

The Digital Competence of Islamic Religious Education Teachers in Developing Interactive Learning Media at SDN 7 Blangkejeren

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ABSTRACT

This study examines the digital competence of Islamic Religious Education teachers at SDN 7 Blangkejeren in developing interactive learning media. A qualitative descriptive method was used, with three IRE teachers as informants; data were collected through in-depth interviews, non-participant observation in classrooms and the teachers' preparation room, and study of lesson plans and samples of teacher-made media. The findings show that teachers' capability is concentrated in presentations and simple video, with more elaborate tools left unused. The more consequential finding is that this boundary is not principally a boundary of technical skill but a boundary of the instructional problems teachers has identified. Teachers stop at presentation and video because those two tools already answer the only problem they have formulated, namely making abstract religious content visible. Other problems, such as ascertaining understanding while a lesson is in progress or allowing students to manipulate material themselves, have not been formulated as problems, and so tools capable of addressing them are not sought. It follows that training which adds applications to a teacher's repertoire will not raise digital competence appreciably unless it also enlarges the repertoire of instructional problems. Limitations of infrastructure and training remain real but are not the principal constraint. The study concludes that developing the digital competence of IRE teachers should begin with the capacity to diagnose students' learning difficulties rather than with a list of applications.

Keywords: Teacher Digital Competence, Interactive Learning Media, Islamic Religious Education, Instructional Diagnosis, Elementary School

ABSTRACK

Penelitian ini menganalisis kompetensi digital guru Pendidikan Agama Islam di SDN 7 Blangkejeren dalam mengembangkan media pembelajaran interaktif. Penelitian menggunakan metode deskriptif kualitatif dengan tiga guru PAI sebagai informan; data dikumpulkan melalui wawancara mendalam, observasi non-partisipan di kelas dan ruang persiapan guru, serta telaah rencana pembelajaran dan contoh media buatan guru. Hasil penelitian menunjukkan bahwa kemampuan guru terpusat pada presentasi dan video sederhana, sedangkan alat yang lebih rumit tidak digunakan. Temuan yang lebih penting adalah bahwa batas kemampuan tersebut bukan sekadar batas keterampilan teknis, melainkan batas persoalan pembelajaran yang dikenali guru. Guru berhenti pada presentasi dan video karena kedua alat itu sudah menjawab satu-satunya persoalan yang mereka rumuskan, yaitu membuat materi keagamaan yang abstrak menjadi tampak. Persoalan lain seperti mengukur pemahaman saat pelajaran berlangsung atau memberi kesempatan siswa mencoba sendiri belum dirumuskan sebagai persoalan, sehingga alat yang mampu menjawabnya tidak dicari. Konsekuensinya, pelatihan yang hanya menambah penguasaan aplikasi tidak akan menaikkan kompetensi digital secara berarti tanpa disertai penambahan perbendaharaan persoalan pembelajaran. Keterbatasan sarana dan pelatihan tetap nyata, namun bukan penyebab utama. Penelitian menyimpulkan bahwa pengembangan kompetensi digital guru PAI perlu dimulai dari kemampuan mendiagnosis kesulitan belajar siswa, bukan dari daftar aplikasi.

Kata Kunci: Kompetensi Digital Guru, Media Pembelajaran Interaktif, Pendidikan Agama Islam, Diagnosis Pembelajaran, Sekolah Dasar

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I. INTRODUCTION

The integration of digital technology into Indonesian classrooms has moved rapidly from aspiration to expectation. National curriculum documents assume it, teacher certification frameworks reference it, and school accreditation instruments record it. For Islamic Religious Education the expectation carries additional weight, because the subject is frequently described as struggling with student engagement and because digital media are widely proposed as the remedy. Munawati (2024) argues that empowering sophisticated digital resources can renew Islamic Religious Education at the elementary level; Susanto and colleagues (2024) report on the development of interactive media for the same subject and setting; Rusdi and colleagues (2023) find that technology use in Indonesian Islamic schools affects students' moral development positively. The direction of the literature is consistent.

What the literature is less consistent about is how teachers' capability to produce such media should be understood. The dominant conceptualization treats digital competence as a level: teachers possess more or less of it, and studies report where a given population sits on the scale. Mulyanti, Wati, Tusminurdin, and Soma (2024), examining determinants of teacher digital competence in Indonesian vocational schools, and Tanta, Satar, Nurbaya, and Listiani (2025), assessing readiness through the TPACK-ICT framework in Papua, both work within this frame, as does the substantial international literature summarised by Schmid, Brianza, Mok, and Petko (2024) in their review of reviews on technological pedagogical content knowledge. Frameworks such as DigCompEdu and DigComp 2.2 (Vuorikari, Kluzer, & Punie, 2022) formalize the levels and supply the descriptors.

Studies conducted in this frame reach a strikingly uniform conclusion in the Indonesian context, and one that this study also reproduces at the descriptive level: teachers can use presentation software and simple video, and stop there. Ruswandi, Firdaus, and Ruswandi (2023), examining the post-pandemic readiness of Islamic Religious Education teachers for digital learning, report the same ceiling. So does Hulkun and Santosa's (2023) account of technology integration in elementary Islamic schools. The explanation offered is likewise uniform: teachers lack training, infrastructure is inadequate, and time is short. Recommendations follow directly from the explanation, and consist of more training, better infrastructure, and protected time.

There is a difficulty with this explanatory sequence that the literature has not addressed. Training in presentation software and video editing has been widely delivered in Indonesia over the past decade, infrastructure has improved substantially in many districts, and the ceiling has not moved correspondingly. If insufficient training were the binding constraint, the delivery of training should relax it. Hilhamsyah, Hidayati, and Imama (2024), studying teacher habits and workload under educational digitalization, note that additional technical training frequently fails to alter classroom practice, and Su (2023), examining teachers' digital literacy and professional identity, observes that competence measured on a scale predicts classroom use poorly. Something in the standard account is missing.

This article proposes that what is missing is the demand side. Teachers do not acquire tools in the abstract; they acquire tools that solve problems they have identified. A teacher who has formulated the problem "my students cannot picture what the pilgrimage looks like" will find that video answers it, and will have no reason to go further, because the problem is solved. A teacher who has formulated the problem "I cannot tell during the lesson which students have understood" will need something quite different, and will pursue it. On this reading, competence is bounded by the repertoire of instructional problems a teacher can articulate, and the ceiling reported so consistently in the literature is the ceiling of a problem repertoire rather than of a skill set.

This proposition may be called problem-bounded competence, and it has an immediate consequence for professional development. If competence is bounded by problems rather than by skills, then training that adds applications will produce teachers who know more applications and use the same two, which is

what the Indonesian literature repeatedly observes. Training that would move the ceiling must first enlarge what teachers notice about their students' difficulties, since a tool without a corresponding problem has no place to attach. Boyraz and Rüzgar (2024) point in this direction when they find that digital competency relates to satisfaction with digital learning through the perceived usefulness of what is learned, and Cabezas-González, Casillas-Martín, and García-Peñalvo (2021) show that personal variables shape digital competence in ways that technical instruction does not reach.

The setting of the present study offers a useful test of the proposition, because it holds constant much of what the standard account treats as causal. SDN 7 Blangkejeren is a state elementary school in Gayo Lues, a district in which infrastructure is modest and structured professional development in educational technology is intermittent. The standard account predicts that teachers here will exhibit the familiar ceiling, and they do. The value of the case lies in what the teachers themselves say when asked why they do not go further, and in whether their answers refer to what they cannot do or to what they do not need.

Islamic Religious Education raises this question in a distinctive form. Much of what the subject teaches is neither observable nor procedural in an obvious sense: the attributes of God, the meaning of sincerity, the reasons behind a ruling. The subject also contains a great deal that is procedural and observable, such as the sequence of ablution or the postures of prayer. Faqihuddin, Muflih, and Syarifudin (2024) note in their study of digital-based media for the subject that these two kinds of content place different demands on media, and Ihwanah and colleagues (2024) argue that differentiated approaches in the digital era must attend to the nature of the content being taught. Whether teachers distinguish these demands when selecting media is a direct test of the diagnostic capacity this study takes to be central.

Three questions are therefore asked. First, what digital tools do the Islamic Religious Education teachers at SDN 7 Blangkejeren actually use, and what do the media they produce look like? Second, when teachers account for the boundary of their practice, do they describe capabilities they lack or problems they do not have? Third, what does the relation between their instructional problems and their tool use imply for how their professional development should be organized? The study is confined to teachers' competence and practice; the effect of the media on student learning outcomes lies beyond its scope.

II. METHODOLOGY

The study employed a qualitative descriptive design, chosen because the research question concerns how teachers understand and account for their own practice, which requires access to their reasoning rather than to a measurement of their skill. The site was SDN 7 Blangkejeren, a state elementary school in Gayo Lues Regency, Aceh, selected purposively as a setting where Islamic Religious Education is taught by teachers working with modest technological infrastructure.

Participants were three Islamic Religious Education teachers responsible for different year groups, selected against three criteria: certification in the subject, at least one year of teaching experience at the school, and direct involvement in the planning of lessons and the preparation of learning media. Each is referred to as Teacher A, Teacher B, or Teacher C. The number of participants was small by design, since the study sought depth in each teacher's account rather than breadth of coverage. Informed consent was obtained, and the identity of participants is protected throughout.

Three data collection techniques were used. Semi-structured interviews, audio-recorded with permission and transcribed verbatim, explored teachers' understanding of digital competence and interactive media, their experience of developing and using such media, the media they had produced, and the difficulties they encountered. The interview guide was extended during data collection to include questions about specific lessons that teachers had found difficult to teach, since the initial rounds indicated that teachers' accounts of their instructional problems were more informative than their accounts of their skills.

Non-participant observation was conducted during Islamic Religious Education lessons and in the teachers' preparation room, recording the tools and media in use, teachers' fluency in operating them, student responses, and the condition of the school's technological infrastructure. Observation in the preparation room proved particularly valuable, since the process by which a teacher decided what to prepare for a forthcoming lesson was directly visible there. Document study covered lesson plans, samples of media produced by the teachers, including presentation files and links to video, and school records relating to technology.

Analysis followed the interactive model of Miles, Huberman, and Saldaña, comprising data condensation, data display, and conclusion drawing with verification. Coding proceeded in two passes. The first coded for tools, skills, and stated obstacles, reproducing the categories used in the existing literature. The second, prompted by the recurrence in interviews of statements about what teachers considered necessary rather than what they considered possible, coded for the instructional problems teachers articulated and for the correspondence between those problems and the tools they used. The concept of problem-bounded competence emerged from this second pass.

Trustworthiness was addressed through triangulation of interview, observation, and document data, particularly by comparing teachers' accounts of their media with the media themselves; through member checking, in which each teacher reviewed the description of their own practice; and through peer discussion of the emerging analysis with colleagues not involved in data collection. Ethical practice followed the principles of informed consent, confidentiality, anonymity, and beneficence, and no comparative judgement of individual teachers was reported to the school.

III. RESULTS AND DISCUSSIONS

The descriptive findings correspond closely to those reported throughout the Indonesian literature. All three teachers use presentation software competently, incorporating images, occasional audio, and simple animation. All three use video, sourced from online repositories and occasionally edited by trimming. None uses quiz applications, interactive whiteboards, simulation software, or web-based platforms, and none has attempted to produce media in which students manipulate anything. Teacher C had once attended a workshop on a quiz application and did not subsequently use it. On any of the standard frameworks, this profile would be classified as foundational.

The media themselves confirm the classification and specify it usefully. Presentation files prepared for lessons on the pillars of Islam, on the biography of the Prophet, and on the manners of daily life follow a consistent pattern: an image or short video establishes a scene, and text supplies the point. Interactivity, in the sense of a student action to which the medium responds, is absent throughout. What the media do very consistently is make something visible. A lesson on the pilgrimage shows the pilgrimage; a lesson on prayer postures shows the postures; a lesson on honesty shows a short-dramatized scene.

The interviews, however, do not support the interpretation that the teachers have reached the limit of what they could learn. Asked why they did not use more elaborate tools, none of the three answered in terms of difficulty. Teacher A said that she had what she needed. Teacher B said that the children understood once they could see it, and asked what else would be required. Teacher C, who had attended the quiz workshop, said that the application had been interesting but that he already knew who was struggling, so there was no reason to use it. These are not statements about inability. They are statements about sufficiency.

The pattern becomes clearer when teachers were asked to describe lessons, they had found difficult. All three described the same kind of difficulty and described it in the same terms: content that students could not picture. Teacher B's example was the pilgrimage, which the children of Blangkejeren have not seen. Teacher A's was the events of the Prophet's life, remote in time and place. Teacher C's was the

difference between two forms of ablution, which he described as impossible to convey in words alone. Every difficulty named across the three interviews was a difficulty of visualization, and presentation and video answer difficulties of visualization completely.

This is the sense in which competence here is bounded by problems rather than by skills. The teachers possess a single, well-formulated instructional problem, and they possess tools that solve it. They do not possess certain other problems that the subject also presents, and consequently have no use for the tools that would address those problems. The quiz application that Teacher C did not adopt would answer the problem of ascertaining understanding during a lesson; Teacher C does not have that problem, because he believes, and stated plainly, that he already knows who is struggling. Whether that belief is well founded is a separate question, and an important one, but it is not a question about digital skill.

The observational data bear on that separate question. In the lessons observed, all three teachers checked understanding by directing questions to the class as a whole and accepting answers from those who volunteered. In each lesson a substantial group of students neither volunteered nor was addressed individually, and their understanding was not established at any point. This is precisely the gap that a quiz tool, a response system, or even a paper exit slip would close. The teachers were not aware of the gap, and no amount of instruction in the operation of a quiz application would make them aware of it. The missing capability is diagnostic, not technical.

A second unformulated problem concerns the difference between religious content that can be shown and religious content that cannot. The teachers' media address the showable with real skill. Postures, sequences, historical scenes, and dramatized conduct are handled well, and the students' evident engagement during these segments, noted in every observation, is not an illusion. But the subject also asks students to grasp matters that have no visual referent: the meaning of sincerity in an act of worship, the reasoning behind a ruling, the difference between performing an obligation and understanding it. In the lessons observed, these were conveyed by exposition alone, and the media were switched off while they were discussed. Neither teacher nor students appeared to regard this as a gap. Faqihuddin, Muflih, and Syarifudin (2024) and Ihwanah and colleagues (2024) both draw attention to the differing demands of religious content on media; the teachers here have not made that distinction, and so have no problem to which a different kind of media might be the answer.

This reading does not dismiss the constraints that the teachers and the literature report. They are real, and they were confirmed by observation. The school's internet connection is intermittent, which is why teachers download video in advance rather than streaming it. Projectors are shared between classrooms, which restricts when media can be used. Structured training in educational technology has been infrequent. Hilhamsyah, Hidayati, and Imama (2024) document the compounding effect of workload on teachers' uptake of digital practice, and their finding applies here. But these constraints explain the frequency of media use, not its kind. A teacher restricted to one projector session a week would still choose an interactive activity for that session if she had a problem that required one.

It is worth noting what the constraints have produced positively. Because video must be downloaded in advance and cannot be selected spontaneously, teachers assemble a small stock of media and reuse it across years, refining it each time. Teacher A's presentation on the pillars of Islam has been revised repeatedly and is markedly better constructed than material assembled at short notice would be. Ruswandi and colleagues (2023) note in a different context that constraint can push teachers towards consolidation, and the same effect is visible here. The limited-infrastructure setting has produced a small, well-worked repertoire rather than a large and superficial one.

Internal motivation, which the teachers named as their principal support and which the literature routinely identifies as such, requires similar reinterpretation. All three teachers are motivated, and their motivation is genuine. But motivation directed at a problem that has been solved produces refinement rather than expansion. The teachers use their motivation to improve their presentations, which is a good use of it

and one that has produced real quality. It does not lead them towards tools they have no use for, and there is no reason it should. Su (2023) observes that teachers' digital identity shapes what they take up more than their measured competence does, and the mechanism visible here is a specific case of that finding.

The implication for professional development is direct and departs sharply from the recommendations that usually conclude studies of this kind. Training organised around applications will not change this practice, and the fate of Teacher C's quiz workshop indicates as much: he learned the tool, found it interesting, and had nowhere to put it. Training that would change the practice must begin with the students' difficulties rather than with the software, taking as its starting point a question such as how a teacher can know, before the end of a lesson, which children have not understood. A teacher who takes that question seriously will require a tool, and will then have a reason to learn one. The sequence matters: the problem must precede the tool, because a tool acquired without a problem is not retained.

This has a bearing on how the frameworks used to assess teachers' digital competence should be read. DigCompEdu, DigComp 2.2 (Vuorikari, Kluzer, & Punie, 2022), and TPACK all describe what a competent teacher can do, and Schmid and colleagues (2024) observe in their review that the frameworks have proliferated without corresponding gains in explanatory power. The present case suggests one reason. A scale that records what a teacher can do cannot distinguish a teacher who has stopped because she is unable to continue from a teacher who has stopped because she has arrived. These are different conditions requiring different responses, and they are indistinguishable on any level-based instrument. Prasetyo and colleagues (2025) and Sumarni (2023), both working with scale-based assessments in Indonesian settings, report levels without being able to address this distinction.

Two limitations qualify these claims. The study involves three teachers in one school, and although the account of their reasoning is detailed, the generality of problem-bounded competence cannot be established from this evidence alone; it is offered as an explanation that fits the case and that the wider literature's persistent anomalies make plausible. Further, the study inferred teachers' problem repertoires from what they said and from what their practice implied, and a design in which teachers were presented with concrete instructional difficulties and asked how they would address them would test the inference more directly than interviews about their existing practice can.

IV. CONCLUSION

The Islamic Religious Education teachers at SDN 7 Blangkejeren possess a competence that would be classified as foundational on any standard framework: presentation software and simple video, used with skill and refined over successive years, with more elaborate tools absent from their practice. The descriptive finding matches the Indonesian literature closely. The explanation, however, does not. These teachers have not stopped where they have because they were unable to go further. They have stopped because presentation and video answer completely the one instructional problem they have formulated, which is that children cannot picture what they are being taught.

The tools that go unused correspond to problems that go unformulated. Teachers do not use tools for checking understanding during a lesson because they believe they already know who is struggling, though observation showed a substantial group of students in every lesson whose understanding was never established. They do not use tools suited to religious content that has no visual referent because they have not distinguished such content from content that can simply be shown. In each instance the missing capability is diagnostic rather than technical, and it is not addressed by instruction in software.

Infrastructure and training limitations are real and were confirmed in observation, but they explain how often media are used rather than what kind of media teachers choose. The same constraints have had an unintended benefit, since the requirement to prepare media in advance has produced a small, repeatedly

refined repertoire rather than a large and superficial one. Internal motivation, likewise, is genuine and is being spent on improving what already works, which is a reasonable disposition of it.

Three recommendations follow. Professional development for teachers in this subject should begin from students' learning difficulties rather than from a catalogue of applications, since a tool acquired without a corresponding problem is not retained, as the fate of one teacher's quiz workshop demonstrates. Schools should build into their supervision practice some means by which teachers encounter evidence of what students have not understood, because such evidence is what generates new instructional problems. And assessments of teacher digital competence should be read with the awareness that a level-based instrument cannot distinguish a teacher who has stopped from inability from one who has stopped from sufficiency, although the two require entirely different responses.

The study is limited to three teachers in a single school and infers problem repertoires from interviews and observed practice. Research that presented teachers with concrete instructional difficulties and examined how they proposed to address them would test the central claim more directly, and would establish whether problem-bounded competence describes a general condition or the particular circumstances of this school.

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REFERENCES

- Boyras, S., & Rüzgar, M. E. (2024). What digital competency tells us about e-learning satisfaction of pre-service teachers. *European Journal of Education*, 59(4), e12766. <https://doi.org/10.1111/ejed.12766>
- Cabezas-González, M., Casillas-Martín, S., & García-Peñalvo, F. J. (2021). The digital competence of pre-service educators: The influence of personal variables. *Sustainability*, 13(4), 2318. <https://doi.org/10.3390/su13042318>
- Faqihuddin, A., Muflih, A., & Syarifudin, I. (2024). Vocational education and training in the field of learning media of digital-based Islamic religious education through the teaching practitioner program. *TARBAWY: Indonesian Journal of Islamic Education*, 11(1), 34–48. <https://doi.org/10.17509/t.v11i1.69406>
- Herwanto, A., Wati, U. A., Senen, A., Nurhayati, N., & Marwan, M. (2024). Application of TPACK for student learning motivation in science subjects in elementary school. *Mimbar Sekolah Dasar*, 11(2), 455–473. <https://doi.org/10.53400/mimbar-sd.v11i2.71840>
- Hilhamsyah, H., Hidayati, D., & Imama, M. L. (2024). Teacher habits and workload in the digitalization of education. *JKTP: Jurnal Kajian Teknologi Pendidikan*, 7(4), 195–206. <https://doi.org/10.17977/um038v7i42024p195>
- Hulkin, M., & Santosa, S. (2023). Integration of information technology in the transformation of religious education: Fostering learning quality in elementary Islamic schools. *Sunan Kalijaga International Journal on Islamic Educational Research*, 7(1), 21–38. <https://doi.org/10.14421/skijier.2023.71.02>
- Ihwanah, A., Idi, A., Karoma, K., Afifah, N., & Diana, D. (2024). Character building through differentiated learning of Islamic religious education in the digital era. *Ta'dib: Jurnal Pendidikan Islam*, 29(2). <https://doi.org/10.19109/td.v29i2.24890>
- Mulyana, R., & Maylawati, D. S. (2024). Exploratory data analysis to reveal learning loss condition in Islamic religious education. *International Journal of Evaluation and Research in Education*, 13(1), 43–56. <https://doi.org/10.11591/ijere.v13i1.26344>

- Mulyanti, R. Y., Wati, L. N., Tusminurdin, U., & Soma, A. M. (2024). Determinants of teacher digital competence: Empirical evidence of vocational schools in Indonesia. *International Journal of Data and Network Science*, 8(3), 1517–1530. <https://doi.org/10.5267/j.ijdns.2024.3.014>
- Munawati, S. (2024). Innovation in Islamic religious education for elementary school students by empowering sophisticated digital resources. *Mimbar Sekolah Dasar*, 11(2), 281–297. <https://doi.org/10.53400/mimbar-sd.v11i2.71797>
- Prasetyo, W. H., Sari, B. I., Saputri, R. N., Naidu, N. B. M., Triyanto, T., & Dewantara, J. A. (2025). Assessing digital competence in Indonesian students: Demographic and internet usage factors through the Rasch model. *Journal of e-Learning and Knowledge Society*, 21(2), 1–18. <https://doi.org/10.20368/1971-8829/1135991>
- Rais, M., Hariyani, H., & Isma, I. (2024). Implementasi literasi media dalam pembelajaran Pendidikan Agama Islam dan Budi Pekerti. *Edu Sociata: Jurnal Pendidikan Sosiologi*, 7(2), 615–623. <https://doi.org/10.33627/es.v7i2.2924>
- Rusdi, M., Riwayatiningsih, R., Taufik, H., & Djollong, A. F. (2023). The impact of technology use in teaching and understanding religious values on students' moral development in Islamic schools in Indonesia. *The Eastasouth Journal of Learning and Educations*, 1(3), 123–134. <https://doi.org/10.58812/esle.v1i03.158>
- Ruswandi, A., Firdaus, M. A., & Ruswandi, R. (2023). Readiness of Islamic religious education teachers for digital learning post pandemic Covid-19. *International Journal of Ethno-Sciences and Education Research*, 3(3), 77–84. <https://doi.org/10.46336/ijeer.v3i3.465>
- Schmid, M., Brianza, E., Mok, S. Y., & Petko, D. (2024). Running in circles: A systematic review of reviews on technological pedagogical content knowledge. *Computers & Education*, 214, 105024. <https://doi.org/10.1016/j.compedu.2024.105024>
- Su, Y. (2023). Delving into EFL teachers' digital literacy and professional identity in the pandemic era: Technological pedagogical content knowledge framework. *Heliyon*, 9(6), e16361. <https://doi.org/10.1016/j.heliyon.2023.e16361>
- Sumarni, S. (2023). Assessing digital competence among pre-service English language teachers: Strengths and weaknesses. *Journal of English Education and Teaching*, 7(3), 613–631. <https://doi.org/10.33369/jeet.7.3.613-631>
- Susanto, H., Marpuah, S., Sudarmadi, S., Erwahyudin, D. D., & Wahyuni, N. (2024). The development of interactive learning media for Islamic religious education in elementary schools in Indonesia. *Journal of Research in Mathematics, Science, and Technology Education*, 1(2), 77–83. <https://doi.org/10.70232/jrmste.v1i2.14>
- Tanta, T., Satar, S., Nurbaya, N., & Listiani, H. (2025). Teachers' readiness in integrating technology through TPACK-ICT framework: Evidence from Papua, Indonesia. *Jurnal Iqra': Kajian Ilmu Pendidikan*, 10(3), 1–18. <https://doi.org/10.25217/ji.v10i3.6676>
- Vuorikari, R., Kluzer, S., & Punie, Y. (2022). DigComp 2.2: The digital competence framework for citizens. Publications Office of the European Union. <https://doi.org/10.2760/115376>