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Parental engagement and academic transparency through mobile information systems in vocational education

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ABSTRACT

The manual management of teacher journals, agendas, and student attendance in Indonesian vocational schools (SMK) often limits real-time information access for parents, resulting in one-way communication and limited academic transparency. This study aimed to develop and evaluate DIJAGA, a mobile-based academic information system integrating teacher journals, student attendance, and parental monitoring. The Research and Development (R&D) method using the ADDIE model was employed. The study involved one media expert, two content experts, 43 teachers, 124 parents, and attendance data from 180 students. Data were collected through expert validation, practicality and effectiveness questionnaires, and a one-group pretest-posttest attendance assessment. The results showed high validity, with mean Aiken's V values of 0.833 for media and 0.816 for content. DIJAGA was considered practical by 95% of teachers and 91% of parents, while the effectiveness score reached 80.41%. Student attendance increased from 87.22% to 92.05%, with a significant paired-samples t-test result, $t(179) = 6.975$, $p < .05$. The N-Gain score was 0.378 (moderate), and Cohen's d was 0.520 (moderate). These findings indicate that DIJAGA is a valid, practical, and potentially effective system for improving academic transparency, parental trust, communication, and student attendance. However, because the study used a one-group pretest-posttest design without a comparison group, the findings should be interpreted as exploratory evidence of feasibility rather than definitive causal evidence.



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Introduction

The advent of digital transformation has revolutionized the way schools store data, interact stakeholders, and track learning progress. Mobile devices especially have moved record keeping from paper to computer-based real-time records in a system accessible not only by teachers but also by students' parents. A movement such as this mirrors that of a general society expectation where schools not only carry out academic activities but also serve as transparent information centers capable of maintaining trust between the institutions and the parent community. Recent scholarship on school management information systems corroborates this shift toward integrated, real-time digital record-keeping (Nursodiq, 2025).

Schools for Vocational Education-SMSV in Indonesia-have to rely on data when managing academic stuff, which makes this requirement very urgent for them. Vocational schools must monitor at the same time theoretical training, practical skill development, and behavioral traits like punctuality and presence. The latter are considered as key indicators and are directly linked to workplace readiness. It has been suggested that the introduction of digitalization in these managerial processes is a means to enhance the functions that guarantee quality and are characteristic only of the vocational education system.

Though vocational schools have great scope for innovation, many of them still use outdated ways of keeping track of their staff's schedules and student attendance (Nursodiq, 2025). Parents only get the information indirectly, often via the students themselves. Such practice can lead to delayed or incorrect information, and lack of responsible for the teaching activities, besides depriving the parents of the opportunity to find out independently whether their kids are attending classes and being involved in the lessons, without relying on their children's statements (Basri et al., 2020).

It is well-established amongst educators and researchers that parental engagement plays a key role in influencing the outcomes of the students (Epstein, 2011). This relationship is corroborated by more recent research on parental involvement (Antony-Newman, 2024; Guo & Keles, 2024). This form of engagement comprises the parental involvement in facilitating and guiding the child's learning and the development of an open two-way channel of communication between the parents and the school. In cases where there's an imbalance in or a low level of communication, the ability of parents to enforce disciplinary measures and regularity in school attendance gets hampered (Antony-Newman, 2024; Guo & Keles, 2024), whereas the school also misses out on one of the significant players in the shaping of the pupil's conduct behavior.

Mobile-based educational information systems are seen as an effective way of dealing with the problems created by the communication channels. When parents are able to view their child's classroom attendance and academic performance live through the system, not only does one have the freedom from the mediation of a student to report, but also the level of confidence in how accurate, fast, and reliable school information is increased (Amelia et al., 2023; Ariani et al., 2022). Among these two concepts, Perceived ease of use and perceived usefulness are the key elements of the Technology Acceptance Model (Davis, 1989), and they can reliably indicate, without any doubt, that this kind of systems are likely to be used by teachers, and the parents in their real-life contexts.

Recently published studies shed light on how digital solutions for such tasks have evolved and are being utilized at present time. Jeremiah and Mtebe (2018) noted that a digital-diary app was highly appreciated by teachers and parents in situations where agendas and attendances were involved and were almost the same. The group of Rohman et al. (2025) pointed out that a school-level educational information system not only significantly decreased the processing time but also increased the involvement of parents. The results of Eliza et al. (2024) study showed that Android-based learning apps developed with the use of the ADDIE model achieved very high scores for face, and expert validity. To the contrary, Banic and Orehovacki (2024) focused on aspects where parents' experiences with school digital platforms revealed both relational and emotional dimensions.

However, these limitations appear at the same time in this corpus of literature. To start with, few researches merely consider the use of a digital attendance register or a teacher's appointment agenda and do not connect these features through the platform to parental monitoring (Basri et al., 2020). Most importantly, many investigations involve only two stakeholders at a time normally the creators and teachers, or the teachers and students instead of combining the four entities: the school management, teachers, students, and the parents in one system (Rohman et al., 2025). Additionally, most of the research in the field of development is limited to technical feasibility, usability, or level of acceptance. These researchers generally stop before measuring outcome effects, for instance, significant change in student attendance is identified through inferential statistics (Ancheta et al., 2021; Eliza et al., 2024); while some studies do mention attendance, they are likely treating it as a system feature than an independent variable which a proper pre-post analysis is applied.

This research has filled those aforementioned gaps by the way of a comprehensive implementation and evaluation of a DIJAGA, an academic mobile system capable of teacher-agenda journaling, student-attendance tracking, and parental monitoring features, which can be used simultaneously by school administration, teachers, and parents of students at a vocational school. This research unlike the ones that focused only on the usability aspect have, however, combined professional review, practicality check with two stakeholder groups, and an assessment of effectiveness through a multifaceted questionnaire and a paired-samples comparison of attendance data before and after the system was implemented. The target population comprised teachers, parents, and students in Grades X and XI at a single vocational high school (SMK) in Indonesia, a site purposively selected because it exhibited the manual, paper-based journaling and attendance practices described above; full sampling criteria and procedures are reported in the Method section.

The paper has three main findings. First, it shows how all four parties involved, school administrator, teaching staff, pupils as well as parents can collaborate using one mobile app instead of only teacher-student or teacher-parent communication tools. Secondly, it offers strong analytical evidence (a paired t-test, a N-Gain, and a Cohen's d) for the rise in attendance which means it goes beyond a mere description on a conceptual level through perception data. Finally, it puts this evidence base in contrast to the very few academic discussions on the issue of absenteeism in the environment of vocational education which in itself has quite a special nature because the attendance records and the discipline have a very important role in determining whether a pupil is ready for the workplace.

In essence, this paper investigates the creation and the validation of the DIJAGA mobile app which were developed through the ADDIE model by means of the following four research questions which guide us: what are the academic and management issues that justify or call for development of an integrated mobile-based teacher-journal and student attendance tracking system at the vocational school level? (RQ2) How can a system of this kind be created systematically, by making use of the ADDIE model? (RQ3) Up to what extent is the developed mobile app valid and useful both in a practical and educational senses of the terms for the teachers and the parents? (RQ4) By how much does the rollout or adoption of the system contribute to bettering not only the students' attendance records but also stakeholders' views regarding academic transparency, parents' trust in the school, and students' discipline behavior?

Method

Research design

This paper employed a research and development (R&D) design aimed at producing and empirically testing an educational product. This was according to Borg&Gall's (1983) conceptual framework of R&D as a strategy of developing and validating educational products for use at a practical level. The product being developed was DIJAGA, an academic information system based on mobile devices. Within this broader R&D framework, the ADDIE model served as the specific procedural operationalization of Borg and Gall's develop-and-validate cycle, providing the step-by-step stages through which the product was iteratively built, tested, and refined (see Development model, below).

Development model

Development went hand in hand with the ADDIE model (Branch, 2009), namely, Analysis, Design, Development, Implementation, and Evaluation. ADDIE was chosen due to its structured and yet iterative nature that allowed for changes at each level based on assessment and feedback of the end users. The method matched the practical, product-oriented character of this study. The instruments used to gather feedback at each ADDIE stage, together with their validation and reliability evidence, are detailed in the Instruments subsection below.

Research setting and participants

This was a collaborative effort between our research institute and SMK Negeri 2 Kerinci in Indonesia. The total population of the student body was 251 (Grade X = 104; Grade XI = 76; Grade XII = 71). However, Grade XII has been excluded from this study because these senior students are under preparation of the competency and final school examinations. Therefore, only Grade X and XI students (a total of 180) were taken as a population sample, which corresponded to 180 parents (one parent per student). The staff population that taught Grades X and XI totaled 48. A population sample consisting of 43 teachers in addition to 124 parents was obtained using the Slovin formula (5% error margin as the maximum allowable error). Student attendance records of the full 180 were employed as the objective outcome measure rather than a population survey sample. Table 1 presents research subjects. A 5% margin was adopted as it is conventional for survey-based educational research at this scale and was judged to balance sampling precision against practical data-collection constraints. Because Grade XII students and their parents fell outside the sampling frame, the findings speak most directly to the Grade X-XI population and may not generalize to the graduating cohort (see Limitations).

Table 1. Participant Characteristics

Participant Group	N	Role in the Study
Media expert	1	Validated technical aspects: system functionality, security, usability, interface and UX design
Content experts	2	Validated content alignment with academic needs, school policy, and discipline/honesty indicators

Participant Group	N	Role in the Study
Teachers	43	Primary users; entered agenda journal and attendance data; completed the practicality questionnaire
Parents	12	Used the application to monitor attendance and academic activity; completed the practicality and effectiveness questionnaires
Students	18	Unit of analysis for attendance data (Grades X-XI); supporting evidence for effectiveness, not a questionnaire sample
(population)	0	

Product development procedure

During the Analysis phase, the researcher studied the existing paper-based system for registering teacher journals and student attendance and realized the lack of a communication channel between school and parents, and communication is happening from one side only and delayed. Design phase defined the technical architecture, system navigation, and interface components from the viewpoints of teacher, parent, and administrator. In the Development phase, the application was coded first, and, after that, its validation was done with the help of media/content experts; the changes suggested by validators caused three different revision cycles of changes, that is, one for each of the most criticized aspects found by validators during evaluation (the full description of these aspects can be found in the Results and Discussion chapter). In the Implementation phase, teachers and parents were introduced to this system by means of a mini socialisation/training session, after which the teachers began to use the system for recording their schedules and attendance, and parents started using it to get information on their children's performance; the next step was giving out practicality questionnaires. In the Evaluation period, we have both a kind of evaluation that takes place all over development phases, i.e., formative evaluation, and an overall assessment of what we called validity, practicality, and effectiveness through our post-implementation summative evaluation.

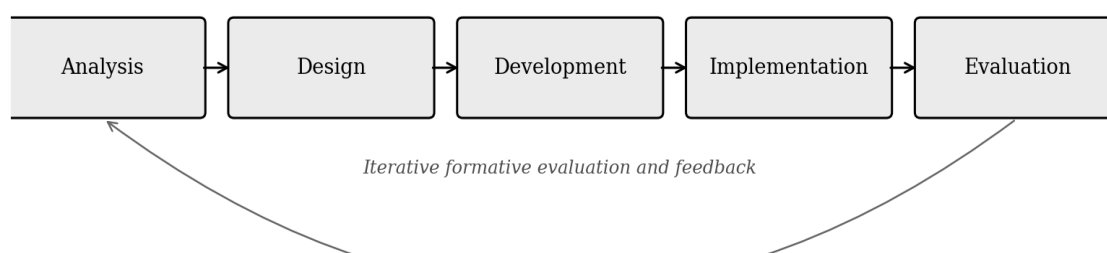


Figure 1. ADDIE Development Procedure Applied to the DIJAGA Application

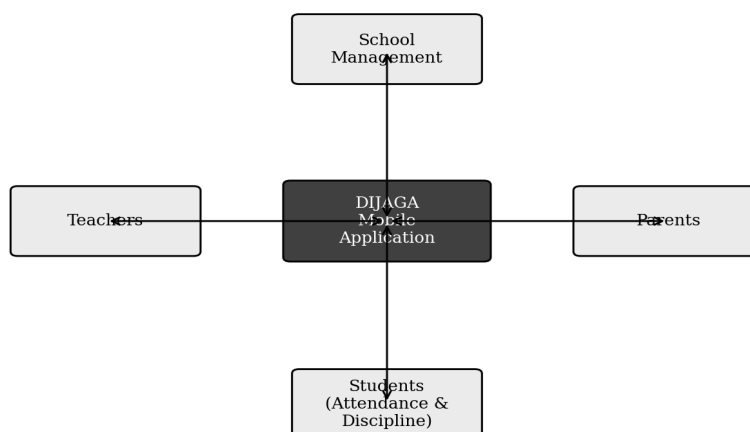


Figure 2. Conceptual Framework: An Integrated Mobile Academic Information System Linking School Management, Teachers, Parents, and Students

Instruments

There were five types of measuring instruments which the researchers had used: (1) the expert validation instrument which was content-validated and the reliability assessed with Aiken's V content validity index; (2) a 10-item teacher practicality (how practical the method of delivery was for teachers) questionnaire; (3) a 10-item parent practicality questionnaire; (4) 25-question effectiveness questionnaire, five areas: the visibility of

academic curriculum, trust on the schools from the side of the parents, school discipline by students, communication between parents and school, and ease of use of the application, measured using a five-point Likert-type(5) School attendance records of Grades X and XI, collected in Both Before and After stages of the program implementation. All To the point of item content validity the item-product-moment correlation method was used to validate the question items against a critical level of $r = 0.361$ ($\alpha = 0.05$, $n = 30$). The analysis showed the item-total correlations ranging from .414 to .839, indicating that all 45 items of the three questionnaires were valid. With Cronbach's alpha the reliability coefficient of the instrument measured was .875 for the teacher practicality questionnaire .852 for the parent practicality questionnaire and .925 for the effectiveness questionnaire (Overall Mean Alpha = 0.884) which were all considered as very high (Arikunto, 2013). For the expert-validation instrument, no pilot test or formal inter-rater agreement statistic (e.g., Cohen's kappa) was computed beyond the mean Aiken's V across raters; this is acknowledged as a methodological limitation (see Limitations).

Data collection

Expert validation data were taken only once during Development. On the other hand, Practicality data were gathered from both teachers and parents after an application period during Implementation. Effectiveness data were the same post-implementation questionnaire responses as a data source, while the attendance data were retrieved from the school records for periods immediately before and after DIJAGA was rolled out.

Data analysis

The expert-validation scores were quantitatively analyzed using Aiken's V that further was judged alongside validity criteria of a regular scale (Kline, 1986). The data on practicality and effectiveness, in contrast, were presented by percentages and category labels. We performed a paired-samples t-test on two-tailed at $\alpha = .05$ to measure the difference between the attendance rates before and after the implementation. Further investigation of the level of change was carried out with the N-Gain index (Hake, 1999), and for paired data Cohen's d effect size indicator (Cohen, 1988). Microsoft Excel handled all statistical work. The source research did not include any statistical procedures beyond those that were mentioned, such as normality testing, moderation analyses of subgroups etc., so the absence of those analyses is also reflected in this paper without mentioning them.

Results and Discussions

Needs analysis

Needs analysis revealed that SMK Negeri 2 Kerinci was still keeping records of teachers' agenda journals and students' attendance manually and these were nowhere connected to parents in real time. Parents were only updated about the school activities in one-way communication and hence had to depend on their children for informing them about attendance and activity in their children's class. From these it was evident that a mobile academic information system was needed which could provide a transparent channel for communication between school administration, teachers, students, and parents on the same platform.

Development of DIJAGA

After implementing the suggested ADDIE procedure in the Method section, we created DIJAGA, a smartphone app that consolidates three different areas, namely, teacher agenda journaling, student attendance recording, and real-time parental monitoring. Ultimately, this conceptual structure allows school management, teachers, and parents to become data providers and viewers around a common student attendance and discipline log (Figure 2).

Expert validation

The media expert gave a mean Aiken's V rating of 0.833 for the application whereas the two content experts gave a mean of 0.816; both these scores are categorized as valid. Validator feedback has pinpointed three aspects with relatively low scores-the media-validation's "use" aspect for filter functions (0.750), content-validation's "clarity of material" aspect, which had the lowest score among all rated aspects (0.709), and media-validation's "display" aspect related to the attendance recap view (0.750). As noted in the Method, no separate inter-rater agreement statistic (e.g., Cohen's kappa) was computed for the two content experts; the mean Aiken's V was used as the summary validity index.

Table 2. Expert Validation Results

Validator	Mean Score	Category
Media expert (n = 1)	0.833	Valid
Content experts (n = 2)	0.816	Valid

Note. Scores are Aiken's V content-validity indices; category thresholds follow the criteria adopted in the source study.

Practicality evaluation

Overall, 95% of the teachers found the app practical (95% for ease of use, 96% for time efficiency, and 93% for operational practicality), whereas 91% of the parents agreed with us overall (90% for ease of use, 91% for time efficiency, and 92% for operational practicality). Both of the total scores are extremely practical.

Table 3. Practicality Results for Teachers and Parents

Aspect	Teachers (%)	Parents (%)
Ease of use	95	90
Time efficiency	96	91
Operational practicality	93	92
Overall (category)	95 (Very practical)	91 (Very practical)

Effectiveness evaluation

A total of 167 respondents (43 teachers and 124 parents) completed the effectiveness questionnaire (25 items, 5 dimensions) and the majority of them fell into the category of "effective." The overall scale mean score for effectiveness questionnaire was 4.02 on five-point scale with a corresponding 80.41%. The Teachers mean score came out to be 4.00 (79.98%) whereas for the parents it was slightly higher, at 4.03 (80.55%). When it came to different dimensions, their performance scores lay within the range from 78.60% to 81.95%. The highest score was given to academic information transparency by the teachers (81.95%) while student discipline received 80.74% from both teachers as well as parents equally.

Table 4. Effectiveness by Dimension

Dimension	Teachers (%)	Parents (%)	Category
Academic information transparency	81.95	80.90	Effective
Parental trust in the school	78.60	80.71	Effective
Student discipline	80.74	80.74	Effective
School-parent communication	79.16	79.65	Effective
Ease of application use	79.44	80.77	Effective

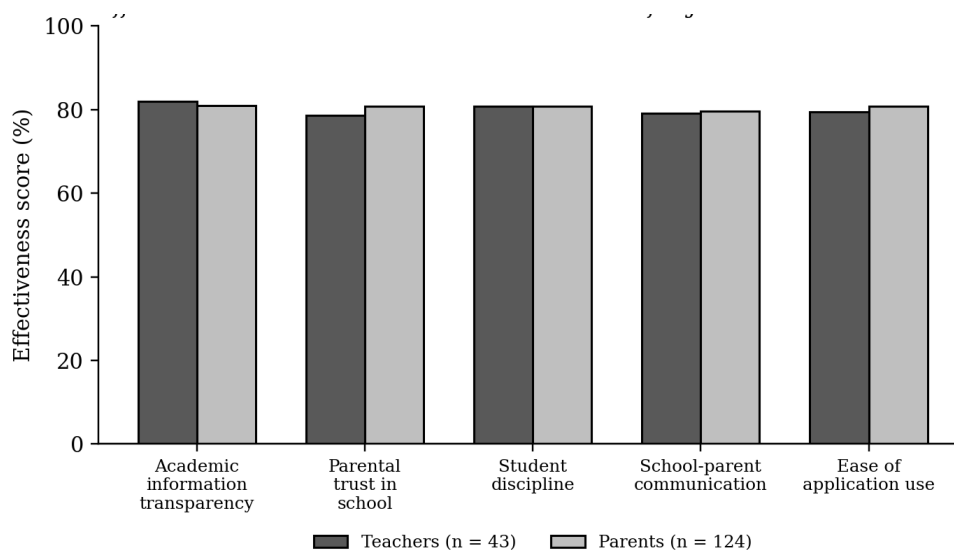


Figure 3. Effectiveness Scores Across the Five Dimensions of DIJAGA (Teachers n = 43; Parents n = 124)

Attendance outcomes

In Grades X and XI (N = 180), the number of absent students decreased following implementation of DIJAGA, resulting in a significant increase in attendance from 87.22% to 92.05% which was a gain of 4.83 percentage points (approximately 5.54% increase relative to the original level).

Table 5. Pre- and Post-Implementation Attendance Results

Period	Students (n)	Attendance (%)	Category
Before DIJAGA	180	87.22	Effective
After DIJAGA	180	92.05	Very effective

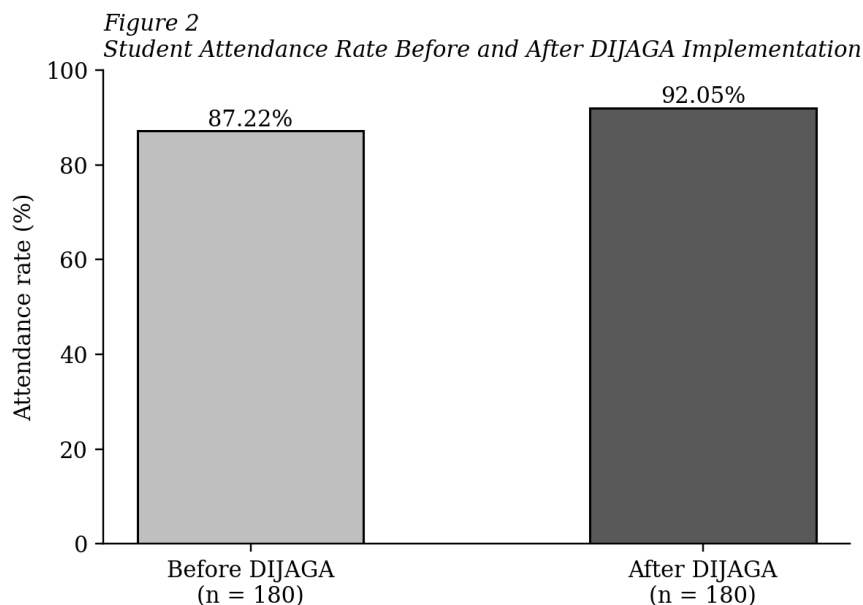


Figure 4. Student Attendance Rate Before and After DIJAGA Implementation

The paired-samples t-test showed a significant improvement in attendance before and after the implementation ($t = 6.975$, $p < 0.05$). The N-Gain score was found to be a moderate 0.378 according to Hake (1999), while Cohen's d also revealed a moderate change in 0.520 according to Cohen (1988). This means that the change is both statistically and practically significant, although it is not a very major change.

Table 6. Paired-Samples t-Test and Effect-Size Results for Student Attendance

Statistic	Value
df	179
t-table ($\alpha = .05$, two-tailed)	1.973
t-observed	6.975
Decision	t-observed > t-table - significant, $p < .05$
N-Gain (category)	0.378 (moderate)
Cohen's d (category)	0.520 (moderate)

Perceived academic transparency, parental trust, and student discipline

At the item-level, results across 25 questions (averages ranged from 3.92 to 4.17 out of five) largely confirmed dimension-level results. Issues like real-time access to student attendance, the accuracy of school records, and the honesty and responsibilities of students were rated significantly higher on the average (3.99-4.17), but follow-up communication and overall satisfaction after visits did not reach as high ratings (around 3.92-3.96) although still indicating the level of effectiveness. Together, the attendance results and this data suggest that from both perception and objective data, it can be argued that DIJAGA contributes to more transparency, trust, and discipline outcomes.

Validity of DIJAGA

The very high scores for content validity from the media expert (0.833) and content experts (0.816) suggest that the application interface, navigation, and content are considered adequate for the intended users before testing. This result is in line with Eliza et al. (2024)'s findings, where they found validity scores similarly high (about 80 %) for an Android app developed through identical ADDIE model steps. They indicated that such a methodical developmental phase of the application product validated by experts is probably the reason behind valid and useful mobile products in education, not just for learning-content applications. That three of the aspects that came as lowest scores during validation namely, the filtering function, content clarity, and attendance recap screen were each resolved in the revised versions and the revised interface was used, it implies that, apart from simply being an admission step to the development process, expert validation was acting as a tool for step-by-step improvement of the product. While these validity scores are consistent with related mobile-education systems, such as Rahaman et al.'s (2025) Wi-Fi-based attendance platform, a broader benchmarking against the wider body of mobile academic-system validation studies was beyond the scope of the present evaluation and is noted as a limitation.

Practicality for teachers

Teachers gave DIJAGA top marks for practicality, with 95% of them doing so and 96% of them citing, in general terms, that the system relieved administrative duties as well as saved time when taking agendas' and attendance records with regard to the paper-and-pencil method. This discovery supports the notion that digital agenda systems cut down on paperwork as well as free-up time for teaching-related tasks (Jeremiah & Mtebe, 2018; Rohman et al., 2025). The somewhat lower performance score regarding the usefulness of system operations (93%) may point to the idea that even though the teachers basically found the system easy to handle (at the level of principle), some of them, for instance, the filters for class, subject or day, have not been completely perfected yet. Because the practicality questionnaire was self-reported by the same teachers who used the system, the high approval rate (95%) may be inflated to some degree by social-desirability bias; this possibility is acknowledged as a limitation of the practicality evaluation.

Practicality for parents

Parents found the use of applications to be very practical (91%) because it offered immediate availability for monitoring attendance and academic activity without having to wait for the school to send out reports only. This is largely aligned with the findings of Rohman et al. (2025) who pointed out that a school information system helped in delivering information to parents faster, as well as Amelia et al. (2023) who associated digital access with a higher level of parental involvement. The parents' relatively lower score (90%) on ease-of-use compared to teachers could be an indication that the groups have differences in digital fluency which a survey on parents' technology acceptance in the school context (Banic & Orehovacki, 2024) had highlighted.

Effectiveness

The five effectiveness dimensions were all judged to be effective. Academic information transparency was rated the best by teachers at 81.95%. Student discipline on the other hand was rated the same by both teachers and parents at 80.74%. The match in rating student discipline between teachers and parents deserves mention; it probably means that the two groups saw the same behavioral change or that one group did not simply paint the picture favorably of the system they were partially responsible for implementing. That parental trust in the school was rated as the lowest of the five effectiveness dimensions only 78.60% among teachers indicates that although DIJAGA seems mostly to support transparency and disciplines, building institutional trusts through transparent information access might be a process that takes a long time. This fits with Guo and Keles's (2024) finding that parent-school trust usually builds gradually rather than immediately with the introduction of a new communication channel.

Attendance improvement

Raising attendance levels from 87.22% to 92.05%, validated by a highly significant paired-samples t-test, $t(179)=6.975$, $p<0.05$, coupled with a moderate N-Gain (0.378) and a moderate effect size (Cohen's $d = 0.520$), makes it one of this study's main contributions. Many of the earlier studies on school mobile applications either only focus on usability or feasibility issues, while they don't test behavioral change statistically (Ancheta et al., 2021; Eliza et al., 2024). The results here show empirically and statistically that a change in mobile academic information system caused a notable positive change in a school-level indicator (attendance). The fact that absenteeism is a big contributor of poor academic results has been well accepted. Therefore, this outcome level evidence supports, besides only being a supplement, the perceived results (from surveys) on effectiveness of the system that were mentioned above. On the other hand, the fact that the N-Gain and effect size are only moderate (not large) implies that DIJAGA brought about a genuine improvement in terms of attendance without creating a radical change which is an expectation that could reasonably be made after a short development period and considering the wide range of non-technological factors that determine the number of students who attend classes.

Stakeholder integration

Distinguishing DIJAGA is that not only did the tool cater to the three roles, school management, parents, and teachers, that most digital school system solutions target, but it was also a system where students' attendance records served as one of the components that made the whole platform more effective. This was an important aspect of addressing the gap identified in the study, where digital school diaries (Jeremiah & Mtebe, 2018) that did not involve all participants through attendance outcomes or AROMAZA systems (Rohman et al., 2025) that mainly aimed at enhancing relations between teachers and parents by focusing on student attendance records, had each offered considerable advantages in a single type of relationship only.

Vocational education context

The significance of our results is especially strong in the SMK context. In schools where rules and order are paramount, discipline, timely attendance, and regularity of attendance are not just ways of managing school work; they also indicate that you are prepared to go to work! In SMK, having such transparent school-home communication system is probably a little more important factor than in ordinary high school as vocational

education is quite focused on developing good work habits. This means that parents' roles in reinforcing these aspects would be more critical in schools that work closely with employers. This interpretation is in line, to a certain extent, with the general observations that parental involvement is related to better disciplinary outcomes (Antony-Newman, 2024).

Theoretical implications

Teachers and parents gave the program high practical rating, which makes sense since they saw both the ease of using the product and its usefulness. Therefore, they adopted the technology. Davis's Technology Acceptance Model (DATM) says so. This work not only explains the findings of such studies but also, from these findings, provides further support for the DATM. As it is now extended beyond only one user or stakeholder group of users to two stakeholder groups of a parent-teacher duo, the mobile educational setting is used as a case in point. Besides this, these results expand upon Epstein's (2011) model, particularly the two modes of involvement, namely Communicating and Learning-at-Home, by demonstrating the potential of a single channel for both instantaneous parent-teacher communication and academic support at home through the sharing of relevant information. Also, the fact that student discipline improved due to monitoring through the parent-teacher web application is, generally speaking, aligned with the developmental view of adolescent self-regulation (Santrock, 2018) whereby external structure and collaborative monitoring from school and home support the development of responsibility and honesty.

Practical implications

For school administrators, mobile information systems that bring together attendance, communication, and journaling on the same platform reduce the complexity of the academic operations, therefore enabling school boards and leaders to run more open, transparent, accountable academic policies. Mobile workflow integration of agenda and attendance by teachers lowers paperwork tasks, helps real-time recording of classroom activities, and makes documentation more consistent. Parents who can get the school information updates directly from the data, such as attendance and academic activity, will be able to involve themselves more effectively and timely in their children's school without relying totally on the child's reporting. Transparent monitoring intended only as a means of reinforcing discipline, responsibility, and honesty rather than a solely punitive surveillance. Mobile systems that integrate journaling, attending to and communicating with parent as functions can help administrators, at least, in running open, honest, and more accountable academic policies without the overhead of maintaining multiple tools.

Conclusions

Researchers created and tested DIJAGA, a mobile-based academic information system that combines teacher agenda journaling, student attendance tracking, and parental monitoring features in a vocational education setting via the ADDIE development approach at a single vocational school. Needs analysis results demonstrated that traditional, one-way academic management was a major obstacle for the school to provide transparency of information to parents. Systematic development of product, in which expert opinion played a role to guide three product revisions was done via five ADDIE stages. DIJAGA was given medium validation score with expert-validation 0, 833 (media) and content 0, 816 besides receiving very practical ratings from teachers (95%) and parents (91%). Effectiveness scores were high in five effectiveness indicators (80, 41% total). There was an improvement in student attendance from 87, 22% to 92, 05%, $t(179) = 6, 975$, $p \leq 0.05$, $N\text{-gain} = 0, 378$, Cohen's $d = 0, 520$. In view of these findings, we may state that a mobile information system that is multi-stochastic in its use (i.e., one that caters simultaneously to teacher, student, and parent requirements) constitutes an effective and practical tool to enhance the level and transparency of information that is shared within the school community. Given the single-site, pre-experimental design without a control condition, and the exclusion of academic achievement as an outcome measure, these results are best interpreted as exploratory evidence of feasibility and behavioral-proxy effectiveness rather than a fully validated, generalizable claim of causal effectiveness. This study was limited in number of ways, mostly due to the fact that the research was based entirely upon the findings of one vocational school. Firstly, the study was done only at one vocational school which restricts the generalizability of the findings to other schools and colleges. Secondly, the participants included teachers and parents of Grades X and XI as grade XII students were busy with the final school and skill exams during the research period. Thirdly, effectiveness was measured in relation to attendance, discipline, transparency, and parental involvement only, academic success was not measured. Additionally, it is important to highlight that the app features evaluated were agenda journaling, attendance, and parent monitoring while other features such as grade records, assignments, and direct two-way messaging are secondary features of this app and hence not the major focus of the evaluators. The fifth problem is that the application implementation was done for a very short duration and hence the sustainability of attendance increase in the long-term was not studied at all. Another limitation is that a two-way communication feature was not available at the time the data

for assessment and practice was collected. Thus, the impact of that feature has not actually been tested by using empirical methods. Besides that, usability and acceptance was assessed by students as holders of accounts hence student-level usability remains untouched. This paper does not have any results of normality tests, subgroup or moderator analyses (e.g., by grade level or subject), and comparisons or control-group data because they were not made public in the original article and so cannot be shown here. Further investigations might expand this work by carrying out multi-school implementation based on larger and more representative samples; employing longitudinal designs that measure the maintenance of attendance and discipline effects; conducting or having control-group studies that identify the impact of the application separately from other school initiatives; making sure that dedicated usability testing is not only carried out but also includes students as their own account holders; gathering proof about how well a person learns with their results being achieved in a practical way; connecting the platform to students' grades and their assignment data; running an actual test of the bidirectional messaging feature; making learning analytics an active part of the use of absence and engagement data; finding out whether or not AI can support us in identifying students who are likely to miss many classes very early on, building on the descriptive attendance-monitoring foundation established here.

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