

The Influence of Digital Laboratory Facilities, Work Motivation, and Intrinsic Motivation on the Digital Literacy Of Public High School Teachers in Pelalawan Regency

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ARTICLE INFO

Keywords: Digital Literacy, Digital Laboratory Facilities, Work Motivation, Intrinsic Motivation, High School

Received : 12, July

Revised : 25, August

Accepted: 20, September

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ABSTRACT

This study aims to analyze the influence of digital laboratory facilities, work motivation, and intrinsic motivation on the digital literacy of public high school teachers in Pelalawan Regency. The research employed a quantitative survey method, involving 202 teacher respondents selected through proportional random sampling from all public high schools in the area. The research instrument consisted of a Likert-scale questionnaire that had been tested for validity and reliability. Data were analyzed using multiple linear regression to examine both the partial and simultaneous effects of the three independent variables on digital literacy. The results indicate that digital laboratory facilities and intrinsic motivation have a positive and significant effect on teachers' digital literacy, while work motivation does not have a significant partial effect. These findings underscore that enhancing teachers' digital literacy requires not only the provision of facilities but also strategies to strengthen intrinsic motivation and provide continuous training. The practical implication of this research is the necessity for integrated policies and programs in the development of teachers' digital literacy to create an innovative and adaptive educational ecosystem in response to technological advancements.

INTRODUCTION

The development of digital technology has fundamentally transformed the global education ecosystem, demanding that every educator adapt and enhance their digital literacy competencies (UNESCO, 2022; Caena & Redecker, 2019). In the era of the Fourth Industrial Revolution and Society 5.0, technology is no longer merely a tool; it is the foundation of learning transformation toward processes that are inclusive, adaptive, and collaborative (Mardiana, 2021; P. Lestari & Machmudah, 2023). Digital literacy among teachers is a strategic issue because educators' mastery of technology is the key to successful integration of digital-based learning (Jayadi et al., 2023). Thus, improving teachers' digital literacy is one of the essential requirements for meeting the challenges of 21st-century education.

The Merdeka Belajar policy launched by the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia emphasizes the importance of digital transformation in schools (Kemdikbudristek, 2023). The implementation of this policy encourages educators to actively utilize digital technology in learning, aligned with efforts to strengthen globally competitive human resources (Kominfo, 2023; Etikawati, 2021). However, the results of the 2023 National Digital Literacy Index Survey indicate disparities in digital literacy mastery between teachers in urban and non-urban areas, including in Riau Province, with the national average score remaining at a moderate level (3.70 out of 5) (Kominfo, 2023). This condition suggests that technology integration in schools is not yet fully optimal, particularly in terms of the utilization of digital facilities and teacher motivation.

The provision of digital laboratory facilities in schools is one of the main strategies to strengthen the digital literacy of teachers and students (Syah et al., 2019; Devi & Winangun, 2024). Adequate facilities, such as computer laboratories and internet networks, are the primary supporting infrastructure for developing technological skills in educational settings (Firmansyah & Dede, 2022). In Pelalawan Regency, several public schools already have digital laboratories, but the utilization of these facilities has not been accompanied by an evenly distributed increase in teachers' digital literacy (Nurfadillah, 2025; Yaniawati, 2021). This indicates the need for integrated strategies between the provision of physical infrastructure and the strengthening of user capacity.

In addition to facilities, teachers' work motivation also plays a significant role in the development of digital literacy (Hardianto et al., 2023; Cahyati & Adelia, 2024). Strong work motivation encourages teachers to participate in training, adopt instructional innovations, and integrate technology on an ongoing basis (Robbins & Judge, 2019; Nuratilah et al., 2023). Herzberg's theory emphasizes the importance of motivator and hygiene factors in influencing performance and teachers' acceptance of new technologies (Herzberg, 1968; Hasibuan, 2017). A supportive work environment, adequate incentives, and opportunities for professional development are important elements for increasing teacher motivation and performance in the context of education digitalization.

Intrinsic motivation is also a key factor in the successful adoption of digital technology by teachers (Deci & Ryan, 2000; Wismawati et al., 2025). Teachers

with high intrinsic motivation tend to be more adaptive, independent, and proactive in developing digital competencies, both through formal and informal learning (Halim, 2022; Rahayuningsih & Muhtar, 2022). Self-Determination Theory asserts that fulfilling the needs for autonomy, competence, and relatedness is the primary driver for the emergence of sustained intrinsic motivation (Karataş & Arpacı, 2021). Previous studies have shown that intrinsic motivation affects not only performance but also teachers' willingness to keep learning and innovating in digital learning.

Although many studies have discussed the importance of teachers' digital literacy and motivation, research that simultaneously examines the influence of digital laboratory facilities, work motivation, and intrinsic motivation on teachers' digital literacy remains limited, especially in public schools in non-urban areas such as Pelalawan Regency (Wiguna, 2023; Nirmala et al., 2023). Most previous research has focused on a single aspect in isolation, thus not providing a comprehensive picture of the interaction among these three variables (Solehudin, 2021; Cahyani et al., 2022). Yet the synergy between physical infrastructure and psychological factors is believed to strengthen the effectiveness of digital transformation in schools.

The context of Pelalawan Regency, which is progressing toward a digital education ecosystem, adds urgency to this study, given the scarcity of local research addressing the interaction between facilities, work motivation, and intrinsic motivation among teachers (Rahayuningsih & Muhtar, 2022; Wiguna, 2023). Public schools in this region already have adequate digital laboratories, but the increase in teachers' digital literacy is not yet evenly distributed. Therefore, data-driven research is necessary to identify the linking factors between the availability of facilities and user capacity so that targeted policies can be formulated.

Based on this background, this article aims to analyze the effects of digital laboratory facilities, work motivation, and intrinsic motivation on the digital literacy of public high school teachers in Pelalawan Regency. This research is expected to provide theoretical and practical contributions to the development of digital education, particularly in designing strategies to improve teachers' digital literacy through optimizing facilities, training, and strengthening motivation. The synthesis of the study's results is expected to serve as a reference for schools and local governments in formulating digital education policies that are needs-based and sustainable.

METHOD

Research Design and Approach

This study used a quantitative approach with an explanatory survey method. The main objective was to analyze the effects of digital laboratory facilities, work motivation, and intrinsic motivation on the digital literacy of public high school teachers in Pelalawan Regency. The research sites included all public high schools located within the administrative area of Pelalawan Regency.

Population and Sample

The population of this study comprised all public high school teachers in Pelalawan Regency, totaling 425 individuals. The sampling technique employed

proportional random sampling, with the sample size determined using the Isaac & Michael formula, resulting in 202 teachers as respondents who met the inclusion criteria, namely being permanent teachers and actively teaching for at least the past year.

Research Variables

There were four main variables in this study, namely:

Digital Laboratory Facilities (X1): measured based on the adequacy and quality of ICT facilities available at the school. Work Motivation (X2): encompassing teachers' internal and external drives in carrying out professional duties. Intrinsic Motivation (X3): referring to teachers' desire to learn, innovate, and self-develop independently. Digital Literacy (Y): defined as teachers' competence in accessing, evaluating, utilizing, and creating digital-based information.

Instruments and Data Collection Techniques

The research instrument was a closed-ended questionnaire using a 4-point Likert scale (strongly disagree – strongly agree), which had been tested for validity and reliability. The questionnaire consisted of 16 items for digital laboratory facilities, 14 items for work motivation, 12 items for intrinsic motivation, and 20 items for digital literacy. Instrument validity was tested using product-moment correlation analysis, while reliability was assessed using Cronbach's alpha. All items were declared valid and reliable, with reliability coefficients > 0.7 .

Research Procedure

Data were collected online via Google Forms, with the link distributed to all public high schools in Pelalawan Regency. The researchers first obtained permission from the local Education Office and the respective schools. Before completing the questionnaire, respondents were provided with an explanation of the study's objectives and data confidentiality. The collected data were then compiled and verified to ensure completeness and the validity of responses.

Data Analysis Techniques

Data were statistically analyzed using multiple linear regression. The prerequisite tests—normality, linearity, multicollinearity, and heteroscedasticity—were conducted and all assumptions were met. The regression analysis aimed to determine the partial and simultaneous effects of the three independent variables on teachers' digital literacy. All analyses were performed using SPSS version 25.

Research Ethics

This study obtained ethical approval from the relevant institution. Participation was voluntary; data confidentiality was guaranteed, and data were used solely for academic purposes.

RESULTS

Description of Respondents

This study involved 202 public high school teachers in Pelalawan Regency as respondents, consisting of 86 men (42.6%) and 116 women (57.4%), with the dominant age range being 35–50 years (68%). Most respondents had more than five years of teaching experience, and the majority taught science and social

studies subjects. Respondents were distributed across all districts in Pelalawan Regency.

Description of Research Variables

The data recap showed the following mean scores for each variable:

1. Digital Laboratory Facilities: minimum value 36, maximum 64, mean 51.65 (good category).
2. Work Motivation: minimum score 32, maximum 56, mean 43.90 (moderate category).
3. Intrinsic Motivation: minimum value 28, maximum 48, mean 38.40 (good category).
4. Digital Literacy: minimum value 44, maximum 80, mean 62.80 (good category).

Validity And Reliability Tests Instrument

The validity and reliability tests for all instruments indicated that the questionnaire items were valid (calculated $r > \text{table } r$) and reliable (Cronbach's alpha 0.802–0.913).

Partial Hypothesis Test Results

Multiple linear regression analysis showed that:

Digital Laboratory Facilities (X1) had a positive and significant effect on teachers' digital literacy (Y), with a t-value of 2.262 and a significance of $0.026 < 0.05$. This means that the better the digital laboratory facilities available at school, the higher the teachers' digital literacy.

Work Motivation (X2) did not have a significant partial effect on digital literacy (t-value 1.907; significance $0.059 > 0.05$), indicating that work motivation alone, without support from other factors, is not strong enough to independently increase teachers' digital literacy.

Intrinsic Motivation (X3) was the most significantly influential variable on teachers' digital literacy, with a t-value of 10.306 and a significance of $0.000 < 0.05$. This demonstrates that teachers' internal drive to learn and innovate plays a major role in strengthening digital literacy.

Simultaneous Test Results (F-test)

Simultaneously, digital laboratory facilities, work motivation, and intrinsic motivation together had a significant effect on the digital literacy of public high school teachers in Pelalawan Regency. The F-test yielded an F-value of 598.710 with a significance of $0.000 < 0.05$. This indicates that the regression model built has strong predictive power in explaining the variation of digital literacy based on the three independent variables.

Coefficient of Determination

The R Square value of 0.863 indicates that 86.3% of the variance in teachers' digital literacy can be explained by the variables of digital laboratory facilities, work motivation, and intrinsic motivation. The remaining 13.7% is influenced by other factors outside this study, such as external environment, training, or school policy.

DISCUSSION

Enhancing digital literacy among public high school teachers in Pelalawan Regency is a strategic challenge in supporting educational transformation in the era of the Fourth Industrial Revolution. This study confirms that the availability of adequate digital laboratory facilities plays an important role in accelerating teachers' mastery of digital competencies (Syah et al., 2019; Firmansyah & Dede, 2022; Nurfadillah, 2025). These findings are consistent with the studies of Devi and Winangun (2024) and Ghrbeia and Alzubi (2024), which highlight that the quality of digital infrastructure influences learning effectiveness and teachers' readiness to face technological change. Thus, investment in digital laboratory facilities should be a priority for educational institutions that aim to improve their educators' digital literacy.

However, the provision of digital laboratory facilities alone does not automatically guarantee an increase in teachers' digital literacy, because the success of digital transformation is strongly influenced by work motivation and intrinsic motivation (Hardianto et al., 2023; Herzberg, 1968; Robbins & Judge, 2019). Pattola et al. (2022) found a significant contribution of work motivation to the adaptation of ICT-based learning, while Prabowo (2023) emphasized that digital literacy is closely related to teachers' professional motivation. Therefore, a collaboration between improving facilities and strengthening work motivation is a prerequisite for the success of teacher digital literacy programs.

Intrinsic motivation plays a more dominant role in driving the enhancement of digital literacy, as evidenced by its significant effect in this study (Deci & Ryan, 2000; Wismawati et al., 2025; Halim, 2022). The study by Rahayuningsih and Muhtar (2022) also demonstrated that teachers with high intrinsic motivation are more proactive in seeking training and more adaptive to technological changes, while Abbas (2019) reinforced the positive relationship between intrinsic motivation and improved teacher performance. In conclusion, the development of training and coaching programs for teacher digital literacy should prioritize the strengthening of intrinsic motivation.

In addition, the relationship between digital literacy and instructional quality has been reinforced by previous studies, as outlined by Caena and Redecker (2019), who emphasize that digital literacy is a fundamental competence for future teachers. Damanik and Widodo (2024) showed that digital literacy capabilities are closely related to creativity and innovation in teaching, while Wigati et al. (2022) highlighted the importance of continuous digital training to close the digital literacy gap among teachers. Therefore, digital literacy not only enhances technological mastery but also improves students' learning outcomes.

The Kominfo survey (2023) and Kompas.com report (2023) show that Indonesia's national digital literacy index for teachers is still categorized as moderate, so efforts to improve digital competencies must be carried out systematically and structurally (Etikawati, 2021; Rahmawati et al., 2024; Wiguna, 2023). Studies by Latip (2020) and Fatimah & Hidayati (2023) also affirm that teachers' digital literacy can be improved through relevant training and access to adequate digital resources. Therefore, increasing the digital literacy of public

high school teachers in Pelalawan Regency needs to be supported through sustainable strategies.

The role of school principals and a conducive work environment also affects teachers' motivation and enthusiasm to develop digital literacy (Cahyati & Adelia, 2024; Mangkunegara, 2017; Sarbin, 2021). Research by Hasibuan (2019) and Siagian (2017) shows that institutional rewards and support can enhance work motivation and encourage pedagogical innovation. A collaborative environment and recognition of teachers' achievements are key to establishing a sustainable digital learning culture.

Aspects of teacher training and professional development have also been proven important in strengthening digital literacy (Voogt et al., 2015; Ertmer & Ottenbreit-Leftwich, 2010; Riel & Becker, 2008). Syarif et al. (2023) stated that needs-based and community-based training can increase teachers' confidence and skills in integrating technology. Additionally, Wiguna (2023) and Solehudin (2021) revealed the importance of intensive training programs to accelerate the adaptation of digital literacy in schools.

Teachers' digital literacy is also influenced by internal factors such as attitudes toward technology and the desire to learn (Intaniasari & Utami, 2022; Hardiyanti & Alwi, 2022; Jayadi et al., 2023). Spante et al. (2018) and Ng (2012) assert that digital competence consists of technical, cognitive, and socio-emotional dimensions that must be developed synergistically. The results of this study reinforce the importance of a multidimensional approach to building holistic digital literacy among teachers.

Indicators of digital literacy—including technical ability, information understanding, digital ethics, and digital collaboration and communication—serve as the main benchmarks for assessing the success of digital education transformation (Ferrari, 2013; Falloon, 2020; Syahfitri & Safitri, 2024). Studies by Delvita et al. (2025) and Nirmala et al. (2024) show that teachers with high digital literacy skills can create interactive and effective learning environments. Therefore, integrating digital literacy indicators into training programs is necessary to support teachers' professional development.

This study also highlights persistent obstacles to the use of digital laboratory facilities in some schools, such as limited devices, lack of technical training, and suboptimal laboratory management (Yaniawati, 2021; D. A. Putra & Raharjo, 2020; M. D. Sari, 2022). Wang et al. (2025) emphasized that user interest and satisfaction greatly influence the sustainability of digital laboratory use. Therefore, optimizing digital facilities must be accompanied by continuous technical guidance and managerial support.

On the other hand, affordance theory and Uses and Gratifications provide the perspective that digital laboratory facilities designed according to user needs will encourage active engagement among teachers and students (Çetindamar & Abedin, 2020; Yang, 2023; Spires, 2019). Research by Haddad & Draxler (2002) and Mishra & Koehler (2006) also emphasizes the importance of digital laboratories that are adaptive and integrated with the curriculum to produce positive impacts on digital literacy. Therefore, the design of facilities must consider users' pedagogical and psychological factors.

Other external factors affecting teachers' digital literacy include education policy, internet access, and support from learning communities (Redecker, 2017; Buckingham, 2015; Akhiruddin et al., 2024). Studies by Aliyah & Sapitri (2024) and Trisnawati et al. (2022) recommend synergy between institutional policies, resource availability, and active participation in digital communities to accelerate technology-based educational transformation. In conclusion, teachers' digital literacy must be supported by an integrative education ecosystem.

Overall, this study strengthens the argument that enhancing teachers' digital literacy requires a comprehensive approach that involves the provision of facilities, continuous training, the strengthening of work motivation, and the development of teachers' intrinsic motivation (Cahyani et al., 2022; Nirmala et al., 2023; Nuratilah et al., 2023). The integration of these strategies is expected to improve teachers' readiness and competitiveness in facing future educational challenges, especially in non-urban areas such as Pelalawan Regency.

CONCLUSIONS

This study confirms that strengthening the digital literacy of public high school teachers in Pelalawan Regency requires synergy between the provision of digital laboratory facilities, the strengthening of work motivation, and the enhancement of teachers' intrinsic motivation. Statistical analysis shows that digital laboratory facilities and intrinsic motivation have significant effects on teachers' digital literacy, whereas work motivation does not have a significant partial effect. However, simultaneously, these three variables make a very large contribution to improving digital literacy, with the coefficient of determination reaching 86.3%. These findings reinforce the argument that educational digital transformation cannot rely solely on the provision of physical infrastructure; it must be accompanied by motivation-building—both work-related and intrinsic—and continuous training.

The practical implication of this study is the need for teacher development strategies that prioritize strengthening intrinsic motivation and optimizing the use of digital laboratory facilities through training programs, supervision, and sustained managerial support. Educational policies at the school and regional levels should place the development of digital literacy as a priority to build an adaptive, innovative education ecosystem that aligns with 21st-century needs. Going forward, further research can explore other external factors that may affect teachers' digital literacy so that the interventions designed can be more comprehensive and genuinely needs-based in the field.

REFERENCES

- Akhiruddin, H. R., Ahmadi, A., & Raharjo, R. P. (2024). Pemanfaatan Cerita Interaktif Digital Sebagai Media Pembelajaran Bahasa yang Inovatif. *JUDIKA (JURNAL PENDIDIKAN UNSIKA)*, 12(2), 193–208. <https://doi.org/10.35706/judika.v12i2.11574>
- Aliyah, S. R., & Sapitri, E. (2024). Meningkatkan Kemampuan Literasi Digital Siswa MTS Darul Ihsan Anggana Melalui Pendekatan Problem-Based

- Learning. Jurnal Syntax Admiration, 5(10), 4164–4173. <https://doi.org/10.46799/jsa.v5i10.1693>
- Buckingham, D. (2015). Defining digital literacy – What do young people need to know about digital media? Nordic Journal of Digital Literacy, 10(Jubileumsnummer), 21-35. <https://doi.org/10.18261/ISSN1891-943X-2015-Jubileumsnummer-04>
- Caena, F. and Redecker, C. (2019). Aligning teacher competence frameworks to 21st century challenges: the case for the european digital competence framework for educators (digcompedu). European Journal of Education, 54(3), 356-369. <https://doi.org/10.1111/ejed.12345>
- Çetindamar, D. and Abedin, B. (2020). Understanding the role of employees in digital transformation: conceptualization of digital literacy of employees as a multi-dimensional organizational affordance. Journal of Enterprise Information Management, 34(6), 1649-1672. <https://doi.org/10.1108/jeim-01-2020-0010>
- Damanik, J. and Widodo, W. (2024). Unlocking teacher professional performance: exploring teaching creativity in transmitting digital literacy, grit, and instructional quality. Education Sciences, 14(4), 384. <https://doi.org/10.3390/educsci14040384>
- Devi, L. P. S. A., & Winangun, I. M. A. (2024). Peran Literasi Digital dalam Meningkatkan Kompetensi Teknologi Siswa Sekolah Dasar. Jurnal Ilmiah Pendidikan Citra Bakti, 11(4), 1255–1267. <https://doi.org/10.38048/jipcb.v11i4.4681>
- Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. Journal of Research on Technology in Education, 42(3), 255–284. <https://doi.org/10.1080/15391523.2010.10782551>
- Falloon, G. (2020). From digital literacy to digital competence: the teacher digital competency (tdc) framework. Educational Technology Research and Development, 68(5), 2449-2472. <https://doi.org/10.1007/s11423-020-09767-4>

- Fatimah, I., & Hidayati, D. (2023). Program Literasi Digital sebagai Upaya Mengembangkan Budaya Literasi di SMP. *Jurnal Basicedu*, 7(6), 3535–3547. <https://doi.org/10.31004/basicedu.v7i6.5838>
- Ferrari, A. (2013). DIGCOMP: A Framework for Developing and Understanding Digital Competence in Europe. Publications Office of the European Union. <https://doi.org/10.2788/52966>
- Firmansyah, D., & Dede. (2022). Kinerja Kewirausahaan: Literasi Ekonomi, Literasi Digital dan Peran Mediasi Inovasi. *Formosa Journal of Applied Sciences*, 1(5), 745–762. <https://doi.org/10.55927/fjas.v1i5.1288>
- Ghrbeia, S. and Alzubi, A. (2024). Building micro-foundations for digital transformation: a moderated mediation model of the interplay between digital literacy and digital transformation. *Sustainability*, 16(9), 3749. <https://doi.org/10.3390/su16093749>
- Haddad, W. D., & Draxler, A. (2002). *Technologies for Education: Potentials, Parameters, and Prospects*. Paris: UNESCO.
- Halim, A. (2022). Pengembangan kompetensi guru-pendidik di era teknologi informasi dan komunikasi abad-21.. <https://doi.org/10.31237/osf.io/9nxrw>
- Hardianto, H., Herlina, N., Rahmadena, N., Lubis, N., & Mutia, M. (2023). Upaya Praktis Meningkatkan Motivasi guru-pendidik dan Tenaga Kependidikan. *Jurnal Basicedu*, 7(3), 1951–1961. <https://doi.org/10.31004/basicedu.v7i3.5125>
- Hardiyanti, W. E., & Alwi, N. M. (2022). Analisis Kemampuan Literasi Digital guru-pendidik PAUD pada Masa Pandemi COVID-19. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, 6(4), 3759–3770. <https://doi.org/10.31004/obsesi.v6i4.1657>
- Hasibuan, M. S. P. (2017). *Manajemen Sumber Daya Manusia (Edisi Revisi)*. Jakarta: Bumi Aksara.
- Herzberg, F. (1959). *The motivation to work* (2nd ed.). New York: John Wiley & Sons.

- Hidayati, R. (2022). Correlation among school principal leadership, work culture and work motivation toward job satisfaction of junior high school teachers in balangan regency. *International Journal of Social Science and Human Research*, 05(06). <https://doi.org/10.47191/ijsshr/v5-i6-69>
- Intaniasari, Y., & Utami, R. D. (2022). Menumbuhkan Budaya Membaca Siswa Melalui Literasi Digital dalam Pembelajaran dan Program Literasi Sekolah. *Jurnal Basicedu*, 6(3), 4987–4998. <https://doi.org/10.31004/basicedu.v6i3.2996>
- Jayadi, F., Masykur, M., Adib, A., Juliwardi, I., Athaillah, T., & Muzammil, A. (2023). Sosialisasi Literasi Digital Bagi Siswa Madrasah Aliyah Negeri 2 Banda Aceh. *Media Abdimas*, 2(1), 99–105. <https://doi.org/10.37817/mediaabdimas.v2i1.2686>
- Karataş, K. and Arpacı, İ. (2021). The role of self-directed learning, metacognition, and 21st century skills predicting the readiness for online learning. *Contemporary Educational Technology*, 13(3), ep300. <https://doi.org/10.30935/cedtech/10786>
- Latip, A. (2020). Peran Literasi Teknologi Informasi dan Komunikasi pada Pembelajaran Jarak Jauh di Masa Pandemi Covid-19. *EduTeach : Jurnal Edukasi Dan Teknologi Pembelajaran*, 1(2), 108–116. <https://doi.org/10.37859/eduteach.v1i2.1956>
- Lestari, P., & Machmudah, F. (2023). Urgensi Literasi Digital Dalam Pembelajaran Pasca Pandemi COVID-19. *Jeid Journal of Educational Integration and Development*, 3(2), 71–85. <https://doi.org/10.55868/jeid.v3i2.284>
- Mangkunegara, A. A. P. (2017). *Manajemen Sumber Daya Manusia Perusahaan*. Bandung: Remaja Rosdakarya.
- Mardiana. (2021). Literasi Digital Peserta Didik Sekolah Dasar: Sebuah Studi Kepustakaan. *Journal of Instructional and Development Researches*, 1(2), 60–65. <https://doi.org/10.53621/jider.v1i2.52>
- Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017–1054.

- Ng, W. (2012). Can We Teach Digital Natives Digital Literacy? *Computers & Education*, 59(3), 1065–1078.
- Ng, W. (2012). Can we teach digital natives digital literacy? *Computers & Education*, 59(3), 1065–1078. <https://doi.org/10.1016/j.compedu.2012.04.016>
- Nirmala, A., Damayanti, U., & Nurani, R. (2024). Pendidikan soft skill dan hard skill untuk meningkatkan kompetensi diri bagi siswa menengah atas di kota pekanbaru. *PKM*, 3(2), 183-189. <https://doi.org/10.62833/pkm.v3i2.129>
- Nirmala, W., Bahalwan, F., Kasliyanto, K., Hulopi, F., & Kolengsusu, H. (2023). Improving teacher digitalization skills through training and assistance in creating virtual laboratories assisted by macromedia flash to support the independent curriculum. *Mattawang Jurnal Pengabdian Masyarakat*, 4(3), 300-306. <https://doi.org/10.35877/454ri.mattawang2091>
- Nuratilah, A., Febryanis, A., Utami, N., Roka, R., Sa'diah, S., Wulan, N., ... & Majid, N. (2023). Analisis kompetensi literasi digital dan literasi baca guna menyiapkan calon guru-pendidik cakap teknologi informasi dan komunikasi. *Enggang Jurnal Pendidikan Bahasa Sastra Seni Dan Budaya*, 4(1), 459-470. <https://doi.org/10.37304/enggang.v4i1.12090>
- Nurfadillah, S. (2025). The use of technology in the development of teacher-teaching competency pedagogy in 21st-century learning. *Journal of Information Systems Engineering & Management*, 10(32s), 1029-1034. <https://doi.org/10.52783/jisem.v10i32s.5447>
- Putra, R. A., Suriansyah, A., & Metroyadi, M. (2024). Hubungan Iklim Kerja, Motivasi Kerja dan Komitmen Kerja terhadap Kepuasan Kerja guru-pendidik SD Negeri Terakreditasi A di Kecamatan Martapura Kabupaten Banjar. *Journal Of Administration and Educational Management (ALIGNMENT)*, 7(1), 364–375. <https://doi.org/10.31539/alignment.v7i1.8757>
- Rahayuningsih, Y. and Muhtar, T. (2022). Pedagogik digital sebagai upaya untuk meningkatkan kompetensi guru-pendidik abad 21. *Jurnal Basicedu*, 6(4), 6960-6966. <https://doi.org/10.31004/basicedu.v6i4.3433>
- Rahmawati, S., Abdullah, A., & Widiaty, I. (2024). Teachers' digital literacy overview in secondary school. *International Journal of Evaluation and*

- Research in Education (Ijere), 13(1), 597.
<https://doi.org/10.11591/ijere.v13i1.25747>
- Redecker, C. (2017). European Framework for the Digital Competence of Educators: DigCompEdu. Luxembourg: Publications Office of the European Union. <https://doi.org/10.2760/159770>
- Riel, M., & Becker, H. J. (2008). Characteristics of teacher leaders for information and communication technology. In J. Voogt & G. Knezek (Eds.), *International Handbook of Information Technology in Primary and Secondary Education* (pp. 397-417). Springer. https://doi.org/10.1007/978-0-387-73315-9_24
- Robbins, S. P., & Judge, T. A. (2017). *Organizational behavior* (17th ed.). Pearson Education.
- Sarbin, D. A. (2021). Faktor-Faktor yang Memengaruhi Kinerja Pegawai: Kompensasi dan Motivasi Kerja. *Jurnal Ilmu Manajemen Terapan*, 3(2), 189–198. <https://doi.org/10.31933/jimt.v3i2.721>
- Sari, N. L., Sudarma, I., & Japa, I. G. (2021). Pola Asuh Orang Tua dan Motivasi Belajar Berhubungan Erat terhadap Hasil Belajar IPA. *MIMBAR PGSD Undiksha*, 9(3), 442. <https://doi.org/10.23887/jjpgsd.v9i2.36046>
- Siagian, S. P. (2017). *Manajemen Sumber Daya Manusia*. Jakarta: Bumi Aksara.
- Solehudin, M. (2021). Pengaruh motivasi kerja guru-pendidik dan budaya organisasi sekolah terhadap kinerja guru-pendidik sma negeri 1 petarukan kabupaten pemaalang. *JTPDM*, 1(1), 20-26. <https://doi.org/10.28926/jtpdm.v1i1.56>
- Spante, M., Hashemi, S. S., Lundin, M., & Algers, A. (2018). Digital competence and digital literacy in higher education research: Systematic review of concept use. *Cogent Education*, 5(1), 1519143. <https://doi.org/10.1080/2331186X.2018.1519143>
- Spires, H. (2019). Critical perspectives on digital literacies: creating a path forward. *Media and Communication*, 7(2), 1-3. <https://doi.org/10.17645/mac.v7i2.2209>

- Syah, R., Darmawan, D., & Purnawan, A. (2019). Analisis Faktor yang Mempengaruhi Kemampuan Literasi Digital. *Jurnal AKRAB*, 10(2), 60–69. <https://doi.org/10.51495/jurnalakrab.v10i2.290>
- Syahfitri, J. and Safitri, D. (2024). The effect of digital-based interactive modules to improve student's critical thinking skills and learning motivation on biology learning. *Jurnal Penelitian Pendidikan Ipa*, 10(5), 2495-2502. <https://doi.org/10.29303/jppipa.v10i5.3878>
- Syarif, M. I., Sari, I. P., Harahap, A. I. H., & Ozcan, Ş. E. (2023). Pengembangan E-Modul Plantnet Ayat Al-Qur'an Terpadu Sebagai Sumber Belajar Ilmu Pengetahuan SMP/MTs pada Klasifikasi Makhluk Hidup. *EDUKATIF : JURNAL ILMU PENDIDIKAN*, 5(6), 2310–2321. <https://doi.org/10.31004/edukatif.v5i6.5665>
- Trisnawati, Manalu, M., & Amini, M. (2022). Hubungan Kinerja dan Keterampilan TIK guru-pendidik terhadap Hasil Belajar dan Literasi Digital Siswa Kelas Tinggi Sekolah Dasar. *Jurnal Basicedu*, 6(6), 9440–9449. <https://doi.org/10.31004/basicedu.v6i6.4089>
- Wang, K., Feng, Y., Qin, X., & Hu, Y. (2025). Examining the double-edged effects of digital literacy on the social integration of retirement migrants. *Frontiers in Public Health*, 13. <https://doi.org/10.3389/fpubh.2025.1470319>
- Wigati, I., Faisal, F., & Astuti, R. (2022). Determining digital literacy among teacher from gender perspective through the rasch model. *Journal of Education and Learning (Edulearn)*, 16(3), 330-335. <https://doi.org/10.11591/edulearn.v16i3.20409>
- Wiguna, K. (2023). Analisis kompetensi literasi digital pada guru-pendidik sekolah menengah atas. *Jurnal Riset Manajemen Komunikasi*, 3(1), 21-32. <https://doi.org/10.29313/jrmk.v3i1.2316>
- Yang, C. (2023). Research on strategies for school-based training of digital literacy for university teachers. *Adult and Higher Education*, 5(20). <https://doi.org/10.23977/aduhe.2023.052021>