustafa, 2025).

4. Conclusion

This study successfully maps the dynamics of digital culture transformation in secondary schools through a systematic literature review of 17 reputable journals. This study shows that digital culture transformation in high schools is influenced by three main factors, namely transformational leadership, teachers' digital competence, and support for students' learning autonomy.

Transformational leadership plays a crucial role in building a digital vision and a school culture that adapts to technological developments. Teachers' digital competence has been shown to impact learning performance, especially when supported by motivation and professional discipline. Meanwhile, the use of digital learning media that supports autonomous learning can sustainably improve students' digital literacy.

Research findings confirm that the success of digital cultural transformation is not solely determined by technological infrastructure, but rather depends on the quality of human resources and inclusive school governance. Therefore, schools need to develop digital transformation strategies that focus on strengthening organizational culture, developing teacher competencies, and empowering students.(Schmitz et al., 2023).

Practically, these findings provide direct contributions to the world of secondary education: principals can prioritize strengthening transformational leadership in their principal development programs, educational units can adopt microlearning-based professional development models to continuously improve teachers' digital competencies, and curriculum designers can integrate the principle of supporting student autonomy into the selection of digital learning media. Thus, the results of this SLR are not merely descriptive but also have concrete implications for educational management policies and teacher competency development at the secondary school level.

This study has several limitations that need to be considered in interpreting the findings. First, the article screening and selection process was conducted by a single researcher without independent screening by a second reviewer, potentially introducing subjective bias in the assessment of article eligibility. Second, the search strategy included only three databases (Google Scholar, ScienceDirect, and Garuda) and was limited to articles in Indonesian and English, thus potentially introducing publication bias, namely the tendency for articles with positive findings to be published more often and more easily found than articles with neutral or negative findings. Third, grey literature such as policy reports or non-indexed proceedings were not included in the corpus, potentially overlooking practical perspectives from education practitioners. Future research is recommended to involve two independent reviewers with inter-rater agreement calculations (e.g., Cohen's kappa) and to expand the database and language coverage to strengthen the validity of the findings.

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Reference List

- [1] Betancur-Chicué, V., & García-Valcárcel Muñoz-Repiso, A. (2023a). Microlearning for the Development of Teachers' Digital Competence Related to Feedback and Decision Making. *Educational Sciences*, 13(7). <https://doi.org/10.3390/educsci13070722>
- [2] Chiu, TKF, Sun, JCY, & Ismailov, M. (2022). Investigating the relationship of technology learning support to digital literacy from the perspective of self-determination theory. *Educational Psychology*, 42(10), 1263–1282. <https://doi.org/10.1080/01443410.2022.2074966>
- [3] Dhawan, S. (2020). Online Learning: A Panacea in the Time of COVID-19 Crisis. *Journal of Educational Technology Systems*, 49(1), 5–22. <https://doi.org/10.1177/0047239520934018>
- [4] García-Delgado, M. Á., Rodríguez-Cano, S., Delgado-Benito, V., & Di Giusto-Valle, C. (2023). Digital Teaching Competence among Teachers of Different Educational Stages in Spain. *Educational Sciences*, 13(6). <https://doi.org/10.3390/educsci13060581>
- [5] Herry Sumual, Stelly Viane Manawan, & Marius Yoseph Lahea. (2026). Herry's use of digital technology. *Journal of Information and Communication Technology Education*, 6.
- [6] Jaka Warsihna, M. Adning, Zulfikri, Heri Kurniawan, & A. Muntako. (2026). MEASUREMENT OF DIGITAL COMPETENCY OF ELEMENTARY SCHOOL TEACHERS. 29.
- [7] Jem Cloyd M. Tanucan, Crislee V. Negrido, & Crislee V. Negrido. (2022). *International Journal of Learning, Teaching And Educational Research*. 21.
- [8] Jian, N., & Mustafa, N. (2025). LEX LOCALIS-JOURNAL OF LOCAL SELF-GOVERNMENT DIGITAL TRANSFORMATION IN EDUCATION POLICY IMPLEMENTATION: EXAMINING GOVERNANCE MECHANISMS AND SUCCESS FACTORS IN OECD COUNTRIES.
- [9] Lame, G. (2019). Systematic literature reviews: An introduction. *Proceedings of the Design Society: International Conference on Engineering Design*, 2019-August, 1633–1642. <https://doi.org/10.1017/dsi.2019.169>
- [10] Lestari, RA (2025). Inclusive Education Management Strategy in the Era of Society 5.0, Embracing Diversity in a Digital Learning Environment. *MANAGIERE: Journal of Islamic Educational Management*, 3(2), 115–130. <https://doi.org/10.35719/managiere.v3i2.2349>
- [11] Mulyadi, M., In'am, A., & Khozin, K. (2025). Transformational Leadership in the Digital Age: Adaptive

- Strategies in Higher Education Institutions. *AL-ISHLAH: Jurnal Pendidikan*, 17(4).
<https://doi.org/10.35445/alishlah.v17i4.8202>
- [12] Page, MJ, McKenzie, JE, Bossuyt, P.M., Boutron, I., Hoffmann, T.C., Mulrow, C.D., Shamseer, L., Tetzlaff, JM, Akl, E.A., Brennan, S.E., Chou, R., Glanville, J., Grimshaw, J.M., Hróbjartsson, A., Lalu, M.M., Li, T., Loder, E.W., Mayo-Wilson, E., McDonald, S., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. In *BMJ* (Vol. 372). BMJ Publishing Group.
<https://doi.org/10.1136/bmj.n71>
- [13] Pollock, A., & Berge, E. (2018). How to do a systematic review. In *International Journal of Stroke* (Vol. 13, Number 2, pp. 138–156). SAGE Publications Inc.
<https://doi.org/10.1177/1747493017743796>
- [14] Pratiwi, YD, & Purbojo, R. (2025). The Influence of Digital Competence and Work Discipline on Teacher Performance with Achievement Motivation as the Mediator at XYZ Elementary School. In *Journal of Innovation, Evaluation, and Learning Development (JIEPP)* (Vol. 5, Number 1).
<http://journal.ainarapress.org/index.php/jiepp>
- [15] Santos, V., Sousa, M.J., Costa, C., & Au-Yong-oliveira, M. (2021). Tourism towards sustainability and innovation: A systematic literature review. *Sustainability* (Switzerland), 13(20).
<https://doi.org/10.3390/su132011440>
- [16] Schmitz, M.L., Antonietti, C., Consoli, T., Cattaneo, A., Gonon, P., & Petko, D. (2023). Transformational leadership for technology integration in schools: Empowering teachers to use technology in a more demanding way. *Computers and Education*, 204.
<https://doi.org/10.1016/j.compedu.2023.104880>
- [17] Setyawan, R. (2022). Embracing the Future: Digital School Culture in Tabanan High Schools. *K@ta Kita*, 10(1), 141–148.
<https://doi.org/10.9744/katakita.10.1.141-148>
- [18] Siti Laily Masnah, Mumu Komaro, & Kamin Sumardi. (2024). Digital Competence of Vocational School Teachers Facing the Challenges of Digital Learning. 12(1).
<http://journal.umpo.ac.id/index.php/dimensi/index>
- [19] Syupriadin, S., Listyasari, WD, Mayasari, LI, & Kamaludin, K. (2026). Leadership and Employee Performance in Digital Transformation: A Systematic Review (2020–2025). *Edunesia: Scientific Journal of Education*, 7(1), 359–379.
<https://doi.org/10.51276/edu.v7i1.1592>
- [20] Wondimagegn Mengista, Teshome Soromessab, & Gudina Legese. (2020). Method for conducting systematic literature reviews and meta-analysis for environmental science research. *Elsevier B.V.*, 77(4), 393–406.