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Bridging Conducting Pedagogy and Digital Technology: Teachers' Perceptions and Adoption Intentions toward a Webcam-Based Hand-Tracking Trainer

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Abstract: This study aims to analyze teachers' perceptions of the usefulness, ease of use, perceived learning, and adoption potential of the CONDUCT HandTrack Conducting Trainer a web application combining webcam hand-tracking, two-dimensional visualization, and real-time gesture scoring (perfect/good/miss) using the Technology Acceptance Model as an analytic lens. A descriptive quantitative approach complemented by qualitative data (embedded mixed-methods design) was applied to 21 teachers from teacher working groups (MGMP) in Subang Regency via a 56-item questionnaire (Likert 1–5). Descriptive analysis, Cronbach's alpha reliability testing, Pearson correlation analysis, and thematic analysis showed perceived learning highest (mean 4.35; 96.2% agreement), followed by adoption potential (4.34) and training quality (4.22), while usability (ease of use) was lowest yet positive (3.83; α=0.83). Pearson correlations among constructs were strong (r=0.71–0.84; $p<0.01$), supporting the ease → usefulness → intention path indicatively at pilot scale. Application and training ratings were 4.76 and 4.48; all participants intended to pursue further training. The dominant barrier hand-detection accuracy explains the lower ease-of-use score, yet high perceived usefulness sustains adoption intention, a pattern consistent with utility-driven adoption. Theoretically, the study extends TAM and real-time-feedback evidence to in-service teachers on an embodied skill; practically, it guides the development of music-pedagogy technology toward tracking reliability, staged practice modes, and stakeholder-specific support.

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Introduction

Conducting is a skill that demands simultaneous musical-motor coordination: a conductor translates metre, tempo, dynamics, and entry cues into hand gestures that are read in real time by ensemble members (Kelly, 1999). Mastery of this complex motor skill requires repeated guided practice and rapid, specific feedback (Ericsson, Krampe, & Tesch-Römer, 1993; Wulf, Shea, & Lewthwaite, 2010). Timely and informative feedback ranks among the most influential factors for learning (Hattie & Timperley, 2007; Shute, 2008). Many arts and culture teachers, however, come from general backgrounds and receive only limited conducting training; opportunities to practise with objective correction are almost non-existent in schools, so gesture mastery often relies on imitation without a measure of accuracy.

Technology offers a way forward. Real-time feedback, including augmented-reality-based feedback, accelerates motor-skill acquisition and increases motivation (He & Wei, 2025), and interactive technologies have benefited instrumental learning (Nijs & Leman,

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2014). Automatic gesture recognition in the conducting domain was pioneered through dynamic time warping classification using a depth camera (Fahn, Lee, & Wu, 2019), while virtual-reality systems have expanded the space for musical practice (Feng, 2023). Artificial intelligence has advanced rapidly in music education: studies examine pre-service teachers' acceptance of generative AI (He & Ren, 2025), enjoyment and behavioural intention (Li, 2026), the selection of AI-based learning technologies (Xu, 2026), and AI-assisted teaching materials (Umamah, Zulfikar, Hilmiah, Hartono, & Shodiq, 2025). AI adoption in Indonesian education is growing, though still fragmented (Suryani et al., 2026), and interest in digital platforms for music learning is rising (Ramadhani S, Karwati, & Latifah, 2026), continuing the post-pandemic shift toward online learning (Fitriyani, Fauzi, & Sari, 2020). Three tendencies persist in this literature: a dominant focus on university students rather than in-service teachers; an emphasis on the technical gesture-recognition system rather than the user experience; and a scarcity of studies combining webcam hand-tracking with real-time AI scoring for conducting practice.

Perceived ease of use carries particular weight in gesture-tracking applications, because the interaction itself depends on the system reading the user's body movement accurately; detection errors translate directly into frustration and disrupted practice. This dependence links the Technology Acceptance Model to the mechanics of motor-learning feedback: a gesture-tracking trainer functions as a feedback device, and the quality of that feedback its timeliness and specificity (Wulf et al., 2010) shapes both the perceived ease of use and the perceived usefulness of the tool. The Technology Acceptance Model (TAM) therefore serves as the analytic lens. TAM positions perceived usefulness (PU) and perceived ease of use (PEOU) as the primary determinants of behavioural intention (BI), with PEOU also influencing PU (Davis, 1989; Ajzen, 1991; Venkatesh & Davis, 2000). This framework has evolved into unified models and extensions (Venkatesh, Morris, Davis, & Davis, 2003; Venkatesh & Bala, 2008; Venkatesh, Thong, & Xu, 2012) and has been repeatedly tested through reviews and meta-analyses (Legris, Ingham, & Collerette, 2003; King & He, 2006; Marangunić & Granić, 2015; Granić & Marangunić, 2019; Granić, 2022). Among teachers, the model explains educational technology adoption well (Teo, 2011; Scherer, Siddiq, & Tondeur, 2019), and among music teachers, attitude and usefulness are key factors in technological behaviour (Zhang, King, & Prior, 2025; Zhang, 2025). Learners' attitudes toward a subject influence learning success and motivation (Kristayulita, Hardiani, & Astuti, 2026), and studies of determinants and mediating roles in learners' decisions are developing within the Indonesian context (Rahmaningtyas & Widiatami, 2026; Sutrisno et al., 2026). Teachers' capacity to integrate technology is also tied to the technological-pedagogical-content-knowledge framework (Mishra & Koehler, 2006) and to professional strengthening through training (Asbari et al., 2020).

This study aims to analyze teachers' perceptions of the usefulness, ease of use, perceived learning, and adoption potential of the CONDUCT HandTrack Conducting Trainer, a web application combining webcam hand-tracking, two-dimensional visualization, and real-time gesture scoring (perfect/good/miss) using the Technology Acceptance Model as an analytic lens.The knowledge contribution of this study lies in understanding how low-cost, real-time visual and scoring feedback delivered through a browser- and webcam-based system influences technology-acceptance mechanisms and perceptions of motor learning among in-service teachers in a developing-country setting, a population rarely examined in this literature.

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Research Method

This study used a descriptive quantitative approach complemented by qualitative data, following an embedded mixed-methods design in which the quantitative strand is primary and the qualitative strand explains the mechanisms behind the perception patterns (Creswell & Creswell, 2018; Creswell & Plano Clark, 2018; Sugiyono, 2022). Participants comprised 21 teachers, members of the Arts and Culture (junior/senior high school) and Indonesian Language (senior high school) MGMP of Subang Regency, determined through total sampling of all participants in the Music Ensemble Conducting Workshop and Training (22 June 2026); the inclusion of non-music teachers allowed cross-disciplinary applicability to be tested. Composition by level was senior high=10, junior high=10, madrasah aliyah=1; by field, Arts and Culture/Music=19 and Indonesian Language=2; and 14 of 21 participants had never used technology to practise conducting.

The object of study, the CONDUCT HandTrack Conducting Trainer web application, trains ensemble-leading skills through webcam hand-tracking and two-dimensional visualization, with real-time gesture scoring in the categories perfect/good/miss, a choice of 2/4, 3/4, and 4/4 metres, tempo control, and the practice song "Gundul-Guncul Pacul" (4/4, 100 BPM). The instrument was a 56-item questionnaire developed from TAM constructs and grouped into eight sections: consent, profile, training-implementation quality, application-use experience (PEOU indicator), perceived learning/usefulness (PU indicator), adoption potential and continuance (BI indicator), usage barriers, overall assessment, and open feedback. Perception items used a Likert 1–5 scale. Content validity was established through expert judgment: the item construct fit was reviewed by an expert panel against the operational definitions of the TAM constructs before use. Procedure: participants attended training equivalent to eight lesson-hours, practised the application directly, and then completed the questionnaire; practice scores and ratings were also recorded by the system as supporting data.

Data analysis combined descriptive statistics (mean, percentage of agreement 4–5, distribution) and internal-reliability testing using Cronbach's alpha per construct. Relationships among the TAM constructs (PEOU→PU→BI) were examined using Pearson correlation analysis on each participant's composite scores. Qualitative data were analysed thematically following Braun & Clarke (2006, 2021): familiarization, open coding, theme generation, and review, with coding cross-checked among research-team members to maintain interpretive consistency (researcher triangulation). Research ethics were maintained through voluntary participation, consent placed before all questions, and anonymization of identities (codes G01–G21). The activity was conducted with partner approval through the Senior High School Arts and Culture MGMP Forum of Subang Regency (Approval Letter No. 011/MGMP-SeniBudayaSMA/II/2026).

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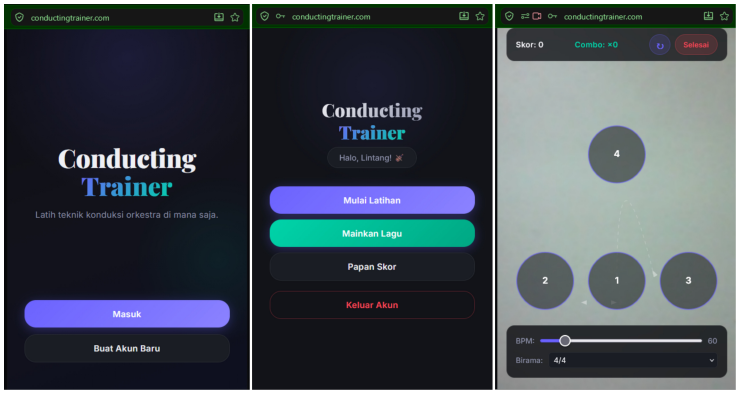

Figure 1. The CONDUCT HandTrack application: (left) login page, (center) main menu, and (right) practice interface beat-zone targets over the camera feed (2D hand-landmark visualization), real-time Score and Combo indicators, and tempo (BPM) and time-signature controls.

Results and Discussion

A) Participant Demographics and Descriptive Statistics

Participant characteristics appear in Table 1, and construct scores in Tables 2 and 3. The four constructs were mapped onto TAM: training implementation as the intervention context, use experience as the PEOU indicator, perceived learning/usefulness as the PU indicator, and adoption potential with further interest as the BI indicator.

Table 1. Participant Characteristics (N=21)

Characteristic	Category	Number
Level	Senior high / Junior high / Madrasah aliyah	10 / 10 / 1
Field	Arts and Culture–Music / Indonesian Language	19 / 2
Conducting experience	Never / 1–2 times / Sometimes / Fairly often	5 / 5 / 7 / 4
Conducting-technology experience	Never / Very rarely / A few times	14 / 4 / 3

Table 2. Scores and Reliability per Construct (N=21)

Construct (TAM mapping)	Items	Mean	Agreement (4-5)	Cronbach's α
Training-implementation quality (context)	8	4.22 (SD 0.28)	93.5%	0.68
Application-use experience PEOU	10	3.83 (SD 0.38)	70.0%	0.83
Perceived learning/usefulness PU	10	4.35 (SD 0.30)	96.2%	0.78
Adoption potential and continuance BI	7	4.34 (SD 0.33)	94.6%	0.67

Perceived usefulness (PU) was the highest construct (4.35; 96.2% agreement), while perceived ease of use (PEOU) was the lowest yet positive (3.83; 70.0%). Overall assessment reinforced this pattern (Table 3): the application and training earned high ratings, and every participant expressed interest in further training.

Table 3. Overall Assessment (N=21)

Aspect	Mean / Distribution
Application rating	4.76 (score 5: 16; score 4: 5)
Training rating	4.48 (score 5: 10; score 4: 11)
Recommendation to other teachers	Very likely: 11; Likely: 10
Interest in further training	Yes: 18; Maybe: 3

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B) Inferential Statistics: Correlation and Subgroup Differences

Pearson correlations on each participant's composite scores are presented in Table 4. All constructs were strongly positively correlated (r=0.71–0.84), and the coefficients met the significance criterion ($p<0.01$) at N=21. The strong correlations indicate strong internal coherence among the constructs; given the pilot-scale nature of the study, the coefficients are interpreted indicatively rather than confirmatively. The ease–usefulness correlation (PEOU–PU) of 0.81 and the usefulness–intention correlation (PU–BI) of 0.80 empirically support the core TAM path PEOU→PU→BI (Davis, 1989; Venkatesh & Davis, 2000), summarized in Figure 2.

Table 4. Pearson Correlations Among Constructs (N=21)

	Quality (B)	PEOU (C)	PU (D)	BI (E)
Quality (B)	1	0.84	0.80	0.78
PEOU (C)	–	1	0.81	0.71
PU (D)	–	–	1	0.80
BI (E)	–	–	–	1

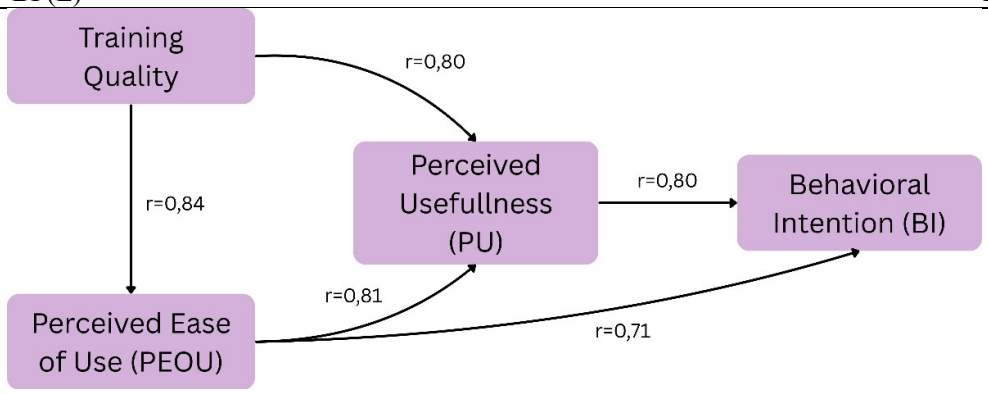

Figure 2. Conceptual model and empirical inter-construct correlations (N=21).

Subgroup analysis clarifies where the barriers lie. Teachers with more conducting experience reported higher ease of use (PEOU 4.12) and usefulness (PU 4.60) than those with little experience (PEOU 3.51; PU 4.08); teachers who had previously used practice technology reported higher ease of use (4.14 vs 3.67). Differences across levels were small (PEOU senior high 3.96 vs junior high 3.72). Ease-of-use barriers concentrate among novice users and those with less technology exposure, so a beginner mode, tutorials, and initial calibration would most effectively raise PEOU in this group and, through the PEOU→PU→BI path, strengthen adoption (Venkatesh, Morris, Davis, & Davis, 2003; Scherer, Siddiq, & Tondeur, 2019).

C) Qualitative Findings: Thematic Analysis

Six themes emerged from the open responses (numbers = mentions): applicability to student learning/ensembles (18), accuracy/consistency of hand detection (10), the need for a beginner mode/step-by-step guidance (9), tempo/practice speed (9), song variety (8), and the value of real-time feedback and scoring (6). The dominance of the learning-application theme shows that teachers viewed the application as a pedagogical medium. The response "The relationship between gesture, beat, and the perfect/good/miss response makes practice feel measurable." (G04) illustrates the perceived-usefulness mechanism, while "Provide a very basic practice mode without music first, then progress gradually to music." (G12) points to reducing cognitive load for beginners. Two Indonesian-language teachers also gained new understanding of metre patterns and the conductor's function, indicating cross-disciplinary applicability.

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Discussion

Findings extend TAM and the real-time-feedback literature from university students and screen-based skills to in-service teachers on the embodied skill of conducting. The pattern follows TAM's predictions (high PU accompanies high BI) while highlighting PEOU as a critical barrier. Perceived usefulness held the strongest position because perfect/good/miss feedback and target-beat visualization turned an otherwise abstract gesture into an observable, correctable signal consistent with findings that timely, specific feedback drives motor learning (Hattie & Timperley, 2007; Shute, 2008; He & Wei, 2025) and with the logic of deliberate practice (Ericsson et al., 1993; Wulf et al., 2010). The teachers' reading of the tool as a pedagogical medium connects the results to the TPACK framework, which links technology with pedagogical-content knowledge (Mishra & Koehler, 2006; Nijs & Leman, 2014).

Teachers maintained very high perceived usefulness (4.35) and behavioural intention (4.34) even while experiencing hand-detection difficulties that lowered perceived ease of use (3.83). This apparent tension reflects utility-driven adoption: when a tool delivers clear pedagogical value, users tolerate interaction friction and remain willing to adopt, so early acceptance is governed more by perceived usefulness than by ease of use. The strong PEOU–PU correlation (0.81) nonetheless warns that unresolved detection problems will eventually erode usefulness; improving tracking reliability therefore protects the very usefulness that currently sustains adoption.

Theoretically, the study contributes evidence that perceived pedagogical value can sustain adoption intention under suboptimal usability, refining how TAM applies to embodied, feedback-dependent skills. Practically, it directs the development of music-pedagogy technology: developers gain a clear priority order (interaction reliability first, then guided onboarding and repertoire breadth), and teacher-training providers gain a validated introductory medium for conducting instruction. Integrating CONDUCT-based practice into MGMP activities offers a low-cost pathway to strengthen a competence that school settings rarely support.

Several limitations frame the generalizability of these findings. The sample is relatively small (21) and drawn from a single regency; the cross-sectional design lacks pre–post measurement, so the findings reflect perceptions rather than objective competence gains. Application-usage data were recorded but not yet linked inferentially with perceptions. Two constructs showed internal reliability below the conventional 0.70 threshold (training quality α=0.68; behavioural intention α=0.67); values in the 0.60–0.70 range are considered acceptable for early-stage, exploratory instruments (Taber, 2018; Hair, Black, Babin, & Anderson, 2019), and the scores are interpreted cautiously as indicative, consistent with the pilot scale of the study.

Conclusion

Arts and culture teachers perceived the CONDUCT HandTrack Conducting Trainer as useful, with high perceived learning and behavioural intention, while ease of use remained the weakest point owing to hand-detection accuracy barriers. Because ease of use influences usefulness and intention within the technology-acceptance framework, the reliability of gesture tracking is the most strategic improvement priority, followed by a staged-practice mode and repertoire variety. High usefulness sustaining adoption despite usability friction points to utility-driven adoption, a pattern with clear implications for how music-pedagogy technology should be designed and introduced to in-service teachers.

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Recommendation

Concrete recommendations follow for two stakeholder groups. Application developers should prioritize hand-detection reliability and initial calibration, add a beginner mode with in-app tutorials, expand tempo and metre options together with MIDI support, and enrich the practice repertoire. Teacher communities and MGMP should integrate CONDUCT-based practice into continuing professional development activities as an introductory medium before classroom ensemble leading, pairing guided sessions with staged practice suited to novice users. Further research should adopt a pre–post or experimental design that links application-performance data with competence attainment, expand the sample across regions and levels, and test the effect of improved detection accuracy, calibration, and a beginner mode on ease of use and behavioural intention.

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References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211.

Asbari, M., Purwanto, A., Wijayanti, L., Hyun, C. C., Kusumaningsih, S. W., & Bernarto, I. (2020). Pengaruh hard skills, soft skills dan mediasi budaya sekolah terhadap kapabilitas inovasi guru di Jawa Barat. *Jurnal Kependidikan, 6*(1), 67–87. https://doi.org/10.33394/jk.v6i1.2320

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide.* SAGE.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340.

Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review, 100*(3), 363–406.

Fahn, C.-S., Lee, S.-E., & Wu, M.-L. (2019). Real-time musical conducting gesture recognition based on a dynamic time warping classifier using a single-depth camera. *Applied Sciences, 9*(3), 528. https://doi.org/10.3390/app9030528

Feng, Y. (2023). Design and research of music teaching system based on virtual reality system in the context of education informatization. *PLOS ONE, 18*(10), e0285331. https://doi.org/10.1371/journal.pone.0285331

Fitriyani, Y., Fauzi, I., & Sari, M. (2020). Motivasi belajar mahasiswa pada pembelajaran daring selama pandemik Covid-19. *Jurnal Kependidikan, 6*(2), 165–175. https://doi.org/10.33394/jk.v6i2.2654

Vol. 12, No. 3 : September 2026
E-ISSN: 2442-7667
pp. 1082-1090
Email: jklppm@undikma.ac.id

Granić, A. (2022). Educational technology adoption: A systematic review. *Education and Information Technologies, 27*(7), 9725–9744.

Granić, A., & Marangunić, N. (2019). Technology acceptance model in educational context: A systematic literature review. *British Journal of Educational Technology, 50*(5), 2572–2593. https://doi.org/10.1111/bjet.12864

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81–112.

He, S., & Ren, Y. (2025). Exploring pre-service music teachers' acceptance of generative artificial intelligence: A PLS-SEM-ANN approach. *Frontiers in Psychology, 16*, 1571279. https://doi.org/10.3389/fpsyg.2025.1571279

He, X., & Wei, L. (2025). Real-time feedback enhances motor learning and motivation in youth team sports through augmented reality tools. *Frontiers in Psychology, 16*, 1661936. https://doi.org/10.3389/fpsyg.2025.1661936

Kelly, S. N. (1999). Using conducting gestures to teach music concepts: A review of research. *Update: Applications of Research in Music Education, 18*(1), 5–10.

King, W. R., & He, J. (2006). A meta-analysis of the technology acceptance model. *Information & Management, 43*(6), 740–755.

Kristayulita, Hardiani, N., & Astuti, A. M. (2026). A comparative study of students' attitudes toward mathematics in Southeast Asia: Evidence from Indonesia and Thailand. *Jurnal Kependidikan, 12*(2), 513–524. https://doi.org/10.33394/jk.v12i2.2023 3

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & Management, 40*(3), 191–204.

Li, P. (2026). Music education with GenAI: Exploring the mediating roles of enjoyment between smart service interactional experience and behavioural intention. *European Journal of Education, 61*(1), e70423. https://doi.org/10.1111/ejed.70423

Marangunić, N., & Granić, A. (2015). Technology acceptance model: A literature review from 1986 to 2013. *Universal Access in the Information Society, 14*(1), 81–95.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108*(6), 1017–1054.

Nijs, L., & Leman, M. (2014). Interactive technologies in the instrumental music classroom: A longitudinal study with the Music Paint Machine. *Computers & Education, 73*, 40–59.

Rahmaningtyas, W., & Widiatami, A. K. (2026). Unpacking the link between work-integrated learning and graduate work readiness: The mediating role of student commitment. *Jurnal Kependidikan, 12*(2), 489–500. https://doi.org/10.33394/jk.v12i2.13022

Ramadhani S, R., Karwati, U., & Latifah, D. (2026). Vocal learning revolution: Student preferences in the digital platform era. *Jurnal Kependidikan, 12*(2). https://doi.org/10.33394/jk.v12i2.20546

Scherer, R., Siddiq, F., & Tondeur, J. (2019). The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. *Computers & Education, 128*, 13–35. https://doi.org/10.1016/j.compedu.2018.09.009

Shute, V. J. (2008). Focus on formative feedback. *Review of Educational Research, 78*(1), 153–189.

Vol. 12, No. 3 : September 2026
E-ISSN: 2442-7667
pp. 1082-1090
Email: jklppm@undikma.ac.id

Sugiyono. (2022). *Metode penelitian kuantitatif, kualitatif, dan R&D*. Bandung: Alfabeta.

Suryani, A., Susetyo, B., Tarsidi, I., Uyun, H. Q., & Elsabagh, M. (2026). Fragmented AI adoption in Indonesian special education: An adaptive multi-layer iterative model for differentiated instruction in intellectual disability contexts. *Jurnal Kependidikan, 12*(2), 538–548. https://doi.org/10.33394/jk.v12i2.20277

Sutrisno, Ausat, A. M. A., Syamsuri, Pramono, S. A., Azzaakiyyah, H. K., & Shafiq, M. A. (2026). Entrepreneurship education and perceived economic opportunities as determinants of students' entrepreneurial decisions: The mediating role of risk-taking behavior. *Jurnal Kependidikan, 12*(2), 501–512. https://doi.org/10.33394/jk.v12i2.20617

Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education, 48*(6), 1273–1296. https://doi.org/10.1007/s11165-016-9602-2

Teo, T. (2011). Factors influencing teachers' intention to use technology: Model development and test. *Computers & Education, 57*(4), 2432–2440.

Umamah, N., Zulfikar, F., Hilmiah, A. S., Hartono, F. P., & Shodiq, P. B. A. (2025). Development of digital teaching materials based on differentiated learning assisted by artificial intelligence to improve students' historical literacy. *Jurnal Kependidikan, 11*(3), 1043–1057. https://doi.org/10.33394/jk.v11i3.16735

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences, 39*(2), 273–315.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186–204.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478.

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly, 36*(1), 157–178.

Wulf, G., Shea, C., & Lewthwaite, R. (2010). Motor skill learning and performance: A review of influential factors. *Medical Education, 44*(1), 75–84.

Xu, M. (2026). Selecting AI-enabled music learning technologies in higher education using AHP and TOPSIS. *Scientific Reports.* https://doi.org/10.1038/s41598-026-43769-1

Zhang, X. (2025). What drives technology adoption in music education? A UTAUT2-based qualitative study of music teachers in Fujian, China. *International Journal of Music Education.* https://doi.org/10.1177/02557614251393862

Zhang, X., King, A., & Prior, H. (2025). Attitudes before actions: How music teachers' technological acceptance and competence shape technological behaviour in China. *Humanities and Social Sciences Communications, 12*(1), 1222. https://doi.org/10.1057/s41599-025-05582-5