

Islamic Education Teachers' Perceptions of E-Portfolios in Learning Assessment: A Technology Acceptance Model Analysis

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Abstract

Technology in the education sector continues to evolve, as evidenced by the appearance of e-portfolios. This study aims to analyse the perceptions of Islamic Education teachers at SMK Unitomo Surabaya towards the use of e-portfolios in the learning asesmen process based on the Technology Acceptance Model (TAM) theory. This study uses a qualitative approach with a field research design. Data collection techniques were conducted through interviews and observations of two informants. Data analysis utilised the model by Miles and Huberman, which includes data reduction, data presentation, and drawing conclusions. Four TAM variables were the focus of the analysis: PU; PEOU; Attitude Toward Using; and Actual System Use. The result of the study revealed that both informants held a highly positive perception of e-portfolios. Values for the PU and PEOU variables were classified as high, as shown by the ability of both teachers to operate the e-portfolio independently, its time efficiency, and the fact that there was not a single instance of resistance to the use of the e-portfolio. This study confirms that Islamic Education teachers' acceptance of the e-portfolio is influenced by their perceptions of the ease and usefulness of some technology.

Keywords: E-portfolio; Technology Acceptance Model; Islamic Education teacher

Abstrak

Teknologi dalam dunia pendidikan terus berkembang, salah satu buktinya adalah ditandai dengan munculnya e-portfolio. Penelitian ini bertujuan untuk menganalisis persepsi guru PAI di SMK Unitomo Surabaya terhadap penggunaan e-portfolio dalam proses asesmen pembelajaran berdasarkan teori Technology Acceptance Model (TAM). Penelitian ini menggunakan pendekatan kualitatif dengan jenis penelitian lapangan (field research). Teknik pengumpulan data dilakukan melalui wawancara dan observasi terhadap dua

informan, yakni dua guru PAI. Analisis data menggunakan model oleh Miles dan Huberman yang meliputi reduksi data, penyajian data, dan penarikan kesimpulan. Empat variabel TAM yang dijadikan fokus analisis adalah variabel PU; PEOU; Attitude Toward Using; dan Actual System Use. Hasil penelitian menunjukkan bahwasanya kedua informan memiliki persepsi yang sangat positif terhadap e-portfolio. Nilai dari variabel PU dan PEOU tergolong tinggi, yang ditunjukkan dari kemampuan kedua guru mengoperasikan e-portfolio secara mandiri, efisiensi waktu, serta tidak tercatat sedikitpun penolakan terhadap penggunaan e-portfolio. Penelitian ini menegaskan bahwasanya penerimaan guru PAI terhadap e-portfolio dipengaruhi oleh persepsi kemudahan dan persepsi kegunaan suatu teknologi.

Kata Kunci: *E-portfolio; Technology Acceptance Model; Guru PAI*

Introduction

Technology in education has become an important agenda that continues to be pursued and developed. UNESCO (the United Nations Educational, Scientific, and Cultural Organization) has stated that technology is rapidly transforming many aspects of social life, particularly the economy, and has begun to exert its influence on education, for instance, by helping to reduce the cost of access to education, enriching students' learning experiences, facilitating collaboration among students, and improving time efficiency (UNESCO, 2023).

One outcome of technological advancement in the field of education is the emergence of the electronic portfolio (e-portfolio) (Octarina et al., 2025), which may also be referred to as a digital portfolio or web portfolio. An e-portfolio is a collection of students' work, information, or evidence of learning compiled in digital format; this collection may include text, photographs, or videos that illustrate the developmental process of students' competencies over time (Appelbe et al., 2026). One purpose of the e-portfolio is to address the shortcomings of paper-based portfolios, commonly referred to as the conventional method, with the aim of facilitating the administration of students' assignment results (Masluhah, 2022). The e-portfolio highlights the importance of learning that positions technology as a tool for more authentic learning (Harun et al., 2021).

In addition to functioning as an assessment tool, the use of e-portfolios can also serve as a means of evaluation for students. Through e-portfolios, students are able to revisit the learning process they have undergone, identify their own strengths and weaknesses, and be assisted, together with their teachers, in planning future self-development (Agha et al., 2026). E-portfolios also play a significant role in fostering reflective and independent learning among students (Butakor, 2024). Furthermore, e-portfolios make the assessment process more transparent and collaborative, as they enable teachers to monitor and evaluate learning with greater ease (Lu, 2021). Teachers can readily access and assess students work or assignments on an ongoing basis without being constrained by limited time or location. E-portfolios also allow for the involvement of various stakeholders, such as parents and educational institutions, in monitoring students learning progress.

Against this backdrop of e-portfolio use as an assessment tool, one point deserves particular attention. The implementation of e-portfolios in Indonesia has begun to gain acceptance, indicating that an increasing number of schools and teachers are adopting e-portfolios as an assessment system, particularly among teachers from the millennial and Gen Z cohorts. These teachers regard technology as highly beneficial to their daily lives, especially in carrying out their teaching duties at schools or other institutions. Meanwhile, Generation Alpha, who currently constitute a large proportion of the student population, are highly familiar with technology, which further supports the implementation of e-portfolios in educational settings. Students in this era tend to be more attracted to interactive, visual, and technology-based instructional media. This gives rise to the understanding that e-portfolios are expected to serve as an effective means of enhancing student engagement in learning. Through the use of various digital media such as video, infographics, and/or interactive presentations, students are able to express their understanding in more creative and innovative ways.

Although the potential of e-portfolios in education appears promising, empirical data reveal a somewhat different picture. Data from the Indonesian Ministry of Religious Affairs (2024) on the Competency Assessment of Madrasah Teachers and Education Personnel indicate that only about 38% of madrasah teachers are able to effectively integrate technology into the learning process, with an average pedagogical score below 50 on a scale of 100 (Zukhruf Alfaruqi & Nurwahidah, 2025). These data suggest that the adoption of technology in learning-assessment practices remains far from evenly distributed among Islamic education teachers in Indonesia.

A considerable body of prior research has addressed the topic of e-portfolios. Among these are (Harun et al., 2021) who's examined the pedagogical potential of e-portfolios in teacher-education programmes, along with the issues that need to be addressed, based on a systematic literature review; their findings indicate a positive picture regarding the use of e-portfolios in documenting pre-service teachers' learning experiences, particularly in supporting and evaluating the learning process. Similarly, (Zhang & Tur, 2022) also employing a systematic literature review, identified and further examined articles related to e-portfolios, concluding that longitudinal research on the pedagogical design of e-portfolio implementation is needed in order to yield promising benefits.

Then a research by (López-crespo et al., 2022) that subsequently provided what may be regarded as an indirect response to Zhang and Tur's study; this research specifically aimed to explore the correlation between students' performance on e-portfolios and on other assessment methods, as well as to evaluate the use of e-portfolios over one semester in order to assess changes in effectiveness, with findings indicating an increase in effectiveness following one semester of e-portfolio implementation. Meanwhile, (Syzdykova et al., 2021) designed and developed an e-portfolio within a higher-education system and conducted a survey focusing on its perceived value, with results showing that the e-portfolio provides an appropriate platform for integrative

learning that enables students to visualise the connections among various concepts learned both within and beyond the classroom.

In line with the study by Syzdykova et al., research by (Händel et al., 2018) likewise investigated e-portfolios at the higher-education level; they examined weekly e-portfolio use among university students over one semester and its effect on examination performance, finding that students who used e-portfolios achieved better final-examination results than their peers who did not. Lastly, (Namaziandost et al., 2020) assessed the feasibility of e-portfolio use among English as a Foreign Language (EFL) students in Iran and investigated the potential benefits and challenges of implementing this assessment tool in foreign-language classrooms, reporting that the e-portfolio was favoured by most participants because it provided a clear picture of their learning progress.

The aforementioned studies largely present a positive picture of e-portfolios; nevertheless, several gaps remain unaddressed. First, most of these studies have focused on university students or pre-service teachers as their primary subjects, leaving the perspectives of in-service teachers who are actively teaching in schools relatively underexplored. Second, studies on e-portfolios within the domain of Islamic Religious Education (*PAI*) are relatively difficult to find in the existing literature, given that *PAI* has historically relied more heavily on textual, rote-memorisation, and conventional approaches to both learning and assessment. Consequently, when a *PAI* teacher decides to adopt digital assessment as an evaluation instrument, this decision entails pedagogical and cultural considerations that are not found in other educational contexts. This is what renders the context of *PAI* teachers an object of study that cannot be academically equated with other educational contexts and therefore warrants dedicated investigation.

A final gap concerns the absence of research that specifically employs the Technology Acceptance Model (TAM) as a qualitative analytical framework to understand teachers' acceptance, particularly that of *PAI* teachers of e-portfolios. TAM explains why individuals accept or reject a given technology (Davis, 1989). Within this theory, Davis identified six variables, two of which serve as the primary determinants of technology acceptance: first, Perceived Usefulness (PU), referring to the extent to which an individual believes a technology to be beneficial; and second, Perceived Ease of Use (PEOU), referring to the extent to which a technology is perceived as easy to use. Regarding these two variables, a technology perceived as insufficiently useful and difficult to use tends to be rejected (Venkatesh et al., 2003).

Applying TAM to the context of *PAI* teachers constitutes an academic necessity for two reasons. First, TAM enables an analysis that goes beyond the question of "whether teachers use e-portfolios" to also address the question of "what drives or hinders such acceptance." Second, no study to date has applied TAM qualitatively to *PAI* teachers, meaning that the present study can offer a novel perspective on how the technology-acceptance framework operates within the context of religious education. It is against this backdrop that the present study seeks to fill these gaps by analysing *PAI* teachers'

perceptions of, and acceptance toward, the use of e-portfolios in learning assessment, based on the TAM framework.

Based on the foregoing discussion, this study aims to analyse *PAI* teachers' perceptions of and acceptance toward the use of e-portfolios in conducting learning assessment, based on the TAM framework, at a vocational secondary school in Surabaya, namely *SMK Unitomo*. The selection of this site was not based on the assumption that the entire institution had fully implemented e-portfolios, but rather on the fact that *PAI* teachers at this school had already used e-portfolios as a learning-assessment instrument. This vocational school was therefore selected as the research site because it satisfied the primary requirement of this study, namely the availability of relevant research subjects capable of providing contextual data consistent with the study's focus.

Method

This study employs a qualitative approach in the form of field research with a qualitative descriptive design, as it aims to describe and analyse *PAI* teachers' perceptions of e-portfolio use through data collected directly from informants in order to understand these perceptions (Creswell & Poth, 2023). A qualitative descriptive design was selected because this study does not aim to construct a theory or conduct a case study; rather, it seeks to obtain a detailed picture of *PAI* teachers' perceptions and experiences in using e-portfolios based on the TAM framework. This study focuses on eliciting teachers' perceptions, experiences, and attitudes toward operating technology in education.

A qualitative approach was employed to understand the phenomenon of technology acceptance through the Technology Acceptance Model, in order to analyse how perceived usefulness and perceived ease of use influence teachers' attitudes toward the e-portfolio. The data sources in this study comprised primary and secondary data. Primary data were obtained directly from the informants, the *PAI* teachers who served as the research subjects, through interviews, while secondary data were obtained from supporting documents such as academic journals, books, and policy documents relevant to the research topic. The research instrument in this study was the researcher himself, as is customary in qualitative research.

Data collection was conducted through interviews and observation. The interviews were semi-structured, allowing informants sufficient latitude to convey their experiences and views. The interview guide underwent an expert-judgment process involving a lecturer with expertise in Information and Communication Technology (ICT), to ensure that the interview items were consistent with the constructs of the TAM framework, comprising the two primary variables of Perceived Usefulness and Perceived Ease of Use, as well as the two additional variables of Attitude Toward Using and Actual System Use, while also verifying the readability and clarity of the language used, so that the data obtained from informants would accurately reflect the variables being measured.

The informants in this study were two *PAI* teachers at *SMK Unitomo*, Surabaya, a vocational secondary school affiliated with Unitomo University, Surabaya. The informants were selected using purposive sampling, namely deliberate selection based on

specific considerations and criteria relevant to the research objective (Creswell & Creswell, 2014), with the criteria being: active status as a *PAI* teacher, prior use of digital assessment, and willingness to serve as an informant and to provide information openly. With regard to research ethics, all informants participated voluntarily and provided their consent. Informants were informed of the research objectives and assured that their identities would remain confidential in the reporting of the findings. The data obtained were used solely for academic research purposes and will not be disseminated in any form that could personally identify the informants.

Each interview session was recorded to ensure data accuracy and to capture key points; recording took place only after informants had given their consent. Observation was conducted in a non-participatory manner, with the researcher merely observing ongoing activities without direct involvement. The observation was carried out on 7 May 2026 at the research site, covering one full session of a learning-assessment activity. The aspects observed included the process of operating the digital assessment, the fluency with which teachers operated the system, and the presence or absence of obstacles. The observation results served as supplementary data to verify and strengthen (triangulate) the data obtained through the interviews, thereby safeguarding the validity of the research findings. Credibility was maintained through source and method triangulation, whereby data from interviews and observation were combined so that findings from one source could be verified against the other.

The application of TAM in the analytical process was carried out through a theory-driven thematic-analysis approach. After the interview and observation data had been collected, the researcher conducted a coding process by mapping each unit of data onto one of the four TAM variables that constituted the analytical framework. Data analysis in this study followed the model proposed by Matthew B. Miles and A. Michael Huberman, which comprises three stages: data reduction, data display, and conclusion drawing (Miles et al., 2014). Data reduction was carried out by selecting and focusing on data relevant to the research objective, namely data pertaining to the four TAM variables. Data display was presented in the form of descriptive narratives mapped onto each TAM variable to facilitate understanding of the findings. Conclusions were then drawn by interpreting the analysed data in order to identify the factors influencing teachers' acceptance of digital-assessment use, based on the Technology Acceptance Model (TAM) framework.

Result and Discussion

The Concept of TAM

The Technology Acceptance Model (TAM) framework comprises six variables: External Variables, Perceived Ease of Use, Perceived Usefulness, Attitude Toward Using, Behavioral Intention to Use, and Actual System Use, as illustrated in the figure below

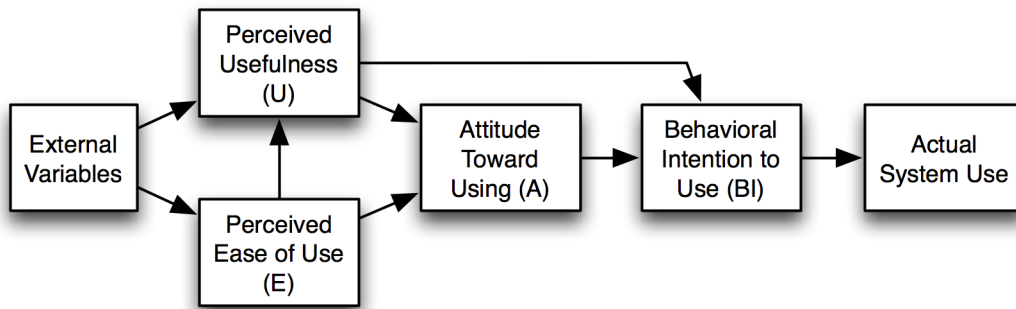


Figure 1. Structure of the Technology Acceptance Model variables

Of these six variables, the present study focuses its analysis on four: Perceived Usefulness, Perceived Ease of Use, Attitude Toward Using, and Actual System Use. The reason for limiting the analysis to these four variables is that TAM was historically developed within a quantitative paradigm; when applied in qualitative research, not all variables need be adopted in full. Scholars such as Straub, Limayem, and Karahanna have argued that adapting a quantitative model to a qualitative approach requires the selection of variables relevant to the context and objectives of the research (Veltmeyer & Sahin, 2014). This approach can therefore be referred to as an adapted TAM, that is, a version of TAM selectively adapted to the research context. This adaptation is grounded in contextual considerations that are academically justifiable.

The External Variables function as antecedents that influence the PU and PEOU variables, such as the characteristics of the training system or users' prior experience (Burton-Jones & Hubona, 2006). Accordingly, External Variables were not treated as a primary variable in this study, because the research focus is not on what factors shape teachers' perceptions, but rather on why and how teachers come to accept the e-portfolio.

The Behavioral Intention to Use variable, meanwhile, functions to measure an individual's intention to use a technology in the future (Almulla, 2024). This variable is relevant when measured at the pre-adoption stage of technology; however, in the context of this study, the *PAI* teachers investigated had already been shown to use the e-portfolio in actual practice. Measuring usage intention among subjects who are already active users is therefore redundant and lacks significant analytical value, as Venkatesh and Davis explain that behavioral intention is most relevant when measured at the pre-adoption stage (Alharbi & Drew, 2014) (Aljarrah et al., 2016).

Based on the interview results, *PAI* teachers' perceptions of e-portfolio use at SMK Unitomo were analysed through the variables of Perceived Ease of Use, Perceived Usefulness, Attitude Toward Using, and Actual System Use within the TAM framework. The findings indicate that both informants held positive perceptions of e-portfolio use in the learning-assessment process.

Ease of E-Portfolio Use from the Perspective of PAI Teachers

Briefly, Perceived Ease of Use (PEOU) is one of the six variables within TAM that measures the degree of ease individuals experience in using a given technology (Venkatesh & Davis, 2000). However, because this study is qualitative in nature, PEOU

was identified through patterns in informants' narratives reflecting their experiences interacting with the e-portfolio system, rather than through numerical measurement, and was further confirmed through behavioural observation conducted on 7 May 2026.

With respect to the Perceived Ease of Use variable, the interview findings show that both informants held positive perceptions of the ease of using the e-portfolio in the learning-assessment process. The first informant (G1) explained that using technology was no longer unfamiliar to him, as technology had become part of his daily activities. As G1 stated:

“The use of the e-portfolio is very easy, because using technology has already become part of my daily routine.” (G1, 7 May 2026)

This statement indicates that the sense of ease experienced by G1 stemmed from digital literacy that had already been established prior to his use of the system. This is consistent with (Davis, 1989), proposition that PEOU is influenced by users' prior experience, whereby individuals accustomed to technology tend to perceive new systems as non-threatening and easy to master. This finding also extends the argument put forward by (Harun et al., 2021) who stated that e-portfolio acceptance is influenced by digital readiness. The observation empirically reinforced this narrative: G1 was observed opening the system, accessing the list of students, and entering grades smoothly, without requiring assistance from others and with a sense of calm.

The second informant (G2) expressed a similar view, adding an interesting dimension of social comparison. She stated:

“I feel more confident assessing using the e-portfolio system, because I can see that some other teachers are still using the conventional method.” (G2, 7 May 2026)

G2's statement demonstrates that a sense of ease can also be constructed through social comparison with colleagues. This is consistent with the concept of social influence in the technology-adoption literature (Venkatesh et al., 2003), which asserts that users' perceptions of a technology are also shaped by their social environment. The successful adoption of the e-portfolio reinforces PAI teachers' professional identity as educators who are adaptive to change. This was likewise confirmed through observation, in which G2 was seen operating the system with a similar level of proficiency, without encountering any obstacles.

Nevertheless, both informants acknowledged having encountered certain technical issues. G1 had experienced a system failure while entering students' examination numbers, while G2 had once lost an assessment file. According to (Davis, 1989), such obstacles theoretically have the potential to lower PEOU; in practice, however, this was not the case. Both informants instead regarded these obstacles as temporary and resolvable technical issues, rather than as indications that the assessment system was fundamentally difficult to use. This pattern suggests that a strongly established perception of ease, built through repeated use, exhibits resilience to incidental technical obstacles, a finding that has received relatively little attention in the existing literature on the PEOU variable.

The findings of this study indicate that the level of Perceived Ease of Use toward the e-portfolio can be classified as positive. This positive perception is evident in the informants' ability to operate the digital system, their confidence in using the technology, and the absence of any significant resistance or rejection toward e-portfolio use in learning assessment. Based on this analysis, it can be concluded that the e-portfolio system used for assessment was perceived as easy to use, notwithstanding certain technical obstacles.

Usefulness of the E-Portfolio as a Learning-Assessment Instrument

Briefly, Perceived Usefulness (PU) is a variable within TAM that measures the degree of usefulness or benefit that individuals perceive a given technology to provide (Venkatesh et al., 2003). In this study, PU was analysed based on informants' narratives regarding the impact of the e-portfolio on their assessment practices as *PAI* teachers.

Both informants consistently reported that the e-portfolio provided benefits directly felt in their work. G1 emphasised time efficiency and system integration, stating:

“For me, using the e-portfolio is more effective than the conventional assessment method, because I feel that the process of collecting assignments, checking students' work, and entering grades can all be done within a single integrated system, which makes it more efficient.” (G1, 7 May 2026)

G1's narrative indicates that the benefit of the e-portfolio is experienced as a comprehensive transformation of the assessment workflow, with teachers moving from a fragmented method to a process integrated within a single platform. This finding aligns with that of (López-crespo et al., 2022), who reported increased effectiveness following one semester of e-portfolio implementation; the present study, however, adds a novel insight in that system integration emerges as the most salient aspect of PU within the context of *PAI* teachers, an aspect not addressed in López-Crespo et al.'s study. This was confirmed through observation, in which the researcher witnessed G1 complete an assessment, from opening the list of students and checking their work to entering grades, within a single session, without needing to switch platforms or use any physical documents.

G2 reinforced this finding from the perspective of the systematisation of evaluation, stating:

“For me, using the e-portfolio greatly facilitates the evaluation of learning outcomes, because it can be done more practically and systematically.” (G2, 7 May 2026)

G2's use of the word "systematic" reflects a deeper pedagogical awareness, indicating that the e-portfolio serves as an instrument that enhances the quality of the evaluation process. This is consistent with (Lu, 2021), who states that the e-portfolio renders the assessment process more organised. Within the domain of *PAI*, where assessment frequently involves attitudinal aspects that are difficult to quantify, the e-portfolio's ability to document students' progress on an ongoing basis constitutes an added value. During the observation, G2 was seen using the assessment feature to monitor the distribution of class achievement, a behaviour that directly reflects the pedagogical awareness she expressed in the interview.

Overall, the narrative patterns of both informants reflect a strong and consistent PU variable. This finding reinforces the core argument of TAM, namely that perceived usefulness is the primary determinant of technology acceptance (Davis, 1989), while also demonstrating that *PAI* teachers experience the benefits of the e-portfolio functionally, through reduced administrative burden and improved quality of assessment management. These findings indicate that Perceived Usefulness toward the e-portfolio is highly positive.

This positive perception of usefulness constitutes one of the factors driving teachers' acceptance of e-portfolio use in the assessment process. The greater the benefit perceived by users, the greater their tendency to accept and make use of the technology in teaching and learning activities.

PAI Teachers' Attitude Toward E-Portfolio Use

Within the TAM framework, the Attitude Toward Using variable occupies a fairly central role, functioning simultaneously as both mediator and predictor in the technology-adoption process. This complex function has a significant impact on how a technology is accepted and applied in practice. Attitude Toward Using acts as a mediator between Perceived Ease of Use and Intention to Use, reflecting a critical relationship in which Perceived Usefulness directly enhances users' perception of a technology's benefits, which in turn shapes a positive attitude toward its use. Such a positive attitude is crucial, as it reinforces users' intention to adopt a given technology (Or, 2024).

Positive perceptions of the ease and usefulness of the e-portfolio shaped teachers' positive attitudes toward the use of technology in assessment. Based on the analysis of interview and observation data, both informants exhibited positive attitudes toward e-portfolio use. Neither informant displayed any rejection of or reluctance toward the e-portfolio; on the contrary, both regarded technologies such as the e-portfolio as a means capable of supporting and enhancing the effectiveness of learning activities.

This positive attitude, in turn, gave rise to an intention to continue using the e-portfolio in future assessment activities. The informants felt that using the e-portfolio was highly beneficial and helped improve their work efficiency as teachers. In addition, e-portfolio use was regarded as relevant to the current development of technology in education, in an era in which nearly everything has become digital.

These findings indicate that positive perceptions of technology can shape users' tendency to continue utilising that technology in their instructional practice. It can therefore be said that teachers' acceptance of the e-portfolio is influenced by technical factors as well as by their perceptions of the benefits and ease of use of the e-portfolio technology.

This finding is noteworthy because it shows that the positive attitudes of both informants were formed within a professional context historically grounded in conventional methods. *PAI* teachers integrated e-portfolio use into their professional identity as educators who are technologically literate. This contrasts with the findings of (Namaziandost et al., 2020) among EFL students in Iran, where e-portfolio acceptance was driven by learning-motivation factors, whereas in the present study, *PAI* teachers'

positive attitudes were driven more by considerations of work efficiency. This difference suggests that Attitude Toward Using an e-portfolio is formed through different pathways depending on the role of the user.

The observation findings further reinforce this through the behaviour of both *PAI* teachers. During the assessment sessions, both teachers were seen operating the system calmly and independently, without displaying any signs of confusion. The observed pattern of interaction with the system reflects a level of comfort formed through repeated use, an indicator of Attitude Toward Using that could not have been captured through interview data alone.

Actual Use of the E-Portfolio in Assessment Activities

Within TAM, Actual System Use constitutes the final dependent variable, measuring the real-world implementation of a technology based on the intensity, frequency, and duration of a user's interaction with the technological system. This variable serves as the primary indicator for determining whether the utilisation of a technological system has been successful. It is typically measured through two main steps: first, examining how frequently an individual accesses or interacts with the system within a given period; and second, observing the duration of use, such as the exact or estimated amount of time users spend within the system during each interaction session (Wang et al., 2025).

In quantitative research, this variable is typically measured through surveys in which respondents report how often and for how long they use the system within a given period. In qualitative research, however, the operationalisation of Actual System Use must be adapted. Rather than measuring frequency numerically, this study identified actual use through qualitative indicators developed from TAM's theoretical propositions. These include: the depth of procedural knowledge, namely informants' ability to describe the system-use workflow in detail, which can only be acquired through direct experience; the consistency of use within the scope of practical implementation, namely evidence that the e-portfolio is used as part of the routine assessment process; and, finally, behavioural verification through direct observation, namely empirical confirmation that the use described in the narratives actually occurred in the field. This adaptation of indicators is consistent with the view of (Creswell & Poth, 2023) who argue that in qualitative research, theoretical constructs that are inherently quantitative in nature need to be translated into forms of behavioural evidence and narrative that can be intersubjectively verified.

Based on these indicators, evidence of Actual System Use was strongly identified for both informants. In terms of procedural knowledge, G1 was able to describe in detail how the e-portfolio was used for three assessment stages integrated within the same platform. G2 further added that the system was also used for the regular and systematic evaluation of learning outcomes. The degree of detail in both informants' narratives indicates that this usage was repeated and had become part of their routine work as *PAI* teachers.

The triangulation of interview narratives and observed behaviour produced a systematic and mutually reinforcing picture. The fact that both *PAI* teachers had reached the stage of actual use indicates that the entire technology-acceptance process within the TAM model had functioned effectively. This further affirms the relevance of the adapted TAM as an analytical framework capable of explaining patterns of technology adoption within the domain of Islamic religious education.

The results of the analysis indicate that e-portfolio use is capable of supporting a more effective, flexible, and organised assessment process compared with conventional methods. Aligning technological advancement with assessment activities helps teachers reduce their administrative burden while simultaneously improving the efficiency of managing students' learning outcomes.

Synthesis of Findings on E-Portfolio Acceptance Patterns within the TAM Framework

The following table presents a summary of the analysis of the interviews and observations conducted with the two *PAI* teacher informants:

Table 1. *Convergence of the TAM Analysis Findings*

Variabel	Findings for G1	Findings for G2	Synthesis
<i>Perceived Ease of Use</i>	Ease of use formed through habitual technology use; technical obstacles did not alter perceptions; confirmed through observation of independent system operation	Ease of use reinforced by social comparison with colleagues still using conventional methods; confirmed through observation.	A strong and resilient perception of ease, shaped by digital literacy and the social domain.
<i>Perceived Usefulness</i>	Benefit felt in the integration of the assessment workflow within a single system; confirmed through observation of the usage workflow.	Benefit felt in the systematisation of evaluation; confirmed through system utilisation.	The usefulness of the e-portfolio is consistently acknowledged as improving the quality and efficiency of teachers' work.
<i>Attitude Toward Using</i>	Positive attitude formed through usage experience; no rejection observed; confirmed through observed attitude while using the system.	Positive attitude reinforced by professional relevance.	A consistent positive attitude, formed through personal conviction.
<i>Actual System Use</i>	Demonstrated direct use of the e-	Demonstrated direct use of the e-	Both teachers were confirmed as active

portfolio teaching and learning activities, evidenced by detailed procedural narratives and direct observation of assessment sessions.	in portfolio in teaching and learning activities, evidenced by detailed procedural narratives and direct observation of assessment sessions.	users of the e-portfolio technology, strongly verified through the triangulation of interviews and behavioural observation.
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The table above summarises the findings across the four adapted TAM variables that constitute the analytical framework of this study. Several key points emerge from the table. First, there is strong convergence in the findings between G1 and G2 across all variables. Although the two teachers had slightly different backgrounds of experience and motivation, both ultimately converged on a substantially similar pattern of acceptance. This convergence enhances the credibility of the findings, given that the data, obtained from two sources, yielded mutually reinforcing conclusions.

Second, the table shows that the process of technology acceptance among *PAI* teachers is systemic in nature: perceptions of ease and usefulness develop through repeated, direct usage experience. This has a significant implication, policy interventions aimed at increasing e-portfolio adoption among *PAI* teachers would be more effective if focused on providing opportunities for hands-on practice. Finally, the achievement of Actual System Use by both informants confirms that the entire TAM process functioned fully within this study. This demonstrates that a selectively adapted TAM can still account for the phenomenon of technology adoption in qualitative research, while also opening avenues for further research to test a similar model among a broader and more diverse group of *PAI* teacher informants.

Conclusion

This study aimed to analyse *PAI* teachers' perceptions of and acceptance toward the use of e-portfolios in learning assessment at SMK Unitomo Surabaya, based on the TAM framework. Based on the analysis of the four TAM variables, Perceived Usefulness, Perceived Ease of Use, Attitude Toward Using, and Actual System Use, it can be concluded that *PAI* teachers at SMK Unitomo Surabaya accept the presence of the e-portfolio positively as a learning-assessment instrument. This acceptance arose from the teachers' repeated experience in using the technology, which gradually and consistently shaped their perceptions of ease, perceptions of usefulness, positive attitudes, and, ultimately, actual system use.

More specifically, *PAI* teachers' acceptance of the e-portfolio is influenced by two mutually reinforcing key factors. First, a high level of Perceived Usefulness, felt through the efficiency of the assessment workflow, the integration of the assessment process within a single platform, and the systematisation of students' learning-outcome evaluation. Second, a high level of Perceived Ease of Use, formed from teachers' pre-existing technological understanding and reinforced by social comparison with

colleagues who still use conventional methods. These factors jointly shaped a positive Attitude Toward Using, which in turn culminated in Actual System Use, verified through the triangulation of interview and observation data. These findings affirm the relevance of TAM as an analytical framework capable of explaining the phenomenon of technology adoption within the domain of Islamic religious education.

Nevertheless, this study has a number of limitations that must be openly acknowledged. First, the limited number of informants, only two from a single school, means that the findings cannot be directly generalised to a broader context. Second, this study did not examine the full set of TAM variables, meaning that external factors potentially influencing technology acceptance have not been further analysed. A further limitation is that observation data were collected during only one assessment session, meaning that the long-term consistency of e-portfolio use cannot be fully ascertained.

In light of these limitations, future research is encouraged to expand both the number of informants and the range of research sites in order to obtain a more representative picture of PAI teachers' acceptance patterns toward e-portfolios in Indonesia. Furthermore, future studies could consider employing the full set of TAM variables, or combining qualitative and quantitative approaches (mixed methods), to produce more comprehensive and statistically testable findings. Research into external factors such as policy support, the availability of technological infrastructure, and digital-literacy training programmes for PAI teachers also constitutes an important agenda for future investigation.

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