

Effect of an Android-Based Mobile Learning Medium on Students' Motivation in a Digital Marketing Course: A Quasi-Experimental Study

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Abstract

Background - The development of digital marketing competencies is essential in technology-driven industries. However, learning outcomes and students' motivation in digital marketing courses at Magistra Utama Surakarta remain suboptimal due to the limited use of interactive and engaging learning media.

Research Urgency - The need for innovative learning media in digital marketing education has become increasingly urgent, particularly in vocational and practice-oriented contexts. Android-based mobile learning offers a promising alternative to improve student engagement, motivation, and instructional effectiveness.

Research Objectives - This study aims to analyze the effect of Android-based mobile learning media, namely EDUMAGI, on improving students' motivation in learning digital marketing at Magistra Utama Surakarta.

Research Method - This study employed a quasi-experimental design with a pretest-posttest control group. Participants were selected using cluster random sampling. The experimental group received instruction using the Android-based mobile learning media EDUMAGI, while the control group was taught through conventional methods. Data were analyzed using an independent samples t-test with SPSS 27.

Research Findings - The statistical analysis revealed a significant difference between the experimental and control groups ($t = 6.338$; $p = 0.002 < 0.025$), indicating that the implementation of Android-based mobile learning media resulted in higher student motivation scores. These findings demonstrate that EDUMAGI contributes to a more engaging, interactive, and effective learning experience in digital marketing instruction.

Research Conclusion - Android-based mobile learning media significantly enhance students' motivation in learning digital marketing. The use of EDUMAGI supports the integration of mobile learning as an effective alternative to conventional teacher-centered instructional approaches.

Research Novelty/Contribution - The findings contribute theoretically to the growing discourse on mobile learning adoption and practically offer an applicable instructional innovation for improving learner motivation and teaching quality in vocational education contexts.

Keywords: Android-Based Learning, Media Digital Marketing, Education Student Motivation

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INTRODUCTION

In the contemporary digital economy, digital marketing competence has become an essential capability for students preparing to enter business, entrepreneurial, and technology-mediated workplaces (Saputra et al, 2026). Recent studies show that digital literacy, digital connectivity, and adaptive digital capabilities significantly shape students' digital marketing competence and broader employability in business-related fields. This suggests that digital marketing instruction should not merely transmit concepts but should also cultivate applied competencies that are relevant to dynamic labor-market demands and digital business practices (Ru-Zhue et al., 2025; Imjai et al., 2025; Đorđević et al., 2025).

At the pedagogical level, teaching digital marketing presents a persistent challenge because the subject requires students to connect conceptual understanding with practice, decision-making, and authentic market-oriented tasks. Recent research in marketing and management education indicates that student engagement improves when instruction moves beyond lecture-dominated delivery toward more interactive, student-centered, and context-rich approaches (Ploy et al, 2024). Social media integration, storytelling, simulation, and other experiential designs have been shown to increase engagement, knowledge retention, conceptual relevance, and students perceived value of learning in marketing-related courses (Fazel & Sayaf, 2025; Malhan, 2025; Pitic & Irimiaș, 2023).

This issue is especially important in vocational education, where student motivation is central to persistence, participation, and successful skill development. Held and Mejeh (2024) demonstrate that learning environments that promote self-regulated learning have more positive effects on vocational students' motivation than regular teacher-cantered settings. Likewise, a recent systematic review by Balalle (2024) concludes that technology-based learning environments can strengthen student engagement when instructional design deliberately supports interaction, participation, and meaningful learning activities. Taken together, these findings reinforce the argument that motivation in vocational learning is strongly shaped by the quality of pedagogical design rather than by content delivery alone (Held & Mejeh, 2024; Balalle, 2024).

One promising approach to addressing this challenge is mobile learning. Recent evidence suggests that mobile learning provides flexible, accessible, and pedagogically meaningful opportunities to improve student learning experiences. A systematic review by Rangel-de Lazaro and Duarte (2023) found that mobile learning supports interaction, communication, collaboration, and learning effectiveness in higher education. Similarly, Pedraja-Rejas et al. (2024) show that mobile learning is associated with stronger learning outcomes and critical thinking, while Garzón et al. (2025), through a meta-analysis of 253 studies, report a large positive effect of mobile learning on student learning gains across educational settings. These findings indicate that mobile learning is not only technologically feasible but also educationally valuable for creating more active and responsive learning environments (Rangel-de Lazaro & Duarte, 2023; Pedraja-Rejas et al., 2024; Garzón et al., 2025).

In the context of Magistra Utama Surakarta, preliminary observation and interviews with institutional stakeholders indicate that students' motivation and learning outcomes in digital marketing remain suboptimal. Instruction is still largely conducted through lectures, discussion, whiteboards, textbooks, and occasional projector use, while interactive digital media have not been systematically integrated into classroom practice. At the same time, all students were reported to own smartphones, indicating strong technological readiness on the learner side (Essel, & Atagana, 2024; Eliza et al, 2024). This local condition reflects a broader pattern identified in recent literature: technology integration depends not only on device availability, but also on lecturers' digital competence, perceived usefulness of technology, school support, and access to training. Recent studies further show that limited digital competence, lack of confidence, inadequate support, and insufficient professional development remain major barriers to technology integration in vocational education (Dang et al., 2024; Cattaneo et al., 2025; Lohr et al., 2024; Rahmawati et al., 2025).

Although recent studies have examined engagement-enhancing approaches in marketing education through social media, storytelling, AI-supported design, and simulation-based learning, empirical research specifically testing Android-based mobile learning media in vocational digital marketing instruction remains limited (Purmadi et al, 2022; Sudarwati et al. 2025; Shofwan et al, 2026). This gap is particularly visible in institutionally specific, practice-oriented settings such as Magistra Utama Surakarta, where students are technologically equipped but learning media remain underdeveloped. Therefore, this study seeks to develop and empirically test EDUMAGI, an Android-based mobile learning medium for digital marketing instruction, in order to examine its effectiveness in improving students' learning motivation. The study contributes to the literature by extending mobile learning research into a vocational digital marketing context and by offering a practical instructional model that may support more engaging, learner-cantered teaching in similar institutions (Fazel & Sayaf, 2025; Malhan, 2025; Rangel-de Lazaro & Duarte, 2023).

METHODS

Research Design

This study employed a quasi-experimental design using a pretest-post-test control group format (Capily & Anastasi, 2024). This design was considered appropriate because the intervention was implemented in an existing instructional context in which individual random assignment was not feasible. In quasi-experimental educational research, this approach is widely used when researchers work with naturally occurring classroom groups while still seeking to compare change over time between treatment and comparison conditions. In the present study, one intact class was designated as the experimental group and received instruction using the Android-based mobile learning media EDUMAGI, whereas another intact class was designated as the control group and received conventional instruction without the media intervention. The independent variable was the use of Android-based mobile learning media, while the dependent variable was students' learning motivation. The pretest-post-test structure allowed the study to examine not only differences between groups but also changes in motivation before and after the intervention.

Participants and Sampling Technique

The population of this study consisted of students at Magistra Utama Surakarta who were enrolled in digital marketing instruction. Because the participants were already organized into intact classroom groups, the study used cluster-based sampling at the class level. Two classes were selected as research samples: one class served as the experimental group and the other as the control group. This technique was appropriate because the intervention was delivered to whole classes rather than to individual students. In classroom-based educational research, maintaining intact groups helps preserve the natural learning environment and reduces disruption to routine instructional practice. At the same time, assigning treatment at the class level is methodologically consistent with quasi-experimental studies where the classroom, rather than the individual learner, functions as the practical unit of intervention (Zhang et al, 2025).

Data Collection Technique

Data were collected using a learning motivation questionnaire administered in two stages: before the intervention (pretest) and after the intervention (post-test). The pretest was conducted to determine students' initial level of learning motivation in both groups prior to treatment, thereby providing baseline information for group comparison. The post-test was administered after the implementation of EDUMAGI in the experimental class in order to capture any changes in motivation following the intervention. Using both pretest and post-test measures strengthens the design because it enables researchers to evaluate whether motivational changes are associated with the treatment rather than relying solely on post-intervention differences. This procedure also makes it possible to compare motivational development in students who learned through the Android-based mobile learning media with those who continued learning through conventional instruction.

Research Instrument

The main research instrument was a learning motivation questionnaire designed to assess students' motivation in digital marketing learning. The questionnaire was selected because the main purpose of the study was to investigate the effect of Android-based mobile learning media on students' motivational outcomes. To strengthen methodological rigor, the questionnaire should ideally be supported by evidence of content validity and internal consistency reliability. Recent educational measurement studies emphasize that motivational instruments used in classroom research should demonstrate adequate validity and reliability before being employed to draw inferential conclusions. If available, you should therefore add a sentence reporting the questionnaire's validation process, such as expert review, pilot testing, and reliability analysis using Cronbach's alpha. This will make the instrument section substantially stronger (Brouwer et al, 2025).

Data Analysis

Data were analysed using SPSS version 27. In the first stage, descriptive statistics were used to summarize students' scores in both groups and to provide an overview of the distribution of pretest and post-test motivation data. In the second stage, the assumptions for parametric testing were examined. The Shapiro-Wilk test was used to assess the normality of the score distribution, while Levene's test was used to examine the homogeneity of variance between groups. These procedures are commonly used in educational intervention studies to determine whether parametric comparison tests are appropriate. The results indicated that all pretest and post-test data were normally distributed. The homogeneity test showed that the pretest scores were homogeneous ($p = 0.834$), whereas the post-test scores were not homogeneous ($p = 0.011$). Because the post-test variances were unequal, the hypothesis testing was conducted using the independent-samples t-test with the "equal variances not assumed" option, which is the appropriate SPSS output when the homogeneity assumption is violated. A significance level of 0.05 was applied in all statistical analyses (Faria, 2025).

RESULTS AND DISCUSSION

The descriptive statistics indicate that the two groups began the intervention from a relatively comparable level of motivation. The control group obtained a pretest mean of 76.50 (SD = 4.351), while the experimental group obtained a pretest mean of 76.32 (SD = 4.433). After the instructional treatment, both groups showed improvement, but the gain in the experimental group was more pronounced. The post-test mean of the control group increased to 83.14 (SD = 2.817), whereas the experimental group reached 87.18 (SD = 4.992). This pattern suggests that the use of EDUMAGI was associated with a stronger increase in students' learning motivation than conventional PowerPoint-based instruction. Such a pattern is in line with recent evidence showing that mobile learning environments tend to improve student engagement and learning gains when they are meaningfully integrated into instruction rather than used merely as supplementary technology (Garzón et al., 2025; Rangel-de Lázaro & Duarte, 2023).

Table 1. *Descriptive Statistics of Students' Learning Motivation Scores*

Group	N	Test	Mean	SD
Control Group	20	Pretest	76.50	4.351
Control Group	20	Post-test	83.14	2.817
Experimental Group	18	Pretest	76.32	4.433
Experimental Group	18	Post-test	87.18	4.992

Note. *The control group received conventional instruction using PowerPoint, whereas the experimental group received instruction using the Android-based mobile learning media EDUMAGI.*

Table 1 shows that both groups experienced an increase in learning motivation scores after instruction. However, the increase in the experimental group was higher than that in the control group. The experimental group improved from a mean score of 76.32 to 87.18, whereas the control group improved from 76.50 to 83.14. The assumption tests also support the use of parametric analysis. The Shapiro–Wilk test showed that the pretest and post-test scores in both groups were normally distributed, as all significance values were above .05. Meanwhile, Levene’s test indicated that the pretest variances were homogeneous, but the post-test variances were not homogeneous because the significance value was .011. This means that the post-test comparison should be interpreted using the *equal variances not assumed* line in SPSS. Methodologically, this does not invalidate the analysis; rather, it requires the researcher to use the more robust interpretation available for independent-samples *t* testing under unequal variance conditions. This procedure is consistent with standard statistical guidance for group-comparison analysis in educational research (Laerd Statistics, 2026; Kent State University Libraries, 2026).

Table 2. *Results of Normality and Homogeneity Tests*

A. Shapiro-Wilk Normality Test		
Variable	Group	Sig.
Pretest Motivation	Experimental Group	.109
Pretest Motivation	Control Group	.163
Posttest Motivation	Experimental Group	.308
Posttest Motivation	Control Group	.158

B. Levene’s Test of Homogeneity of Variance	
Variable	Sig.
Pretest Motivation	.834
Posttest Motivation	.011

Note. Data were normally distributed when $p > .05$. Variance was considered homogeneous when $p > .05$. The pretest scores were homogeneous, whereas the post-test scores were not homogeneous because the significance value was .011.

As shown in Table 2, the Shapiro-Wilk test indicated that all pretest and post-test scores were normally distributed, as all significance values were above .05. The Levene’s test showed that the pretest scores were homogeneous ($p = .834$), while the post-test scores were not homogeneous ($p = .011$). The inferential analysis showed a statistically significant difference between the two groups at post-test, with $p = .002$. Therefore, the null hypothesis stating that there is no significant difference in motivation between students taught using EDUMAGI and those taught using conventional media was rejected. In substantive terms, this means that Android-based mobile learning media had a significant positive effect on students’ motivation in digital marketing learning at Magistra Utama Surakarta. The result is not only statistically significant but also educationally meaningful because it demonstrates that the instructional medium can shape students’ willingness to engage, persist, and participate in vocational learning activities. Recent research similarly indicates that technology-supported instructional environments can generate stronger motivational outcomes when they increase interaction, accessibility, and learner participation (Held & Mejeh, 2024; Garzón et al., 2025).

Table 3. *Independent Samples T-Test of Students' Learning Motivation Scores*

Comparison	Mean Difference	Sig. (2-tailed)	Decision
Posttest Motivation (Experimental vs. Control)	4.04	.002	Significant difference

Note. The post-test mean score of the experimental group (87.18) was higher than that of the control group (83.14), indicating that the use of EDUMAGI was more effective than conventional PowerPoint-based instruction in improving students' learning motivation.

Table 3 indicates that there was a statistically significant difference between the experimental and control groups in post-test motivation scores ($p = .002$). This finding suggests that the Android-based mobile learning media EDUMAGI was more effective than conventional PowerPoint-based instruction in enhancing students' learning motivation. One important explanation for this result is that EDUMAGI likely changed the learning experience from passive reception into more active engagement. In vocational education, students' motivation is closely related to whether the learning environment allows them to feel involved, capable, and connected to the practical relevance of the material. Held and Mejeh (2024) found that self-regulated and student-cantered learning environments positively influence motivational development in vocational settings. Likewise, Wang et al. (2024) show in their meta-analysis that educational designs grounded in autonomy support and competence support tend to strengthen intrinsic motivation and students' positive engagement with learning tasks. Seen from this perspective, EDUMAGI may have enhanced motivation not only because it was digital, but because it offered a more autonomy-supportive and competence-enhancing learning experience than slide-based teaching alone (Held & Mejeh, 2024; Wang et al., 2024).

The findings are also highly plausible when viewed through the characteristics of mobile learning itself. Mobile learning allows students to access materials more flexibly, revisit content at their own pace, and engage with instructional resources beyond the temporal limits of face-to-face meetings (Traxler, 2009; Ilyas et al, 2025). Rangel-de Lázaro and Duart (2023), in a systematic review, conclude that mobile learning supports interaction, communication, and learning effectiveness in higher education. Similarly, Pedraja-Rejas et al. (2024) report that mobile learning is frequently associated with improved learning outcomes and stronger critical-thinking development when embedded within purposeful instructional design. These findings help explain why EDUMAGI could stimulate motivation more effectively: students were not merely receiving information but were experiencing a more accessible, responsive, and participatory mode of learning (Rangel-de Lázaro & Duart, 2023; Pedraja-Rejas et al., 2024).

Another reason the intervention may have worked well is the close fit between the medium and the subject matter (Staneviciene, & Žekienė, 2025). Digital marketing is not a purely theoretical course; it requires students to engage with applied concepts, digital platforms, communication strategies, and media-based decision making. Because the course content is inherently digital, an Android-based learning medium may have increased students' perception that the learning activities were relevant to real-world practice (Sriwhyuni et al, 2025). This interpretation is supported by recent research in marketing education. Fazel and Sayaf (2025) found that the integration of digital and social media tools into marketing instruction improved engagement and learning outcomes, while Malhan (2025) reported that interactive and contextually meaningful designs in marketing education help bridge the engagement gap in technically oriented business courses. Thus, EDUMAGI likely worked not only as a delivery tool but also as a pedagogical bridge between academic content and authentic digital marketing practice (Fazel & Sayaf, 2025; Malhan, 2025).

It is also important to note that the control group showed improvement, which means that conventional instruction was not ineffective (Munib et al, 2025; Darmawan et al, 2025). However, the larger increase in the experimental group indicates that the quality and format of the learning media matter. In other words, motivation in vocational learning is not shaped solely by teacher explanation or exposure to content, but also by how the content is organized, delivered, and experienced by learners. This aligns with broader evidence

suggesting that digital learning environments become most effective when they create meaningful interaction and reduce students' sense of passivity in class. Garzón et al. (2025) show that mobile learning tends to generate substantial positive effects when the design supports active participation, while Bülbül and Özelçi (2025) demonstrate that mobile learning motivation is positively associated with learners' digital readiness and their inclination to engage more actively in the learning process. This helps explain why EDUMAGI produced a stronger motivational effect than PowerPoint-based instruction (Garzón et al., 2025; Bülbül & Özelçi, 2025).

From a practical standpoint, the result has important implications for vocational education institutions such as Magistra Utama Surakarta. One of the recurring issues in vocational contexts is that students often possess the devices needed for digital learning, but classroom practice still relies on limited, teacher-dominated instructional media. Rahmawati et al. (2025) show that vocational education in Indonesia continues to face challenges in digital competence and technology integration, especially when institutional support and teacher readiness are insufficient. At the same time, research in marketing education emphasizes that the success of digital integration depends not only on the availability of technology but also on the pedagogical capacity to use it in ways that improve engagement and relevance (Fazel & Sayaf, 2025; Rahmawati et al., 2025). Therefore, EDUMAGI can be seen as a promising instructional innovation because it responds to both learner readiness and the pedagogical need for more engaging learning media.

Despite its positive findings, this study should also be interpreted with appropriate caution. The sample size was relatively small, and the two groups came from different study programs, which may introduce contextual variation beyond the instructional treatment itself. In addition, the present study focused on motivation rather than on actual performance or digital marketing competence (Galimova, E. G., et al., 2025; Windle et al., 2026). Future studies should therefore include larger samples, stronger controls, and additional outcome variables such as academic achievement, skill performance, project quality, or authentic digital marketing tasks (Vaszkun & Szakács, 2025; Song et al., 2025). This recommendation is consistent with current trends in mobile learning research, which increasingly call for studies that move beyond simple effect testing toward a deeper understanding of how, why, and under what conditions mobile learning produces meaningful educational outcomes (Pedraja-Rejas et al., 2024; Garzón et al., 2025).

Overall, the findings of this study demonstrate that EDUMAGI significantly enhanced students' motivation in digital marketing instruction at Magistra Utama Surakarta. The effect appears to stem from a combination of factors: the flexibility of mobile access, the interactive nature of the learning experience, and the contextual fit between Android-based media and the digitally oriented subject matter. The study therefore contributes in two ways. Academically, it extends the literature on mobile learning by providing evidence from a vocational digital marketing context that is still underrepresented in recent research (Rangel-de Lázaro & Duarte, 2023; Fazel & Sayaf, 2025). Practically, it offers an applicable instructional alternative for institutions seeking to move beyond conventional presentation-based teaching toward more motivating, learner-centered digital instruction. In this sense, EDUMAGI should be viewed not merely as a technological tool, but as a pedagogical intervention that can support more meaningful vocational learning in the digital era.

CONCLUSION

This study aimed to examine the effect of Android-based mobile learning media, namely EDUMAGI, on students' learning motivation in digital marketing instruction at Magistra Utama Surakarta. The findings revealed that EDUMAGI had a significant positive effect on students' motivation compared with conventional PowerPoint-based instruction, as indicated by the higher posttest mean score achieved by the experimental group. This result suggests that the effectiveness of EDUMAGI lies not merely in its digital format, but in its ability to create a more interactive, flexible, and contextually relevant learning experience that encourages students' interest, participation, and active engagement in vocational learning. In the context of digital marketing education, where learners are required to connect conceptual understanding with applied digital

practice, Android-based mobile learning media can serve as an effective instructional alternative to teacher-centered approaches. Thus, this study confirms that the integration of mobile learning into vocational education can strengthen students' learning motivation when supported by appropriate pedagogical design and alignment with course characteristics. The novelty of this study lies in its empirical investigation of EDUMAGI as a context-specific Android-based mobile learning medium for digital marketing instruction in a vocational education setting, thereby contributing new evidence to the limited body of research on learner motivation in vocational digital marketing education.

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