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From Chalk to Change: Redefining Teaching Quality Through Teacher Empowerment in Sabah, Malaysia

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Abstract

This study examines the roles and challenges of teachers in improving the quality of teaching and learning in secondary schools across Sabah, Malaysia. Despite numerous educational reforms, disparities in instructional quality between urban and rural schools persist, largely due to geographical constraints, limited ICT infrastructure, and post-pandemic pedagogical transitions. Using a quantitative research design, data were collected from 440 teachers through a stratified, cluster, and simple random sampling approach. Analysis based on the Malaysian Education Quality Standard Wave 2 (MEQSw2) revealed that teachers in Sabah excel as motivators (57.9%) and planners (54.1%), effectively supporting student engagement and structured lesson design. However, lower performance was found in mentoring (40.7%) and facilitating active learning (47.9%), highlighting the need for greater focus on individualized guidance and student-centred pedagogy. The findings underscore the importance of professional development, pedagogical innovation, and sustained institutional support in enhancing teacher competency. By strengthening teachers' roles as mentors and facilitators through targeted programs such as Professional Learning Communities (PLC) and SISC+ mentoring, Sabah can foster a more inclusive, creative, and equitable educational landscape aligned with 21st-century learning demands.

Keywords: Teaching quality, teacher competency, 21st-century learning, professional development, active learning

1. Introduction

In the fast-changing world of 21st-century education, teachers are very important as guides of knowledge and designers of learning experiences that help students learn the skills they need to succeed in a world that is driven by technology and is very complicated. The changing paradigm stresses the need to change how teachers teach. Teachers are now expected to not only teach content but also help students develop skills like creativity, collaboration, communication, and critical thinking, which are all known as the 4Cs. This change gives students the tools they need to deal with both academic problems and real-life situations that require them to be flexible and creative (Manuel, 2025; Khairunisa & Aqida, 2023; Larson & Clark, 2022).

To effectively cultivate these competencies, modern educators must possess a comprehensive skill set that encompasses digital literacy, cultural awareness, and pedagogical adaptability. Studies show that teachers need technology-rich training programs to learn these skills so they can create learning environments that are welcoming, interesting, and stimulating for all of their students (Manuel, 2025; Azarcon-Sanchez et al., 2024). For example, adding digital tools to lesson plans makes students more interested and helps close the gap between new technology and academic success (Олендра, 2023; Chaerani et al., 2024). Also, teachers are encouraged to be culturally responsive in their teaching, which means that the curriculum should recognise and reflect the different backgrounds of all students (Vonti et al., 2025; Weeks et al., 2020).

Also, teachers' jobs have grown to include helping students learn together. This method not only improves students' communication skills but also builds a sense of community and shared responsibility for learning outcomes (Njoroge & Nekesa, 2025; Hapsari & Prasetyarini, 2025; Weeks et al., 2020). In this situation, teachers are pushed to use new teaching methods that include project-based learning, peer collaboration, and reflective practice. These are all activities that get students to think and solve problems at a higher level (Rizaldi et al., 2020; Maulidya et al., 2025; Vonti et al., 2025). As a result, teacher education programs must prioritise the cultivation of these competencies in prospective educators, guaranteeing their readiness to excel in the dynamic classroom settings of the 21st century (Khairunisa & Aqida, 2023; Escobar, 2023).

As schools move towards being more inclusive and working together more, teachers are becoming more important in shaping a generation of students who have the skills they need to do well in a global society (Anderson & Shattuck, 2012; Nasrudin et al., 2025). By being dedicated to professional growth and lifelong learning, teachers can handle the difficulties of modern teaching, which will improve student learning outcomes and better prepare them for future challenges (Sari, 2021; Lawrence et al., 2021; Ratama et al., 2021).

2. Literature Review

The quality of pedagogy and learning in secondary schools in Sabah continues to be a significant concern that necessitates urgent attention from multiple stakeholders. Various problems have hindered the efficacy of teaching in the state, such as the shift to online assessment techniques, inadequate ICT infrastructure in rural regions, and the enduring repercussions of the COVID-19 pandemic on educational processes (Chinyere, 2021; Yusoff et al., 2022). These factors have exacerbated the disparity in educational

quality between urban and rural regions. Consequently, prioritising pedagogical innovation, investment in ICT infrastructure, and ongoing teacher training in Sabah is essential for facilitating effective and equitable education (Nsama et al., 2021; Shittu, 2022).

Within the framework of the Malaysian education system, the teacher's responsibilities are delineated in the Malaysian Education Quality Standard Wave 2 (MEQSw2), which specifies six primary functions: planner, mentor, controller, assessor, motivator, and facilitator of active learning among students (KPM, 2017). The execution of these duties in Sabah is complicated by geographical circumstances, resource constraints, and the varied backgrounds of students. Inadequate lesson planning with explicit objectives connected to the curriculum may impede learning results, particularly in rural schools (Fitriani & Budiarta, 2021). Consequently, educators in Sabah ought to have targeted exposure and training in lesson preparation tailored to local settings to enhance the significance and relevance of learning experiences for students.

Educators in Sabah serve a crucial function as mentors, assisting students in making informed choices and linking academic information to real-world circumstances. The absence of professional training, constrained time, and diminished chances for self-development have emerged as significant obstacles to successful student supervision (Sever & Ersoy, 2019; Yeni et al., 2021). These challenges are more evident in rural regions of Sabah, where access to contemporary educational resources is constrained (Nordin et al., 2021). To augment teachers' mentoring capabilities, it is imperative to expand ongoing assistance from schools and the Sabah State Education Department via pedagogical training customised to local requirements and interdisciplinary learning.

Moreover, educators in Sabah function as classroom supervisors tasked with establishing and sustaining a favourable learning atmosphere. Significant issues encompass insufficient educational infrastructure, overcrowded classrooms, and excessive teacher workloads (Octavia et al., 2022). In rural educational institutions, constrained classroom space and inadequate learning resources diminish the efficacy of teaching (Hayashi et al., 2022). Consequently, the architecture of the classroom and communication tactics must be prioritised to create a conducive learning environment. Training in classroom management and proficiency in assessment literacy are essential for instructors to evaluate student growth comprehensively (Umam & Indah, 2020).

The teacher's function as a motivator and facilitator in cultivating active learners is particularly crucial in the setting of Sabah. Research indicates that numerous educators in the state continue to depend on conventional teacher-centered methodologies and have not yet comprehensively adopted consistent student-centered practices (KPM, 2018). This methodology requires modification to cultivate more engaged, innovative, and competitive learners. Educators must get training to implement experiential learning methodologies, integrate information and communication technology, and facilitate engaging activities, including game-based learning (Wardoyo et al., 2021; Humaeroah et al., 2023). Continuous professional development programs must prioritise digital literacy, communication competencies, and educators' capacity to facilitate students' critical exploration and inquiry.

The enhancement of teaching and learning quality in Sabah is predominantly contingent upon the professionalism and ability of teachers. The analysis of the public exam- Malaysian Certificate of

Education (MCE) findings indicated that Sabah was positioned among the lowest three states in national performance from 2014 to 2016, despite improvements noted in the following years (KPM, 2018). This underscores the pressing necessity for extensive initiatives to enhance the role of educators via rigorous training, infrastructural investment, and administrative assistance in the educational sector. Improving teachers' proficiency in lesson preparation, execution, and evaluation can enhance students' academic performance in Sabah, enabling the state to attain an educational level on par with other Malaysian states (George Jette & Mohd Hamzah, 2020).

Research Objective

This study aims to measure and identify the level quality of teaching and learning in Sabah.

3. Methodology

3.1 Research Design and Context

The present study employed a quantitative research design to examine educational practices among secondary school teachers in Sabah, Malaysia. This approach was chosen to enable the systematic collection and statistical analysis of data in order to identify significant trends and relationships. The research was conducted in daily secondary schools across Sabah, encompassing approximately 200 schools under the administration of 24 District Education Offices (PPD). These schools were distributed across six administrative divisions: Southeastern, Sandakan, Northern, Western, Interior, and Southern.

3.2 Sampling Procedures

A total of 440 teachers participated in the study. To ensure representativeness, the study utilized a combination of three probability sampling techniques. First, stratified random sampling was used to classify schools according to district. Second, cluster random sampling was employed to select schools within each district. Finally, simple random sampling was applied to select approximately 40% of the teachers from each chosen school. This multi-stage sampling approach enhanced the validity and generalizability of the findings.

3.3 Research Instrument

The instrument for data collection was adapted from the Malaysian Education Quality Standard Wave 2 (MEQSw2) developed by the Ministry of Education Malaysia (2017), specifically focusing on Standard 4: Teaching and Learning. This standard emphasizes teachers' roles as facilitators who promote holistic student development and continuous learning. The items were reviewed and contextualized to align with the objectives of this study and to reflect the realities of Malaysian secondary education.

3.4 Data Collection and Analysis

Data were collected through structured questionnaires administered to the sampled teachers. The responses were coded and analyzed using the Statistical Package for the Social Sciences (SPSS) version 23. Descriptive and inferential statistical analyses were performed to explore relationships between teacher practices and quality indicators.

3.5 Application of the MEQSw2 Framework

The MEQSw2 framework served as an operational reference for evaluating teaching quality, identifying strengths and weaknesses, and planning professional development initiatives such as Professional Learning Communities (PLC) and in-service training programs (LDP). The analysis of Standard 4 provided insights into areas of pedagogical improvement, including classroom

management, ICT integration, creativity, and innovation in instruction.

Furthermore, the analyzed results supported school leaders in conducting Learning Walks and designing targeted professional growth programs. While global quality assurance frameworks offer valuable perspectives, their direct adoption in Malaysia may not account for contextual and cultural factors. Therefore, the adaptation of MEQSw2 reflects the need for a culturally responsive and context-specific quality management system to strengthen educational excellence in Malaysia.

4. Discussion of Findings

4.1 Overview of Teaching Quality Dimensions

Table 4 summarizes the quality of teaching based on six sub-constructs evaluated in this study. The analysis reveals varying levels of teacher effectiveness across motivational, instructional, managerial, and mentoring dimensions. Overall, teachers in Sabah demonstrate positive engagement and moderate proficiency across most teaching dimensions, with notable strengths in motivational and planning roles.

Table 4: Quality of Teaching by Sub-Construct (Arranged According to Highest Percentage)

Sub-Construct	% Agree & Strongly Agree	Brief Interpretation
Teacher as Motivator	57.9%	Teachers successfully provide motivation and emotional support, encouraging students to be active.
Teacher as Planner	54.1%	Teachers plan lessons effectively, though creativity in planning needs to be strengthened.
Teacher as Controller	48.4%	Teachers manage time and discipline effectively, but pedagogical control requires greater consistency.
Teacher as Assessor	48.2%	Continuous assessment is implemented, though it needs refinement and diversification.
Student as Active Learner	47.9%	Students are involved in lessons, but some remain passive in collaboration and higher-order thinking activities.
Teacher as Mentor	40.7%	The mentoring aspect among teachers is relatively weak, and students receive limited support in mastering lesson content.

4.2 Teacher as Motivator

The "Teacher as Motivator" sub-construct recorded the highest agreement (57.9%), suggesting that teachers play a vital role in inspiring and emotionally supporting students. Teachers in Sabah appear effective in building learners' confidence and promoting engagement through encouragement and empathy. This aligns with the findings of Lai and Peng (2020), who asserted that teacher motivation serves as a central determinant of student engagement

and learning persistence in 21st-century classrooms. The affective dimension of teaching thus remains a critical factor in fostering positive learning climates.

4.3 Teacher as Planner

The “Teacher as Planner” dimension (54.1%) indicates that most teachers can effectively design lesson plans, select appropriate instructional strategies, and integrate teaching aids. Nonetheless, the results point to a need for greater innovation and creativity in instructional design to better address student diversity and learning preferences. This observation supports Escribano et al. (2020), who emphasized that creative instructional planning enhances adaptive learning environments, particularly in developing educational contexts such as Malaysia.

4.4 Teacher as Controller and Assessor

Moderate levels of agreement were observed for “Teacher as Controller” (48.4%) and “Teacher as Assessor” (48.2%). While teachers exhibit adequate classroom management and assessment practices, consistency and variety in pedagogical control require improvement. These findings correspond with the Malaysian Education Quality Standard Wave 2 (MEQSw2) (Ministry of Education Malaysia, 2017), which underscores the need for authentic, continuous assessment alongside effective classroom discipline. Teachers’ ability to balance control and formative assessment remains essential in sustaining productive learning environments.

4.5 Student as Active Learner

The “Student as Active Learner” sub-construct (47.9%) suggests that nearly half of the students demonstrate active engagement in lessons. However, a substantial portion remains passive, indicating that teacher-centered pedagogical practices still predominate. This imbalance highlights the need to shift toward student-centered approaches that foster autonomy, collaboration, and higher-order thinking skills (HOTS). As Lai and Peng (2020) note, promoting active learning requires constructivist approaches that enable students to co-construct knowledge through inquiry and interaction.

4.6 Teacher as Mentor

The lowest mean score was recorded for “Teacher as Mentor” (40.7%), revealing a shortfall in teachers’ ability to guide and support students individually. The limited mentoring interaction may stem from teachers’ heavy focus on lesson planning and classroom control rather than personalized academic guidance. This is consistent with Escribano et al. (2020), who highlighted the importance of embedding mentoring roles in teacher professional development frameworks to strengthen instructional quality and student support mechanisms.

4.7 Implications for Professional Practice

Overall, the findings portray a generally positive outlook on teaching quality in Sabah, particularly in the domains of motivation and planning. Nevertheless, deficiencies in mentoring and student engagement remain areas of concern. To address these gaps, the implementation of Professional Learning Communities (PLC), SISC+ mentoring initiatives, and targeted in-service professional development programs (LDP) is recommended. These initiatives can empower teachers to enhance mentoring practices and shift toward a more holistic, learner-centered pedagogical paradigm.

5. Implications

5.1 Implications for Teaching Practice

The findings of this study underscore critical insights into the multifaceted roles of teachers in Sabah, particularly in the areas of student motivation and instructional planning. The *Teacher as Motivator* sub-construct, which recorded the highest agreement at 57.9%, highlights the pivotal role educators play in sustaining student engagement and emotional resilience. This aligns with contemporary educational research indicating that teacher motivation exerts a direct and substantial influence on student engagement and learning persistence in 21st-century classrooms (Lai & Peng, 2020). Hence, teachers’ ability to nurture confidence, self-efficacy, and perseverance is vital in fostering student-centered learning environments that respond to the dynamic educational landscape in Malaysia.

5.2 Implications for Instructional Design and Planning

The relatively high score for the *Teacher as Planner* construct (54.1%) demonstrates that teachers possess the necessary skills to design structured lessons and implement suitable instructional strategies. However, the findings also point to a need for teachers to adopt more innovative and creative pedagogical approaches. Integrating student-centered and technology-enhanced methodologies can better accommodate learner diversity and promote meaningful engagement (Escribano et al., 2020). As Malaysia advances toward Education 5.0, fostering creativity in lesson design will become a defining element of effective teaching practice.

5.3 Implications for Classroom Management and Assessment

Moderate results for *Teacher as Controller* (48.4%) and *Teacher as Assessor* (48.2%) reveal that while teachers manage classroom dynamics and conduct assessments competently, improvement is needed in refining pedagogical control and diversifying evaluation methods. This finding corroborates the Malaysian Education Quality Standard Wave 2 (MEQSw2) (Ministry of Education Malaysia, 2017), which emphasizes that effective classroom management must be complemented by authentic, continuous assessment practices. Future teacher training programs should thus focus on strengthening classroom control strategies while cultivating formative assessment literacy. Such measures can create a balanced classroom environment that promotes both structure and learner autonomy.

5.4 Implications for Student Engagement and Learning

The *Student as Active Learner* dimension (47.9%) indicates that a significant proportion of students remain passive participants in the learning process. This underscores the continued prevalence of teacher-centered instruction, which limits opportunities for inquiry, collaboration, and higher-order thinking. Drawing on constructivist learning theory, future pedagogical frameworks should emphasize interactive and project-based learning strategies that encourage students to take ownership of their learning (Lai & Peng, 2020). By doing so, teachers can shift from knowledge transmitters to facilitators of active and experiential learning.

5.5 Implications for Teacher Mentorship and Professional Development

The lowest score, *Teacher as Mentor* (40.7%), highlights a deficiency in the mentoring and guidance component of teaching. This shortfall may stem from teachers’ prioritization of planning and management tasks over individualized student support. As advocated by Escribano et al. (2020), strengthening mentorship roles through structured Professional Learning Communities (PLCs), peer-coaching systems, and SISC+ mentoring initiatives

can enhance teachers' capacity to provide personalized feedback and guidance. Embedding mentoring practices into professional development frameworks can cultivate a culture of shared learning, reflection, and pedagogical innovation among educators in Sabah.

5.6 Policy and Systemic Implications

From a policy perspective, the study's findings suggest the necessity of reinforcing professional development initiatives that align with MEQSw2 and the Malaysian Education Blueprint (2013–2025). Policymakers should prioritize resource allocation for continuous training programs that emphasize creativity in lesson design, authentic assessment, and mentoring practices. Moreover, strengthening the link between teacher appraisal systems and instructional improvement will ensure that professional growth remains directly tied to classroom outcomes.

5.7 Concluding Implications

In summary, while teachers in Sabah demonstrate commendable motivation and planning capabilities, significant attention must be given to mentoring and promoting active learning. Addressing these areas through contextually grounded professional development efforts can enhance the overall quality of teaching and contribute to a more inclusive, innovative, and student-centered education system in Malaysia.

6. Conclusion

6.1 Summary of Key Findings

This study reaffirms that teachers remain the cornerstone of educational quality within Sabah's evolving educational landscape. The findings highlight that while teachers display strong competencies in motivation and instructional planning, notable gaps persist in mentoring and promoting active student engagement. These disparities reflect an ongoing imbalance between cognitive, affective, and facilitative teaching dimensions. The results collectively indicate that teacher motivation and structured planning are relatively well established, whereas mentoring, formative assessment, and learner autonomy require further reinforcement.

6.2 Contextual Challenges

The weaknesses identified are often exacerbated by contextual constraints such as insufficient infrastructure, heavy workloads, and limited access to professional development, particularly in rural and under-resourced schools. Such challenges impede teachers' ability to diversify pedagogical strategies and sustain reflective practice. In line with the Malaysian Education Blueprint (2013–2025), overcoming these constraints demands a systemic approach that integrates school leadership, teacher empowerment, and localized support structures to enhance classroom effectiveness across all districts in Sabah.

6.3 Strategic and Policy Implications

To address these issues, a multi-pronged strategy is essential—one that prioritizes the strengthening of Professional Learning Communities (PLCs), the expansion of ICT infrastructure, and the implementation of continuous professional development (CPD) programs emphasizing reflective, student-centred, and innovative pedagogy. Furthermore, educational policymakers should adopt a contextually responsive framework for quality assurance that accounts for Sabah's cultural, geographic, and socioeconomic diversity. Replicating models from developed regions without local adaptation risks undermining contextual relevance and sustainability.

6.4 Future Directions

Enhancing teachers' pedagogical capacity, instructional leadership, and digital literacy will be key to bridging the educational divide between rural and urban schools. Future initiatives should focus on empowering teachers as change agents capable of fostering creativity, resilience, and lifelong learning among students. By cultivating these competencies, Sabah's education system can produce a generation of learners who are not only academically capable but also equipped with the adaptive skills necessary for success in the 21st century.

References

1. Anderson, T. and Shattuck, J. (2012). Design-based research. *Educational Researcher*, 41(1), 16-25. <https://doi.org/10.3102/0013189x11428813>
2. Azarcon-Sanchez, I., Chua, L., & Saranza, C. (2024). Evaluating 21st-century skills in english language teaching (elt) in surigao del norte, philippines: a needs assessment for teachers development. *International Journal of Social Science and Human Research*, 7(05). <https://doi.org/10.47191/ijsshr/v7-i05-50>
3. Chaerani, D., Harianto, J., Baehaqi, L., Frantius, D., & Mulvia, R. (2024). Digital literacy in the 21st century classroom: bridging the gap between technology integration and student engagement. *Global*, 2(9), 2104-2116. <https://doi.org/10.59613/global.v2i9.303>
4. Chan, S. W., Chong, C. M., & Ng, K. L. (2020). *Online learning challenges during the COVID-19 pandemic: Implications for teaching and learning effectiveness. Education and Information Technologies*, 26(6), 761–778.
5. Chinyere, O. (2021). *Online assessment transition and learning engagement in secondary schools. Journal of Educational Research and Practice*, 11(2), 45–56.
6. Escobar, M. (2023). Teacher's competencies in teaching home economics to the acquisition of student's 21st century skills. *International Journal of Research Publications*, 123(1). <https://doi.org/10.47119/ijrp1001231420234694>
7. Escribano, R., Treviño, E., Nussbaum, M., Torres Iribarra, D., & Carrasco, D. (2020). How much does the quality of teaching vary at under-performing schools? Evidence from classroom observations in Chile. *International Journal of Educational Development*, 72, 102125.
8. Fitriani, N., & Budiarta, L. (2021). *Teachers' challenges in lesson plan preparation during curriculum reform. International Journal of Instructional Development*, 4(1), 33–47.
9. George Jette, A., & Mohd Hamzah, M. (2020). *Teacher professionalism and student achievement: A Malaysian perspective. Malaysian Journal of Learning and Instruction*, 17(2), 89–103.
10. Hapsari, A. and Prasetyarini, A. (2025). Integrating 21st century skills: creative thinking, communication, collaboration, and critical thinking in the efl classroom. *Jurnal Basis*, 12(1), 71-82. <https://doi.org/10.33884/basisupb.v12i1.9953>
11. Hayashi, K., Mochizuki, T., & Yamauchi, Y. (2022). A case study of process comparison between a round-shaped and a crescent-shaped seating arrangements in studio-style learning spaces. *Learning Environments*

- Research, 26(2), 401-425. <https://doi.org/10.1007/s10984-022-09436-8>
12. Humaeroah, N., Putri, A., & Rahman, S. (2023). *Creating student-centered learning environments: The role of teachers as facilitators*. *Journal of Educational Innovation*, 5(1), 25–39.
 13. Kementerian Pendidikan Malaysia (KPM). (2017). *Standard Kualiti Pendidikan Malaysia Gelombang 2 (MEQSw2)*.
 14. Kementerian Pendidikan Malaysia (KPM). (2018). *Laporan Tahunan Penilaian Kendiri Teaching Berdasarkan MEQSw2: Bahagian Pengurusan Sekolah*.
 15. Khairunisa, D. and Aqida, D. (2023). Teacher competence in developing interactive learning in madrasah ibtidaiyah in the 21st century. *Sunan Kalijaga International Journal on Islamic Educational Research*, 7(2), 107-123. <https://doi.org/10.14421/skijier.2023.72.02>
 16. Lai, Y. C., & Peng, L. H. (2020). Effective teaching and activities of excellent teachers for the sustainable development of higher design education. *Sustainability (Switzerland)*, 12(1). <https://doi.org/10.3390/su12010028>
 - Language Teachers. *Arab World English Journal (AWEJ)* Volume7. Number 3. DOI: <https://dx.doi.org/10.24093/awej/vol7no3.19>
 17. Larson, L. and Clark, S. (2022). Digitally-enhanced literacy learning., 103-118. <https://doi.org/10.4018/978-1-7998-8405-7.ch007>
 18. Lawrence, S., Labissiere, T., & Stone, M. (2021). The 4cs of academic language and literacy., 297-316. <https://doi.org/10.4018/978-1-7998-7222-1.ch015>
 19. Manuel, J. (2025). Technology-based teacher training and enhancement of 21st-century competencies. *International Education Trend Issues*, 3(2), 76-85. <https://doi.org/10.56442/ietl.v3i2.1264>
 20. Maulidya, S., Insani, S., & Zulfah, Z. (2025). Deep learning untuk mendukung pemahaman mendalam dalam pembelajaran matematika. *Jurnal Pengabdian Masyarakat Dan Riset Pendidikan*, 4(1), 1274-1278. <https://doi.org/10.31004/jerkin.v4i1.1729>
 21. Nasrudin, E., Supriadi, U., Kosasih, A., Abdussalam, A., Fakhruddin, A., Anwar, S., ... & Rahman, R. (2025). Pedagogical re-orientation in the 21st century and its implications for islamic religious education learning. *Jurnal Iman Dan Spiritualitas*, 5(2), 201-212. <https://doi.org/10.15575/jis.v5i2.43817>
 22. Njoroge, M. and Nekesa, G. (2025). Effects of integrating 21st century skills in the curriculum on teachers' pedagogical competence in kenya. *International Journal of Learning and Development*, 15(3), 1. <https://doi.org/10.5296/ijld.v15i3.22943>
 23. Nordin, M., Farah, S., & Syahrul, M. (2021). *Professional readiness among novice teachers in Malaysia*. *Asia Pacific Journal of Education*, 41(3), 405–420.
 24. Nsama, B., Mwiya, B., & Chikonde, B. (2021). *ICT infrastructure and quality education delivery in secondary schools*. *Journal of Educational Technology*, 9(2), 77–88.
 25. Octavia, R., Hartono, Y., & Alfi, A. (2022). *Teacher stress and classroom management challenges in secondary schools*. *International Journal of Educational Psychology*, 12(2), 134–149.
 26. Олендра, Н. (2023). Teaching pathways: essential skills for 21st century teachers. *Вісник Науки Та Освіти*, (5(11)). [https://doi.org/10.52058/2786-6165-2023-5\(11\)-303-319](https://doi.org/10.52058/2786-6165-2023-5(11)-303-319)
 27. Ratama, I., Padmadewi, N., & Artini, L. (2021). Teaching the 21st century skills (4cs) in english literacy activities. *Journal of Education Research and Evaluation*, 5(2), 223. <https://doi.org/10.23887/jere.v5i2.30849>
 28. Rizaldi, D., Nurhayati, E., & Fatimah, Z. (2020). The correlation of digital literacy and stem integration to improve indonesian students' skills in 21st century. *International Journal of Asian Education*, 1(2), 73-80. <https://doi.org/10.46966/ijae.v1i2.36>
 29. Sari, S. (2025). Chemistry teachers' understanding of literacy and learning skills as part of 21st century skills: a quantitative descriptive analysis. *Quantum Jurnal Inovasi Pendidikan Sains*, 16(2), 230. <https://doi.org/10.20527/quantum.v16i2.23174>
 30. Sever, R., & Ersoy, A. (2019). *Teachers' decision-making skills and classroom autonomy*. *European Journal of Teacher Education*, 42(5), 678–692.
 31. Shittu, M. (2022). *Community collaboration for improved secondary education outcomes*. *Journal of Educational Policy and Development*, 14(1), 53–66.
 32. Umam, M., & Indah, R. (2020). *Assessment literacy among teachers: Barriers to classroom-based assessment*. *Indonesian Journal of Curriculum and Instruction*, 9(4), 245–260.
 33. Vonti, L., Rosyid, A., Indriyani, I., & Muchtar, A. (2025). Cultural responsiveness and digital tools in literacy instruction: insight from indonesian high school teachers. *English Review Journal of English Education*, 13(1), 145-154. <https://doi.org/10.25134/erjee.v13i1.11195>
 34. Wardoyo, C., Purnami, R., & Werdiningsih, A. (2021). *Gamified learning for student engagement: A 21st-century approach*. *Educational Technology Studies*, 8(3), 77–93.
 35. Weeks, K., Lawver, R., Sorensen, T., & Warnick, B. (2020). Do teachers have the skills: 21st century skills in the agricultural education classroom?. *Journal of Agricultural Education*, 61(4), 127-142. <https://doi.org/10.5032/jae.2020.04127>
 36. Yeni, T., Abdullah, R., & Aziz, A. (2021). *Cross-curricular integration and teacher challenges in Malaysian rural schools*. *Journal of Southeast Asian Education*, 15(2), 67–82.
 37. Yusoff, N., Piryani, R., & Hadie, S. (2022). *Post-pandemic learning recovery: Challenges and strategies in Malaysian secondary schools*. *Malaysian Journal of Education*, 47(1), 12–26.