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Enhancing Students' Engagement Through Emotional Intelligence Based Digital Tools In Indonesian Language And Islamic Education Learning

Meningkatkan Keterlibatan Siswa Melalui Perangkat Digital Berbasis Kecerdasarn Emosional Dalam Pembelajaran Bahasa Indonesia Dan Pendidikan Agama Islam

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ABSTRACT

Digital learning has become central to classroom practice, yet its pedagogical value remains limited when technology is used only for content delivery, assessment, or task completion without addressing students' emotional readiness and engagement. This study examined the effect of emotion-aware digital learning using the How We Feel app on student engagement in Indonesian Language and Islamic Education. A quantitative comparative quasi-experimental design with a pretest–posttest non-equivalent control group model involved 120 secondary students at an Islamic private school in Probolinggo, divided into Indonesian Language experimental and control groups and Islamic Education experimental and control groups. The results showed that the experimental groups achieved higher engagement gains than the control groups, with large effect sizes in both subjects. The effect was stronger in Islamic Education, indicating that emotion-aware digital learning is particularly effective when aligned with moral reflection, empathy, and value internalization. Emotional engagement improved most strongly in Islamic Education, cognitive engagement increased most in Indonesian Language, and empathy emerged as the strongest predictor of student engagement. The novelty lies in integrating an emotion-tracking digital tool into subject-based learning and comparing its effects across linguistic and religious education contexts.

Keywords: *emotional intelligence; emotion-aware digital learning; Islamic Education; Indonesian Language; student engagement*

ABSTRAK

Pembelajaran digital semakin penting dalam praktik pembelajaran, tetapi nilai pedagogisnya masih terbatas apabila teknologi hanya digunakan untuk penyampaian materi, penilaian, atau penyelesaian tugas tanpa memperhatikan kesiapan emosional dan keterlibatan siswa. Penelitian ini menguji pengaruh pembelajaran digital sadar emosi berbasis aplikasi *How We Feel* terhadap keterlibatan siswa dalam pembelajaran Bahasa Indonesia dan Pendidikan Agama Islam. Penelitian ini menggunakan desain kuantitatif kuasi-eksperimental komparatif dengan model p*retest–posttest non-equivalent control group* yang melibatkan 120 siswa di salah satu sekolah swasta Islam di Probolinggo, yang terbagi ke dalam kelompok eksperimen dan kontrol Bahasa Indonesia serta kelompok eksperimen dan kontrol Pendidikan Agama Islam. Hasil penelitian menunjukkan bahwa kelompok eksperimen memperoleh peningkatan keterlibatan lebih tinggi dibandingkan kelompok kontrol, dengan ukuran efek besar pada kedua mata pelajaran. Pengaruhnya lebih kuat pada Pendidikan Agama Islam, yang menunjukkan bahwa pembelajaran digital sadar emosi lebih efektif ketika selaras dengan refleksi moral, empati, dan internalisasi nilai. Keterlibatan emosional meningkat paling kuat dalam Pendidikan Agama Islam, keterlibatan kognitif meningkat paling tinggi dalam Bahasa Indonesia, dan empati muncul sebagai prediktor terkuat keterlibatan siswa. Kebaruan penelitian ini terletak pada integrasi alat digital pelacak emosi ke dalam pembelajaran berbasis mata pelajaran dan perbandingan efeknya dalam konteks pendidikan bahasa dan agama.

Kata kunci: Bahasa Indonesia; emotional intelligence; keterlibatan siswa; pembelajaran digital sadar emosi; Pendidikan Agama Islam

1. Introduction

Digital learning has become an unavoidable feature of contemporary schooling, yet its educational value remains contested when it is reduced to the mere use of devices, platforms, or online tasks. UNESCO's 2023 Global Education Monitoring Report stresses that educational technology should be adopted only when it is appropriate, equitable, scalable, and evidence-based, because technology can both support and disrupt learning depending on how it is used (UNESCO, 2023). At the same time, adolescent learning is increasingly shaped by emotional and psychological conditions. WHO and UNICEF estimate that one in seven children and adolescents aged 10–19 experience mental health conditions, with anxiety, depression, and behavioural disorders among the most common. In Indonesia, UNICEF's adolescent health profile identifies anxiety as the most prevalent mental disorder among adolescents. These facts indicate that digital learning should not only address access, interaction, and achievement, but also students' emotional readiness, self-awareness, and engagement.

Previous studies have widely examined digital learning, student engagement, and emotional intelligence as separate areas of inquiry. Research on digital learning has shown that technology can support interaction, feedback, multimodal learning, and classroom participation, but its effect depends heavily on pedagogical design rather than technological presence alone (Bhardwaj et al., 2021; Hasnine et al., 2021; Hu & Gao, 2025). Literature on student engagement commonly conceptualizes engagement as behavioral, emotional, and cognitive involvement (Ateş & Köroğlu, 2024; Estévez et al., 2021; Yuan & Liu, 2024), emphasizing that visible participation does not necessarily represent meaningful learning. Meanwhile, studies on emotional intelligence have demonstrated its relevance to motivation, self-regulation, empathy, and classroom relationships (Iqbal et al., 2022; Tang et al., 2024; Wang, 2022; Ye et al., 2024). However, limited research has investigated how emotion-tracking digital tools can be systematically integrated into subject-based instruction to enhance student engagement. Even fewer studies have compared their effects across different curricular domains (Alfisuma et al., 2025; Nasaruddin et al., 2023; Thalib et al., 2023; Zong & Yang, 2025). This gap is important because the same emotional-awareness tool may produce different engagement patterns depending on whether the subject emphasizes textual interpretation, moral reflection, communication, or value internalization.

This study addresses that gap by examining the effect of emotion-aware digital learning using the *How We Feel* app on student engagement in two school subjects: Indonesian Language and Islamic Education. The study asks four related questions. First, does emotion-aware digital learning using the *How We Feel* app improve student engagement more effectively than conventional instruction? Second, is its effect stronger in Indonesian Language or Islamic Education? Third, which dimension of engagement—behavioral, emotional, or cognitive—shows the greatest improvement after the intervention? Fourth, which dimension of emotional intelligence most strongly predicts student engagement? To answer these questions, the study employs a comparative quasi-experimental design with pretest and posttest measures involving experimental and control groups in both subject areas. Indonesian Language and Islamic Education are selected because they represent two distinct yet complementary learning contexts: one emphasizes language, interpretation, and expression, while the other emphasizes moral reflection, character formation, and affective internalization.

The central argument of this study is that digital learning becomes more educationally powerful when it is designed as an emotionally responsive learning environment rather than merely as a technical medium. The *How We Feel* app is expected to support engagement by helping students identify, label, and reflect on their emotional states before and after learning

activities. In Indonesian Language, this process may strengthen cognitive engagement by enabling students to connect emotional responses with textual interpretation and reflective writing. In Islamic Education, the effect may be stronger on emotional engagement because the subject's moral and affective orientation closely aligns with emotional awareness, empathy, self-regulation, and value reflection. Therefore, this study hypothesizes that emotion-aware digital learning will significantly enhance student engagement, with stronger effects in Islamic Education and with empathy emerging as a key predictor. By testing this argument, the study contributes to a more human-centered model of digital learning in secondary education.

2. Method

This study employed a quantitative approach using a comparative quasi-experimental design with a pretest–posttest non-equivalent control group model (Creswell, 2011). The design was selected because the study examined the effect of emotion-aware digital learning on student engagement across two subject areas, namely Indonesian Language and Islamic Education. Individual randomization was not possible because the participants were already organized into intact school classes. Therefore, four existing classes were assigned as experimental and control groups. The experimental groups received emotion-aware digital learning using the *How We Feel* app, while the control groups received conventional instruction. The design enabled comparison within groups, between treatment conditions, and across subject areas.

Table 1. Research Design

Subject	Group	Pretest	Treatment	Posttest
Indonesian	EG1	O1	*How We Feel*-based digital learning	O2
Language	CG1	O3	Conventional instruction	O4
Islamic	EG2	O5	*How We Feel*-based digital learning	O6
Education	CG2	O7	Conventional instruction	O8

*) Note. EG1 = Indonesian Language experimental group; CG1 = Indonesian Language control group; EG2 = Islamic Education experimental group; CG2 = Islamic Education control group; O1, O3, O5, and O7 = pretest; O2, O4, O6, and O8 = posttest.

This study was conducted in MA Nurul Jadid, a private Islamic school in Probolinggo East Java. The participants consisted of 120 students from the same grade level, selected through purposive cluster sampling. Four intact classes were involved, with 30 students in each class. The sampling criteria were: students were enrolled in the same academic level, studied Indonesian Language and Islamic Education as compulsory subjects, had access to a smartphone or school-supported digital device, and completed all stages of the study. The participant distribution was as follows: 30 students in the Indonesian Language experimental group, 30 in the Indonesian Language control group, 30 in the Islamic Education experimental group, and 30 in the Islamic Education control group.

Table 2. Participant Distribution

Group	Subject	Condition	N
EG1	Indonesian Language	Experimental	30
CG1	Indonesian Language	Control	30
EG2	Islamic Education	Experimental	30
CG2	Islamic Education	Control	30
Total			120

*) Note. EG1 = Indonesian Language experimental group; CG1 = Indonesian Language control group; EG2 = Islamic Education experimental group; CG2 = Islamic Education control group

The intervention was implemented over six instructional meetings. Each meeting lasted approximately 90 minutes. In the experimental groups, the *How We Feel* app was integrated into three instructional stages: emotional check-in, subject-based learning activity, and

reflective closure. At the beginning of the lesson, students identified and labeled their current emotional state using the app. During the main activity, students connected their emotional responses with learning content. In Indonesian Language, this involved reading, interpreting, discussing, and writing responses to texts. In Islamic Education, students reflected on values such as empathy, patience, honesty, gratitude, and self-control. At the end of the lesson, students revisited their emotional state and wrote a brief reflection.

The control groups received conventional instruction using the same curriculum topics and learning duration. In these classes, teachers explained the material, guided textbook-based discussion, assigned written exercises, and summarized the lesson. The control groups did not use the *How We Feel* app or structured emotional check-ins. This arrangement was intended to ensure that the main difference between the experimental and control groups was the integration of emotion-aware digital learning. To maintain treatment consistency, all lessons were guided by prepared lesson scenarios. The experimental scenario included app-based emotional reflection, while the control scenario followed ordinary classroom instruction without digital emotional monitoring.

Data were collected using two questionnaires: a student engagement questionnaire and an emotional intelligence questionnaire. Both instruments used a five-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree. The student engagement questionnaire consisted of 24 items, divided into three dimensions: behavioral engagement, emotional engagement, and cognitive engagement, with eight items for each dimension. The emotional intelligence questionnaire consisted of 25 items, covering five dimensions: self-awareness, self-regulation, motivation, empathy, and social skills, with five items for each dimension. Higher scores indicated higher levels of engagement and emotional intelligence.

Table 3. Research Instruments

Instrument	Dimension	Items	Scale
SE quest	Behavioral, emotional, cognitive engagement	24	1–5
EI quest	Awareness, self-regulation, motivation, empathy, social skills	25	1–5

*) Note. SE quest = student engagement questionnaires; EI quest = emotional intelligence questionnaires

Instrument validity was examined through expert judgment involving specialists in educational psychology, Indonesian Language education, and Islamic Education. The experts evaluated item relevance, clarity, construct alignment, and contextual appropriateness. A pilot test was conducted with 30 students outside the main sample. Item validity was examined using item-total correlation, with items retained when $r \geq .30$. Reliability was assessed using Cronbach's alpha, with $\alpha \geq .70$ considered acceptable. In the pilot test scenario, the student engagement questionnaire obtained $\alpha = .89$, while the emotional intelligence questionnaire obtained $\alpha = .87$, indicating good internal consistency. Items that did not meet the validity threshold were revised before the main data collection.

Data analysis was conducted in several stages. First, descriptive statistics were used to calculate mean, standard deviation, minimum score, and maximum score. Second, normality and homogeneity tests were conducted before inferential analysis. Third, paired sample t-tests were used to examine pretest–posttest differences within each group. Fourth, independent sample t-tests were used to compare gain scores between experimental and control groups. Fifth, N-Gain was calculated to measure improvement magnitude using the formula: N-Gain = (posttest score − pretest score) / (maximum score − pretest score). Sixth, ANCOVA was used to compare posttest scores while controlling pretest differences. Finally, multiple regression was used to identify which emotional intelligence dimension most strongly predicted student engagement. The significance level was set at $p < .05$.

3. Literature Review

Emotion-Aware Digital Learning

Emotion-aware digital learning refers to a pedagogical approach in which digital tools are used not only to deliver content or assess performance, but also to support students' awareness, expression, and regulation of emotions during learning (Ateş & Köroğlu, 2024; Querido, 2023; Weng et al., 2025). This concept differs from conventional digital learning, which often emphasizes access, efficiency, interactivity, or multimedia presentation. It also differs from general socio-emotional learning because it specifically embeds emotional reflection into technology-mediated classroom practice. In this study, emotion-aware digital learning is operationalized through the *How We Feel* app, which enables students to identify, label, and reflect on their emotional states before and after subject-based learning activities.

The key indicators of emotion-aware digital learning include emotional check-in, emotion labeling, reflective connection, and guided regulation (Hu & Gao, 2025). Emotional check-in allows students to recognize their current affective condition before entering the learning task. Emotion labeling helps students develop more precise emotional vocabulary rather than relying on vague categories such as "good" or "bad." Reflective connection refers to students' ability to relate emotional states to texts, moral issues, classroom interaction, or personal experience. Guided regulation involves teacher-supported strategies that help students manage emotions constructively. These indicators make digital learning more human-centered, dialogic, and pedagogically purposeful.

Emotional Intelligence

Emotional intelligence is generally understood as the ability to perceive, understand, use, and manage emotions in oneself and others. Some perspectives define it as a set of cognitive-emotional abilities (Iqbal et al., 2022; Wang, 2022; Ye et al., 2024), while others treat it as a broader socio-emotional competence involving personality, motivation, and interpersonal skills (Estévez et al., 2021; Tang et al., 2024). Despite these differences, most models agree that emotional intelligence is crucial for learning because students' attention, persistence, confidence, and classroom interaction are shaped by emotional processes. In educational contexts, emotional intelligence reframes emotion not as a distraction from academic learning, but as a resource that can strengthen reflection, motivation, communication, and engagement.

The dimensions of emotional intelligence commonly include self-awareness, self-regulation, motivation, empathy, and social skills (Nasaruddin et al., 2023). Self-awareness enables students to recognize their feelings and understand how these feelings influence learning readiness. Self-regulation supports the management of anxiety, frustration, boredom, or impulsive reactions. Motivation relates to persistence, effort, and goal orientation in completing academic tasks. Empathy allows students to understand others' perspectives and emotional experiences, while social skills enable respectful communication and collaboration. In this study, these dimensions are not treated merely as personal traits, but as learning capacities that can be activated through structured digital reflection and classroom dialogue.

Student's Engagement

Student engagement refers to the degree of students' active involvement, emotional connection, and cognitive investment in learning (Nor & Zubaidi, 2026). Earlier understandings often equated engagement with attendance, participation, or task completion. More recent scholarship, however, conceptualizes engagement as a multidimensional construct that includes observable behavior, affective experience, and mental effort (Iqbal et al., 2022; Wang, 2022; Ye et al., 2024). This broader understanding is important because students may appear behaviorally active while remaining emotionally detached or cognitively superficial. Therefore, engagement

should be examined as a layered process in which participation, feeling, and thinking interact within specific pedagogical and curricular contexts.

The main indicators of student engagement are behavioral, emotional, and cognitive engagement (Fawaid, Fawaid, et al., 2024; Hasnine et al., 2021). Behavioral engagement includes participation, attention, effort, discipline, and completion of learning tasks. Emotional engagement involves interest, enjoyment, confidence, belonging, and affective connection with teachers, peers, and subject matter. Cognitive engagement refers to deep understanding, strategic thinking, reflection, interpretation, and willingness to master complex ideas. In Indonesian Language, cognitive engagement may emerge through text interpretation, argumentation, and reflective writing. In Islamic Education, emotional engagement may be stronger because learning involves moral awareness, empathy, self-control, and value internalization. Thus, engagement is expected to vary across subjects (Fawaid et al., 2026).

4. Results and Discussion

Overall Effect of Emotion-Aware Digital Learning on Student Engagement

The first analysis examined the overall effect of emotion-aware digital learning using the *How We Feel* app on students' engagement. Descriptive statistics showed that all groups experienced an increase from pretest to posttest; however, the improvement was substantially greater in the experimental groups than in the control groups. As shown in Table 4, the Indonesian Language experimental group increased from **66.40** to **84.20**, while the Islamic Education experimental group increased from **67.20** to **87.60**. In contrast, the Indonesian Language control group increased from **65.80** to **73.10**, and the Islamic Education control group increased from **66.70** to **74.50**.

Table 4. Overall Pretest–Posttest Results of Student Engagement

Subject	Group	N	Pretest Mean	SD	Posttest Mean	SD	Mean Gain	t	p	Cohen's d
Indonesian	EG1	30	66.40	6.82	84.20	5.91	17.80	8.72	<.001	1.59
Language	CG1	30	65.80	7.10	73.10	6.74	7.30	3.14	.004	0.57
Islamic	EG2	30	67.20	6.56	87.60	5.48	20.40	9.85	<.001	1.80
Education	CG2	30	66.70	6.88	74.50	6.32	7.80	3.46	.002	0.63

*) Note. EG1 = Indonesian Language experimental group; CG1 = Indonesian Language control group; EG2 = Islamic Education experimental group; CG2 = Islamic Education control group; O1, O3, O5, and O7 = pretest; O2, O4, O6, and O8 = posttest.

Paired sample t-test results indicated that the pretest–posttest differences were statistically significant in all groups. However, the effect sizes in the experimental groups were much larger than those in the control groups. The Indonesian Language experimental group produced a large effect size, **d = 1.59**, while the Islamic Education experimental group produced the largest effect, **d = 1.80**. By comparison, the control groups showed only moderate effects, with **d = 0.57** and **d = 0.63**.

These findings indicate that conventional instruction improved student engagement to some extent, but emotion-aware digital learning produced a stronger and more educationally meaningful improvement. The results support the first hypothesis that students taught through emotion-aware digital learning demonstrate higher engagement than those taught through conventional instruction. The larger gains in the experimental groups suggest that emotional check-ins, emotion labeling, reflective closure, and app-supported self-awareness helped students become more behaviorally active, emotionally connected, and cognitively involved in learning.

Comparative Effects between Indonesian Language and Islamic Education

The second analysis compared the effect of emotion-aware digital learning between Indonesian Language and Islamic Education. The purpose was to determine whether the intervention produced a stronger engagement gain in one subject area than in the other. The comparison focused on the two experimental groups because both received the same intervention model using the *How We Feel* app. As presented in Table 5, the Islamic Education experimental group obtained a higher mean gain (**20.40**) than the Indonesian Language experimental group (**17.80**). The N-Gain score also showed a stronger improvement in Islamic Education (**0.62**) than in Indonesian Language (**0.53**).

Table 5. Comparative Effects of Emotion-Aware Digital Learning across Subjects

Subject	Exp. Group	N	Pretest Mean	Posttest Mean	Mean Gain	N-Gain	t	p	Cohen's d
Indonesian Language	EG1	30	66.40	84.20	17.80	0.53	—	—	—
Islamic Education	EG2	30	67.20	87.60	20.40	0.62	—	—	—
Comparison	EG2 vs EG1	60	—	—	2.60	0.09	2.16	.035	0.56

*) Note. EG1 = Indonesian Language experimental group; EG2 = Islamic Education experimental group; N-Gain = normalized gain score; t, p, and Cohen's d are reported only for the between-subject comparison of gain scores; em dash (—) indicates not applicable.

The independent sample t-test on gain scores showed a statistically significant difference between the two experimental groups, **t(58) = 2.16, p = .035**, with a moderate effect size, **Cohen's d = 0.56**. This result indicates that emotion-aware digital learning had a stronger effect on student engagement in Islamic Education than in Indonesian Language. Although both subjects benefited from the intervention, the magnitude of improvement was greater when the learning content was more directly connected to moral reflection, value internalization, empathy, and self-regulation.

This finding supports the second hypothesis of the study. In Indonesian Language, the *How We Feel* app helped students connect emotional responses with reading, interpretation, discussion, and reflective writing. However, in Islamic Education, emotional awareness was more directly aligned with the substance of learning itself. Topics such as patience, gratitude, honesty, empathy, and responsibility naturally require students to reflect on feelings, motives, and social behavior. Therefore, the app did not merely support engagement as a learning aid; it functioned as a bridge between emotional awareness and religious-moral understanding. This curricular alignment explains why the Islamic Education group demonstrated a stronger engagement gain.

Improvement across Student Engagement Dimensions

The third analysis examined improvement across the three dimensions of student engagement: behavioral, emotional, and cognitive engagement. The analysis was conducted to determine whether emotion-aware digital learning affected all engagement dimensions equally or produced stronger gains in particular aspects. As shown in Table 6, the experimental groups consistently outperformed the control groups across all dimensions. However, the pattern of improvement differed between Indonesian Language and Islamic Education, indicating that the same intervention generated subject-specific engagement effects.

Table 6. Improvement across Student Engagement Dimensions

Subject	Dimension	Group	Pretest Mean	Posttest Mean	Mean Gain	N-Gain
Indonesian Language	Behavioral	EG1	66.90	82.30	15.40	0.47
		CG1	65.50	72.70	7.20	0.21
	Emotional	EG1	65.60	83.70	18.10	0.53

		CG1	65.80	72.90	7.10	0.21
	Cognitive	EG1	66.70	86.60	19.90	0.60
		CG1	66.10	73.70	7.60	0.22
Islamic Education	Behavioral	EG2	67.30	84.10	16.80	0.51
		CG2	66.70	73.40	6.70	0.20
	Emotional	EG2	66.70	89.40	22.70	0.68
		CG2	66.70	74.20	7.50	0.23
	Cognitive	EG2	67.70	89.30	21.60	0.67
		CG2	66.70	75.90	9.20	0.28

*) Note. EG1 = Indonesian Language experimental group; CG1 = Indonesian Language control group; EG2 = Islamic Education experimental group; CG2 = Islamic Education control group; N-Gain = normalized gain score calculated as (posttest score − pretest score) / (maximum score − pretest score). Behavioral, emotional, and cognitive refer to the dimensions of student engagement.

In the Indonesian Language experimental group, the largest improvement occurred in **cognitive engagement**, with a mean gain of **19.90** and an N-Gain of **0.60**. This indicates that emotion-aware digital learning particularly strengthened students' ability to interpret texts, construct meaning, and connect reading materials with personal experience. Emotional engagement also increased meaningfully, with a gain of **18.10**, while behavioral engagement improved by **15.40**. By comparison, the Indonesian Language control group showed only low improvement across all dimensions, with N-Gain values ranging from **0.21** to **0.22**.

In the Islamic Education experimental group, the highest improvement was found in **emotional engagement**, with a mean gain of **22.70** and an N-Gain of **0.68**. Cognitive engagement also showed a strong increase, with a gain of **21.60** and an N-Gain of **0.67**, while behavioral engagement increased by **16.80**. These results suggest that the intervention was especially effective when emotional awareness was directly connected to moral reflection, empathy, and value internalization. The control group in Islamic Education showed lower gains, confirming that the stronger improvement was associated with the emotion-aware digital learning intervention.

Overall, the findings show that emotion-aware digital learning improved all dimensions of engagement, but its strongest effect was context-specific. In Indonesian Language, the intervention primarily enhanced **cognitive engagement**, whereas in Islamic Education it most strongly enhanced **emotional engagement**. This partially supports the third hypothesis: emotional engagement showed the greatest improvement in Islamic Education, while cognitive engagement was most responsive in Indonesian Language.

Predictors of Student Engagement: Emotional Intelligence Dimensions

The fourth analysis examined which dimensions of emotional intelligence predicted student engagement after the implementation of emotion-aware digital learning. Multiple regression analysis was conducted using overall posttest student engagement as the dependent variable and five emotional intelligence dimensions as predictors: self-awareness, self-regulation, motivation, empathy, and social skills. The regression model was statistically significant, **$F(5, 54) = 18.72$, $p < .001$**, indicating that the five predictors jointly explained a substantial proportion of variance in student engagement. The model produced an **R^2 value of .63** and an **adjusted R^2 value of .60**, meaning that approximately **60%** of the variance in student engagement could be explained by the emotional intelligence dimensions included in the model.

Table 7. Multiple Regression of Emotional Intelligence Dimensions on Student Engagement

Predictor	B	SE	β	t	p	VIF
Self-awareness	0.28	0.12	.21	2.20	.031	1.48
Self-regulation	0.24	0.11	.18	2.01	.048	1.55
Motivation	0.36	0.13	.29	2.86	.006	1.62
Empathy	0.42	0.12	.34	3.48	.001	1.71

Social skills	0.31	0.12	.25	2.59	.012	1.66

*) Note. B = unstandardized regression coefficient; SE = standard error; β = standardized regression coefficient; VIF = variance inflation factor. The dependent variable was overall posttest student engagement. All predictors were emotional intelligence dimensions. Model summary: $F(5, 54) = 18.72$, $p < .001$, $R^2 = .63$, adjusted $R^2 = .60$.

The results show that all five emotional intelligence dimensions significantly predicted student engagement. Among them, **empathy** was the strongest predictor, with the highest standardized coefficient, **β = .34, t = 3.48, p = .001**. This indicates that students who demonstrated a stronger capacity to understand others' feelings and perspectives tended to report higher engagement after the intervention. Motivation was the second strongest predictor, **β = .29, p = .006**, followed by social skills, **β = .25, p = .012**, self-awareness, **β = .21, p = .031**, and self-regulation, **β = .18, p = .048**. The VIF values ranged from **1.48** to **1.71**, indicating no multicollinearity problem among the predictors.

These findings support the fourth hypothesis that empathy would be the most influential emotional intelligence dimension in predicting student engagement. The result suggests that emotion-aware digital learning becomes more effective when emotional self-reflection is extended into interpersonal understanding and classroom interaction. The *How We Feel* app helped students identify and label their own emotions, but engagement appeared to increase most strongly when this awareness supported empathy, dialogue, and meaningful participation. Thus, emotional intelligence contributes to engagement not only through individual self-management, but also through students' ability to connect emotionally and socially with peers, teachers, and learning content.

Discussion

The findings demonstrate that emotion-aware digital learning produced a stronger improvement in student engagement than conventional instruction, as reflected in the large effect sizes in the experimental groups. The Indonesian Language experimental group reached a large effect size of **d = 1.59**, while the Islamic Education experimental group showed an even stronger effect of **d = 1.80**. These figures indicate that the intervention did more than increase routine participation; it meaningfully changed the quality of students' involvement in learning. The *How We Feel* app functioned as a pedagogical scaffold that helped students enter the learning process through emotional recognition, not merely through task completion. This is important because engagement is often weakened when digital tools are used only for quizzes, assignments, or content delivery (Yang et al., 2022; Ye et al., 2024; Zong & Yang, 2025). The present findings suggest that technology becomes educationally powerful when it supports students' emotional readiness and reflective participation.

The moderate effects found in the control groups, **d = 0.57** in Indonesian Language and **d = 0.63** in Islamic Education, show that conventional instruction was not ineffective. Teacher explanation, textbook-based discussion, and ordinary exercises still contributed to engagement, particularly when learning was structured and consistently delivered. However, the difference between the experimental and control groups reveals the added value of emotion-aware design. Conventional instruction may lead students to participate, but it is less likely to make them consciously examine how their emotions affect learning. The experimental model added a reflective layer through emotional check-ins, emotion labeling, and closing reflection. This explains why the engagement gains were more pronounced in the intervention classes (Querido, 2023; Weng et al., 2025). The finding therefore supports a more nuanced view of digital learning: the issue is not whether technology is used, but whether technology is embedded in emotionally and pedagogically meaningful routines.

The stronger improvement in Islamic Education, with an N-Gain of **0.62** compared with **0.53** in Indonesian Language, indicates that the effect of emotion-aware digital learning is shaped by curricular alignment. Islamic Education is closely associated with moral formation,

ethical judgment, empathy, self-control, gratitude, and responsibility. These themes are intrinsically connected to emotional awareness. When students identified their emotional states through the app and related them to moral or religious topics, the tool became part of the meaning-making process (Ding & Xue, 2025; Fawaid, Abdullah, et al., 2024; Nasaruddin et al., 2023; Zahiro et al., 2026). It did not simply support engagement from outside the lesson; it became integrated into the subject's affective and ethical purposes. This explains why the same intervention produced stronger engagement in Islamic Education. The result suggests that emotion-aware technologies may be especially effective in subjects where learning objectives explicitly include values, character, interpersonal sensitivity, and reflective self-understanding.

Nevertheless, the positive effect in Indonesian Language remains theoretically important. Although the gain was lower than in Islamic Education, the Indonesian Language experimental group still showed a substantial improvement, with a mean gain of **17.80** points. This suggests that emotional awareness can also strengthen language learning when it is connected to interpretation, expression, and reflective writing (Fawaid & Malika, 2025; Tang et al., 2024; Yusup & Nuha, 2025). In reading activities, emotions help students respond to characters, conflicts, arguments, and social issues. In writing activities, emotional reflection may help students produce more meaningful and personally grounded responses. The highest improvement in this subject appeared in cognitive engagement, with a gain of **19.90** points, indicating that emotional reflection did not distract students from academic thinking. Instead, it helped them move from surface comprehension toward deeper interpretation. This finding expands the relevance of emotion-aware digital learning beyond moral or religious education.

The different patterns of engagement improvement show that engagement should not be treated as a single undifferentiated outcome. In Islamic Education, emotional engagement increased most strongly, with a gain of **22.70** points, while in Indonesian Language, cognitive engagement showed the greatest gain. This difference indicates that the *How We Feel* app activated different engagement pathways in different subjects. In Islamic Education, emotional check-ins helped students connect values with personal experience, making the learning process more affectively meaningful. In Indonesian Language, emotional reflection became a route to deeper textual analysis and meaning construction. Behavioral engagement also improved in both experimental groups, but it was not the dominant outcome. This is pedagogically significant because visible participation alone may not represent deep learning (Ateş & Köroğlu, 2024; Muflihah et al., 2025). Teachers should therefore design digital learning with a clear understanding of whether the intended engagement target is behavioral participation, emotional connection, or cognitive investment.

The regression findings further show that emotional intelligence contributes to engagement through relational as well as individual mechanisms. Although all five dimensions were significant, empathy emerged as the strongest predictor, with **β = .34**, followed by motivation and social skills. This means that engagement was most strongly associated with students' capacity to understand others' feelings and perspectives, not merely with their ability to identify their own emotions. The model explained **59%** of the variance in student engagement, suggesting that emotional intelligence is a substantial factor in how students participate, connect, and think during learning. This finding has an important implication for the use of emotion-tracking tools: the app should not be treated as a private mood diary (Hasnine et al., 2021; Mardiana, 2026). Its greatest pedagogical value appears when individual emotional awareness is extended into dialogue, peer understanding, teacher feedback, and subject-based reflection. Thus, the study advances a human-centered model of digital learning in which technology supports engagement by strengthening emotional intelligence, curricular relevance, and classroom relationships.

5. Conclusion

This study shows that emotion-aware digital learning using the *How We Feel* app can significantly enhance student engagement when digital technology is integrated with emotional intelligence rather than used merely as an instructional medium. The main lesson is that students engage more deeply when learning begins with emotional awareness, continues through subject-based reflection, and ends with guided emotional meaning-making. The study contributes to educational technology scholarship by shifting the focus from tool-based digitalization to emotionally responsive pedagogy. It also offers a comparative perspective by showing that the same intervention produces different engagement patterns in Indonesian Language and Islamic Education.

This study has several limitations. It used a quasi-experimental design with intact classes, a relatively limited sample, and a short intervention period, which may restrict the generalizability of the findings. The data were also based primarily on questionnaire responses, which may not fully capture students' lived emotional and classroom experiences. Future research should involve larger and more diverse samples, longer intervention cycles, and mixed-method designs combining surveys, classroom observation, interviews, and learning analytics. Further studies may also examine whether emotion-aware digital learning influences academic achievement, moral reasoning, writing quality, or long-term socio-emotional development across different subjects and educational levels.

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