



Optimizing Craft Learning Experiences Through Mobile Learning Media Development with iSpring Suite: Solutions to Barriers to Student Understanding in Learning

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Abstract: Craft learning is an essential component of the education curriculum; however, students often encounter challenges in understanding and applying craft concepts effectively. This study aims to address these barriers by developing mobile learning media using iSpring Suite, leveraging its interactive features to enhance student engagement and comprehension. The research adopts the Instructional Development Institute (IDI) model, ensuring a structured approach to integrating instructional design, technology, and craft content. A quasi-experimental method was employed, involving pre-test and post-test assessments to measure learning improvements among students. The findings indicate that students who utilized the iSpring Suite-based mobile learning media demonstrated significantly higher comprehension and engagement levels than those using traditional lecture methods. A paired sample t-test ($p < 0.05$) with an N-gain analysis revealed a moderate improvement (0.50) and an effect size analysis (1.80), confirming a substantial impact on learning outcomes. These results suggest that mobile learning media can effectively bridge gaps in craft education by providing flexible access to materials and fostering interactive learning experiences. The study contributes to educational technology by highlighting the potential of mobile learning in vocational and skill-based education, offering insights for further research and implementation in diverse learning contexts.

Keywords: junior high school; learning media; m-learning; media development

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INTRODUCTION

Education is a crucial aspect of human potential formation and development. One of the primary challenges in education is ensuring the effectiveness of each student's learning. Numerous elements, including instructional strategies, learner participation, and the availability of educational resources, play a pivotal role in determining the effectiveness of the educational process. In the context of the digital age, the integration of information and communication technology (ICT) has significantly expanded opportunities within education, rendering the use of learning technologies indispensable (Cloete, 2017; Mahdum et al., 2019; Simamora, 2020). ICT facilitates access to a vast range of knowledge and enables interactive learning experiences.

On the other hand, educators need to face the challenge of ensuring that the learning methods used can reach students in a way that is appropriate to the times, not methods that are still conventional, tend to be static, and less interactive (Almazova et al., 2020; García-Morales et al., 2021; Rahiem, 2020). Consequently, the integration of innovative educational technologies is crucial for enhancing educational quality and effectively addressing prevailing challenges. Arts and crafts education represents a vital component of school curricula across many nations, as it fosters students' creative thinking, enhances their problem-solving capabilities, and supports the refinement of fine motor skills. However, some students may experience difficulties in understanding craft material due to its complex concepts, lack of practical skills, difficulty in visualizing creative ideas, lack of motivation, limited learning time in class, less than optimal student involvement, limited resources, and facilities in several schools for learning crafts (Rumapea, 2019; Simamora, 2020; Ulya et al., 2021). These challenges often lead to suboptimal learning outcomes and hinder students' ability to develop their artistic and craftsmanship potential. A suboptimal understanding can hinder students' development of the skills required in this field. Traditional craft teaching methods may not always be sufficient to address these challenges, necessitating the adoption of innovative instructional strategies. Therefore, innovation is needed in developing learning media that can increase the efficiency of craft learning, primarily through a mobile learning approach. Mobile learning provides a dynamic and adaptable environment that promotes greater student engagement and facilitates a deeper understanding of concepts related to craft education.

The pervasive presence of mobile devices—such as smartphones and tablets—in students' daily routines has supported the integration of mobile learning technologies within educational contexts. These tools provide ease of access and flexibility, enabling learners to engage with instructional content at any time and from any

location. This mode of learning became particularly essential during the COVID-19 pandemic, when mobility limitations and school closures necessitated alternative methods of instructional delivery. This shift in learning approaches has demonstrated the potential of mobile learning in providing continuity and flexibility in education. With gadgets such as smartphones or tablets, students can continue learning from home without losing contact with their curriculum (Azhari & Fajri, 2022; Churiyah et al., 2020; Rahayu et al., 2020). The utilization of educational applications, e-learning platforms, and digital resources supports the continuity of the teaching and learning process beyond the confines of the classroom. Mobile-based learning media, in particular, facilitate a more flexible and accessible learning experience, enabling students to engage with instructional content at any time and from anywhere. (Sihombing & Fatra, 2021; Sulisworo & Toifur, 2016). The incorporation of multimedia and interactive features within mobile learning environments has the potential to improve student motivation and active participation in craft education significantly.

The experience of the pandemic has demonstrated the essential function of technology and digital learning media in maintaining the continuity of education during emergencies or situations where in-person instruction is not feasible (Bahasoan et al., 2020; Dwikoranto et al., 2020; Susilawati & Supriyatno, 2020; Sutarto et al., 2020). The widespread adoption of digital learning tools by both students and educators has established their role as a fundamental component of contemporary education. The use of mobile-based learning media is expected to persist beyond the pandemic, reinforcing its relevance in post-pandemic educational practices. (Chibisa & Mutambara, 2022; Utamajaya et al., 2020). The effectiveness of mobile learning has encouraged educators and policymakers to consider its long-term implementation. Many schools and colleges have seen the benefits of the flexibility and affordability of mobile learning. The capacity of mobile learning to deliver personalized learning experiences and adaptive content underscores its value as an educational tool. Educational institutions are encouraged to further integrate mobile technologies into their instructional strategies as part of a comprehensive approach to contemporary education. By embracing digital innovations, educators can cultivate an engaging and effective learning environment that aligns with the evolving needs of today's learners.

The iSpring Suite learning media is a promising solution for developing mobile learning. It provides a user-friendly platform that enables educators to create engaging and interactive learning materials. iSpring Suite is a media application or add-on integrated with PowerPoint (Muis & Joenaidy, 2019; Nasution et al., 2023), providing a familiar experience to users. This integration allows teachers to develop e-learning content without requiring extensive technical expertise. iSpring Suite is a platform that enables the creation of e-learning content with various features, including simulations, interactive exams, and multimedia materials (Azzahrah et al., 2022; Dewi et al., 2021). These features enhance students' understanding and retention of craft-related concepts. By utilizing the iSpring Suite, learning can be presented in an interestingly way, allowing students to be actively involved in the learning process. The interactive nature of iSpring Suite fosters collaboration, creativity, and problem-solving skills among students, making it an effective learning tool.

Developing iSpring Suite media for mobile learning is typically carried out systematically. A structured development process ensures that learning materials align with educational objectives and meet the needs of students. These stages include analyzing learning needs, designing content that suits the characteristics of Craft subjects, developing content using iSpring Suite, testing and evaluation, and continuous improvement based on user feedback (Yani & Ratyaningrum, 2023). By following these steps, educators can create high-quality digital learning resources that enhance student engagement. Using iSpring Suite media will support a competency-based learning approach in craft subjects. This approach allows students to focus on developing practical skills relevant to their field. Meanwhile, the interactive exam and online evaluation features provided by iSpring Suite enable educators to objectively and effectively measure students' understanding and progress, allowing for adjustments and improvements in the learning process (Jatmiko & Safrida, 2022; Nur'aini et al., 2022). The integration of assessment tools helps educators track student learning outcomes and provide targeted support where needed.

In response to the identified challenges, the development of mobile learning media using iSpring Suite in the context of craft education aims to enhance students' learning effectiveness, promote greater engagement, and deepen their understanding of instructional content. This study introduces an innovative approach by integrating interactive and multimedia-based mobile learning tools tailored specifically for craft education, addressing existing challenges such as limited practical exposure, lack of motivation, and inadequate learning resources. The novelty of this research lies in its systematic application of iSpring Suite as a mobile learning platform that facilitates not only knowledge acquisition but also the enhancement of students' creativity and hands-on abilities within the realm of craft education. Moreover, this study offers a valuable contribution to the academic discourse by presenting empirical findings on the effectiveness of mobile learning technologies in advancing competency-based education, especially in vocational and creative disciplines. The findings are expected to serve as a reference for future research on technology-enhanced learning strategies and offer practical insights for educators and policymakers in optimizing digital learning media for craft education.

METHODS

This research utilizes the Instructional Development Institute (IDI) model as the foundational framework for developing mobile learning media through the iSpring Suite platform. The choice of the IDI model is grounded in its systematic methodology, which effectively integrates instructional design, technological tools, and educational content within a cohesive development process. The model comprises three core phases: define, develop, and evaluate. In the define phase, needs analysis, learner characteristics, learning objectives, and content structure are thoroughly identified. The development phase focuses on designing detailed instructional strategies, selecting appropriate multimedia formats, and producing learning content using iSpring Suite, ensuring it is interactive and aligned with student needs.

Meanwhile, the evaluation phase encompasses both formative and summative assessments to refine and validate the learning media, informed by user feedback and expert judgment. This model ensures that the learning media created are practical, interactive, and aligned with the specific needs of craft education. By applying this method, the research aims to optimize the use of iSpring Suite for enhancing student engagement, creativity, and understanding of craft concepts. The IDI model is particularly suitable for mobile learning development because it provides a step-by-step approach that enhances both usability and learning outcomes (Grabowski & Branch, 2003; Yuwana et al., 2023).

The research follows a structured process that allows continuous refinement based on empirical findings and user feedback. In particular, the content design and development stages involve careful selection and sequencing of instructional materials, ensuring that every module aligns with Bloom's Taxonomy and accommodates diverse learning styles. Multimedia resources, animations, and simulations were systematically created and tested using iSpring Suite to promote interactivity and deeper learning. To ensure accessibility and ease of navigation, user interface design principles were strictly applied throughout the development process. During formative evaluation, feedback from subject matter experts, students, and instructional designers was integrated iteratively to enhance the quality of the product. This systematic approach ensures that the final product is both effective and user-friendly, as well as pedagogically sound. Through this thorough methodology, the study enhances the credibility and replicability of the mobile learning media, providing a strong foundation for broader application in similar educational settings.

This study primarily seeks to design and assess mobile learning media utilizing iSpring Suite as a means to address challenges encountered in craft education. The research specifically focuses on identifying the obstacles students face in the learning process, developing an interactive mobile-based learning tool, and evaluating its effectiveness through empirical analysis. The research sample consists of Grade 8 students from SMP 4 Abung Barat, who were intentionally selected due to their active participation in the Crafts subject and the school's openness to adopting digital learning innovations. The limitation to only one school and one class was deliberately made to maintain focused control over the variables and ensure detailed monitoring during the intervention. Furthermore, selecting a representative middle school in a typical rural area allows the findings to be generalized cautiously to similar educational environments that face comparable challenges in craft education and the implementation of mobile learning. This strategic limitation ensures high internal validity while still offering meaningful implications for broader educational practices.

This study utilized a mixed-methods approach for data collection, combining quantitative and qualitative instruments to achieve a comprehensive and in-depth understanding of the research phenomena. The quantitative aspect was conducted using a one-group pre-test–post-test design, as illustrated in Table 1, which measured students' learning performance before and after using the developed iSpring Suite-based media. The instrument consisted of multiple-choice questions that were validated through item analysis. Validity testing was conducted by correlating item scores with total scores; items with $R_{count} > R_{table}$ were retained, while invalid items were removed. For reliability testing, Cronbach's Alpha was used. The qualitative component included structured interviews, participant observation, and student questionnaires to explore students' engagement, satisfaction, and perceived benefits. This combination of methods ensured a rich dataset that captured both measurable learning outcomes and subjective experiences.

Data analysis in this study integrates both descriptive and inferential statistical methods to assess the effectiveness of the developed learning media. Descriptive statistics are utilized to summarize central tendency measures and distribution patterns of the pre-test and post-test scores, whereas inferential analysis—specifically the paired sample t-test—is employed to determine the statistical significance of the differences observed between the two sets of data. This allows the research to rigorously test the hypothesis that the use of iSpring Suite mobile learning media improves student learning outcomes. Additionally, qualitative data from interviews, observations, and open-ended questionnaire responses are analyzed using thematic analysis, which involves coding and categorizing data into key themes related to engagement, usability, content relevance, and perceived effectiveness. The findings are interpreted in light of existing literature on mobile learning, instructional technology, and craft education. Through this multi-faceted analysis, the study aims to provide robust empirical evidence on the effectiveness of iSpring Suite as a mobile learning tool. The final results will contribute to the

body of knowledge in educational technology, offering practical recommendations for future research and implementation of mobile learning in creative and vocational education.

RESULT AND DISCUSSION

The development of learning media using the IDI (Instructional Development Institute) model follows three essential phases: define, development, and evaluation. These steps ensure that the learning media is structured effectively to meet educational goals and enhance student learning experiences. During the define phase, the focus was placed on formulating learning objectives, examining learner characteristics, and analyzing the instructional context. The participants in this study were eighth-grade students, aged between 13 and 14 years, a developmental stage marked by the emerging ability to comprehend complex ideas and integrate new information with existing knowledge. In the Crafts subject, students learn about the design and production process of soft material crafts, including generating ideas, creating sketches, and using design software. However, observations revealed that students exhibited low motivation due to traditional lecture-based teaching methods, which often led to disengagement. Additionally, while school infrastructure was limited, most students had access to smartphones and the internet, making mobile learning a viable solution.

The development phase transformed the instructional design into an interactive mobile learning medium using iSpring Suite. Content development included creating scripts, images, animations, and interactive features tailored to the craft learning process. The media underwent validation by both media design experts and subject matter experts, ensuring alignment with educational objectives. The validation outcomes indicated that the learning media fulfilled the required standards in terms of content, design, and usability, and were deemed appropriate for practical implementation. Once validated, the learning media were introduced to the students in a classroom setting. The practicality test, which involved teacher and student feedback, showed a "Very Practical" rating in terms of technical usability, content relevance, and design attractiveness. This confirmed that the developed media was user-friendly, engaging, and beneficial for learning.

The evaluation phase assessed the effectiveness of the mobile learning media through pre-test and post-test scores. Figure 1 and Table 2 present the pre-test and post-test results, showing that before using the mobile learning media, students scored an average of 59.14, with a highest score of 83 and a lowest score of 20. The mode (most frequent score) was 70.00, indicating that most students had moderate initial understanding of the material. After using the mobile learning media, post-test results revealed a significant improvement, with an average score of 80.91, a highest score of 98, and a lowest score of 55. The mode shifted to 83.00, demonstrating that most students achieved higher comprehension after the intervention. The N-gain score analysis was conducted to measure the learning improvement, yielding a score of 0.50, which falls in the medium category (Table 3). This suggests that the mobile learning intervention resulted in a substantial improvement in student understanding.

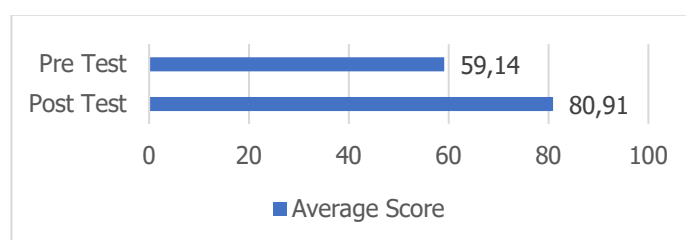


Figure 1. Comparison of Pre-Test and Post-Test Scores

Table 1. Results of Statistical Calculation of Pre-test and Post-test Scores

Pre-test			Posttest		
N	Valid	22	N	Valid	22
	Missing	0		Missing	0
	Mean	59.14		Mean	80.91
	Median	60.00		Median	82.00
	Mode	70		Mode	83
	Std. Deviation	14.838		Std. Deviation	8.476
	Variance	220.171		Variance	71.848
	Minimum	20		Minimum	55
	Maximum	83		Maximum	98
	Sum	2543		Sum	3479

To further validate the effectiveness of the mobile learning media, an effect size analysis was conducted.

The effect size measures the magnitude of learning improvement and is calculated using the formula $d = (\text{post-test mean} - \text{pre-test mean}) / \text{standard deviation}$. After performing the calculations, the effect size was found to be 1.80, which falls into the "large effect" category (Table 4). This suggests that the intervention had a strong positive impact on student learning outcomes. The larger the effect size, the more significant the difference in performance before and after using the learning media. Furthermore, a paired sample t-test was conducted to determine the statistical significance of the improvement between pre-test and post-test scores. The result showed that the value of $t = -7.845$ with degrees of freedom (df) = 21 and a significance value (Sig. 2-tailed) = 0.000. Since the p-value is less than 0.05, it can be concluded that there is a statistically significant difference between pre-test and post-test scores. The results affirm that mobile learning media designed using iSpring Suite serve as an effective instrument in enhancing students' understanding and active participation in craft education. The results highlight the importance of interactive and multimedia-enhanced learning tools in addressing educational challenges and enhancing student motivation and learning experiences.

Table 2. N-Gain Score Category

N-Gain Score	Category
$g > 0,70$	High
$0,30 \leq g \leq 0,69$	Medium
$g < 0,29$	Low

Table 3. Effect Size Category

Value	Category
$0,80 \leq d \leq 2,0$	Large
$0,50 \leq d \leq 0,79$	Medium
$0,20 \leq d \leq 0,49$	Small

The implementation of crafts subjects at the 8th-grade junior high school level in Indonesia encompasses diverse fields, such as crafts, engineering, cultivation, and processing (Ministry of Education and Culture, 2018). These domains aim to equip students with essential life skills while fostering creativity and problem-solving abilities. However, conventional teaching approaches often fail to foster deep understanding or sustain student interest (Smith & Henriksen, 2016). Previous research by Naradika et al. (2022) and Saripudin et al. (2022) emphasized the importance of craft education but did not critically explore the integration of digital learning media as a means of addressing engagement challenges. In this study, the development of mobile learning media using iSpring Suite seeks to bridge this gap by offering interactive and structured multimedia content. Nevertheless, the extent to which mobile learning alone can fully address deeper pedagogical challenges—such as students' varied prior knowledge and learning contexts—remains uncertain, warranting further investigation (Crompton & Burke, 2018; Sung et al., 2016).

The development process applied the Instructional Development Institute (IDI) model to structure the media systematically (Churchill et al., 2015), offering a comprehensive learning path for students. Although digital learning tools have been shown to improve engagement (Indra et al., 2021; Khairini & Yogica, 2021), specific applications in craft education remain relatively underexplored. Compared to these prior studies, this research presents an innovative approach; however, challenges such as ensuring accessibility for students with limited device availability and internet access were not fully mitigated. While findings demonstrated the potential of iSpring Suite for enhancing comprehension through multimedia (Bernacki et al., 2020; Ruggiero & Mong, 2015), it is important to recognize that multimedia features alone may not guarantee meaningful learning without considering cognitive load and instructional design principles. Validation conducted by design and material experts indicated the developed media's quality, with a classification of "valid" based on criteria such as visual appeal, user-friendliness, content accuracy, and curriculum alignment (Chen & Tsai, 2021; Joo et al., 2018; Parsazadeh et al., 2018; Troussas et al., 2020). Compared to prior research by Simbolon et al. (2021), Yani and Darmansyah (2020), and Ulfa and Hakim (2020), this study offers an advancement by incorporating adaptive multimedia elements. However, the validation was limited to expert judgment and lacked empirical validation involving a larger, more diverse student sample, which could have increased the generalizability of the findings. Theoretically, this research reinforces the role of multimedia-based learning in supporting constructivist learning environments, although further studies should investigate the longitudinal impacts and cross-cultural applicability.

Practicality trials involving both teachers and students yielded positive perceptions, with participants categorizing the media as "very practical." Teachers highlighted the benefits of ease of integration into existing curricula, while students appreciated the interactive and engaging content (Papadakis, 2018). These findings align with Azzahrah et al. (2022) and Dewi et al. (2021), who have emphasized the role of digital media in fostering student engagement. However, self-reported perceptions may be subject to social desirability bias,

and no control group comparison was conducted to measure the relative practicality of the iSpring Suite media against other digital tools. From a practical standpoint, this study suggests that structured mobile media can complement conventional instruction, yet future implementations should address teacher training and technical support to maximize classroom effectiveness. The effectiveness test results further support the success of the developed learning media (Suárez et al., 2018; Sung et al., 2017). The effectiveness of the developed media was evidenced through both descriptive and inferential statistics. The n-gain value of 0.50 (medium category) and an effect size of 1.80 (large category) demonstrate substantial improvements in student learning outcomes. Subsequent analysis, using a paired sample t-test, yielded a t-value of -7.845 with 21 degrees of freedom and a significance level of 0.000 ($p < 0.05$), indicating a statistically significant difference and confirming statistically significant improvements in student comprehension. Compared to prior studies such as Simbolon et al. (2021), which primarily reported qualitative gains, this research provides stronger empirical evidence. Nevertheless, it is critical to note that the quasi-experimental design limits causal claims, and unmeasured variables (such as student motivation or prior experience with technology) could have influenced the results (Chung et al., 2019; Grant, 2019). Thus, while mobile learning media show promise, they should be considered part of a broader pedagogical strategy rather than a standalone solution.

Beyond effectiveness, the mobile learning media demonstrated flexibility, being accessible via computers, tablets, and smartphones (Nikou & Economides, 2017). This accessibility potentially mitigates geographic and socioeconomic barriers to learning, though disparities in device quality and internet connectivity among students may still limit equitable access (Pedro et al., 2018; Sánchez-Prieto et al., 2017). In contrast to earlier studies by Budiman et al. (2021) and Dewi et al. (2021), which primarily explored mobile learning in the context of general education, this research focuses on its implementation within vocational craft education. From a theoretical perspective, this highlights the growing importance of mobile learning frameworks in competency-based curricula, underscoring the need for future instructional designs to incorporate context-aware elements that cater to the diverse demands of various learning environments.

A further significant contribution of this study lies in its influence on the advancement of digital instructional design within vocational education (Vongkulluksn et al., 2018). Unlike earlier research that predominantly focused on static content delivery, this study highlights the relevance of dynamic content updates made possible through platforms such as iSpring Suite, which support curricular adaptability and long-term instructional viability (Martin & Ertzberger, 2016). However, it is essential to recognize that the effective maintenance and ongoing development of such digital learning tools require institutional support and adequate digital competencies among educators—factors that fall beyond the scope of this research. Practically, the findings suggest that developing scalable, updatable mobile learning media can significantly enhance vocational education outcomes, particularly when aligned with emerging educational technology standards and practices (Heflin et al., 2017; Romero-Rodríguez et al., 2020). In conclusion, the development of mobile learning media using iSpring Suite represents a meaningful advancement in craft education through the integration of interactive and adaptive learning experiences (Zydney & Warner, 2016). The structured multimedia integration provides practical implications for enhancing classroom engagement and learning outcomes, while theoretically contributing to the broader field of digital media development. However, this study also highlights methodological limitations, including the absence of a control group, potential biases in self-reported data, and limited sample diversity. Future research should explore the scalability and sustainability of multimedia-based learning across various vocational and practical subjects, ensuring that innovative digital solutions like this can contribute to equitable and effective education across diverse learning contexts (Gan & Balakrishnan, 2018).

CONCLUSION

The creation of mobile learning media utilizing iSpring Suite has demonstrated its effectiveness in addressing challenges related to students' comprehension of craft-related subjects, as reflected in the notable enhancement of their learning outcomes. Through the use of mobile learning technology, students are granted flexible access to instructional materials, enabling self-paced learning and reinforcing understanding beyond the confines of the classroom. The interactive features of iSpring Suite, such as simulations, videos, and interactive assessments, enhance engagement and comprehension, making craft learning more dynamic and enjoyable. The application of the Instructional Development Institute (IDI) model facilitates a systematic and structured integration of technology, instructional design, and educational content, thereby promoting a comprehensive and effective learning experience. The study's results indicate that students who engaged with mobile learning media exhibited enhanced motivation, active participation, and improved understanding relative to those exposed to conventional lecture-based instruction. The research highlights the potential of mobile learning media to overcome infrastructure-related constraints by allowing students to access instructional materials on their devices. The application of these research findings has significant implications for the broader educational field, particularly in enhancing technology-assisted learning strategies in vocational and craft education. In the future, the integration of mobile learning media can be further refined and expanded to other subject areas,

fostering a more innovative and student-centered learning environment.

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