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Research paper

The Development of Instagram-Based Learning Media for the Subject of Engineering Mechanics within the Construction and Property Field at State Vocational High School 3 of Jombang

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ABSTRACT

Background: There is a need to enhance technology incorporation in the Engineering Mechanics learning process. This is primarily due to the monotonous teaching methods employed by teachers. Additionally, the absence of textbooks as learning resources within the educational institution has led to students solely relying on lecture notes, thereby limiting their access to reading materials within the educational setting. The limited accessibility of instructional resources engenders a state of passivity among students, diminishing the learning experience's efficacy. Hence, the primary objective of this study is to develop and analyse the feasibility of Instagram-based learning media as an innovative solution to address these challenges.

Methods: The present study employs the research and development (R&D) methodology, specifically utilizing Sugiyono's development model. The data-collecting technique used questionnaires to obtain primary data; on the other hand, secondary data was used as supplementary documentation.

Results: The findings revealed that an Instagram-based learning media product received a commendable assessment score of 93.94% from material expert validators and 97.7% from media experts. These scores fall inside the highly feasible category, indicating the effectiveness and suitability of the product. In the interim, the students participating in the study achieved a score of 74.33% in the initial trial and 72.3% in the usage trial within the viable category.

Conclusion: The findings of this study indicate that the utilization of Instagram-based learning media products for the engineering mechanics curriculum in the construction and property field at State Vocational High School 3 of Jombang is deemed appropriate.

INTRODUCTION

Learning media refers to various instruments or resources that are utilised to facilitate the teaching and learning process, thereby fostering student engagement and enhancing their acquisition of knowledge (Nurrita, 2018). Learning media can significantly benefit educators in facilitating the teaching and learning process. By incorporating various forms of media, educators can effectively transmit knowledge and information about the learning topic to their students. According to Tafonao (2018), using technology in learning activities enhances their effectiveness by facilitating students' attainment of set learning objectives without encountering difficulties.

Based on the perspectives above, there is a need for enhancement in the use of technology for educational purposes at State Vocational High School 3 of Jombang. This is due to the exclusive utilization of PowerPoint as the primary instructional tool in the learning activities. According to Mahmudah's (2016) research findings, using power points and boards as instructional tools is deemed less efficacious. This assertion is consistent with the viewpoint put forth by Azzahra (2022), which suggests that educational materials utilizing PowerPoint as a learning medium exhibit greater diversity and require regular updates. The primary objective of learning media is to optimize the process of student learning. Consequently, the selection of learning media should be carefully developed to enhance its appeal and captivate students' attention towards the subject (Wardani, 2020).

Another contributing element to the diminished efficacy of educational endeavors inside the school setting is the insufficiency of learning resources, specifically the provision of essential materials such as textbooks. Textbooks are crucial in enhancing the learning process and serve as a valuable resource for learners (Mutaal, 2016). The limited accessibility of instructional resources leads students to not possess reading materials and instead rely solely on classroom-derived notes. According to Hadimu et al. (2020), the traditional approach to education tends to foster passive reception of knowledge among students rather than promoting active knowledge discovery, which is the desired outcome of an independent curriculum. According to Kusuma and Nisa (2019), the limited availability of resources for students to utilize in facilitating the learning process can harm their motivation to learn.

Insufficient proficiency in technology usage contributes to the suboptimal advancement of learning media despite the multifaceted potential of technology as a pedagogical instrument that can facilitate student engagement (Muis, 2021). The prevailing technological advancement in contemporary society is the Internet, which continuously evolves with the proliferation of social networking platforms, such as Instagram. Instagram is widely recognized as a burgeoning

social media tool in contemporary times. According to Iskandar and Isnaeni (2019), Instagram has been found to possess addictive qualities among students. According to Sari (2019), individuals who utilise Instagram tend to spend a significant amount of time engaging with this social media platform. The extensive utilisation of Instagram diverts study time, a crucial component for students.

The author uses Instagram as a social media platform to transform unproductive time into productive time by leveraging it as an educational tool. Instagram features are employed to incorporate educational content about engineering mechanics. According to Primanto (2022), diverse learning media can enhance students' comprehension of educational content. The availability of learning media with engaging technologies motivates students to delve further into the provided material. The primary aims of this study encompassed 1) The Development of Instagram-Based Learning Media for the Subject of Engineering Mechanics within the Construction and Property Field at State Vocational High School 3 of Jombang. 2) This study assesses the viability of utilizing Instagram-based learning media as an alternative learning resource for the Subject of Engineering Mechanics within the Construction and Property Field at State Vocational High School 3 of Jombang.

METHODS

This study employed the Sugiyono (2015:48) model of Research and Development (R&D), which the author adapted to encompass the subsequent stages: (1) Identification of potential issues, (2) Collection of data, (3) Design of the product, (4) Validation of materials and media, (5) Revision of the product, (6) Conducting product trials, (7) Further revision of the product, and (8) Field testing.

The participants involved in the research and creation of Instagram learning media consist of two subject matter experts who are lecturers at the State University of Malang and a teacher specializing in Engineering Mechanics at State Vocational High School 3 of Jombang. On the other hand, the media expert validators are lecturers at the State University of Malang who possess diverse expertise and experience in the media. In addition to individuals with expertise in materials and media, the study also included participants who were students specializing in building and property business at State Vocational High School 3 of Jombang.

The data analysis methodology employed in this study is customized for each participant through the utilization of a scoring algorithm, as delineated by the subsequent formula:

$$P = \frac{\sum x}{\sum xi} \times 100\% \quad (1)$$

Information:

P : Percentage

$\sum x$: Number of respondents' answers to one item

$\sum x_i$: Ideal number of values on an item

After that, conclude the calculation results based on the criteria in Table 1:

Table 1.

Criteria for interpreting assessment scores

Average Scores (%)	Categories
84-100	Excellent
71-83	Good
55-70	Average
40-54	Fair
0-39	Poor

RESULTS AND DISCUSSION

1. Product Design

The produced product is an Instagram account that encompasses educational information about engineering mechanics, with a particular focus on content related to structural elements. The account employs many functionalities of the Instagram application. The product preparation process involves the development of materials that incorporate the fundamental competencies of comprehending the structural components and progression of learning objectives. In the context of generating Instagram-based learning media, the product design involves using graphic content generated or modified through Canva software, as depicted in Figure 1.



Figure 1. Main view of Instagram profile

This profile details the account and the outcomes associated with uploading content. The Instagram account in question is accessible through the following link: <https://instagram.com/bisamektek>.



Figure 2. Image/feed posts

The feed and the profile are situated within the same frame. The platform consists of posted educational materials readily accessible to students to study.

2. Test Results

The outcome of this development is creating an Instagram account encompassing educational information about the Basic Competencies, Structural Elements, and Engineering Mechanics subjects. The instructional materials uploaded to the Instagram account undergo a validation process, including two subject matter experts and a media specialist, followed by student testing.

The validation step of the product involved the participation of two material specialists who provided valuable input, constructive criticism, and insightful suggestions. The media validation assessment tool comprises four components: the appropriateness of

material content, the manner in which the material is presented, the evaluation questions employed, and the utilisation of language. The assessment findings yielded an average score of 93.94% overall. This demonstrates that the content of learning media items is highly appropriate and readily assessable for implementation with students. In the interim, an evaluation conducted by professionals in the media field encompassed four key dimensions: visual elements, media delivery, user accessibility, and language proficiency. The collective assessment yielded an average rating of 97.7%, indicating a highly commendable performance.

Subsequently, the test-use stage is conducted, following the implementation of the initial trial, which is administered to a restricted sample of twenty students who serve as representatives of the target demographic. The preliminary trial findings yielded an average score of 74.33% in the practicable category, indicating that no revisions were necessary. Consequently, the study can proceed to the subsequent phase, namely usage trials. Based on the outcomes of the evaluations conducted by students during this field test, the mean technical quality score was 71.3%. The instructional quality achieved a score of 73.7%, resulting in an overall average score of 72.6%. Based on the findings mentioned above, this particular developmental product exhibits suitability for utilization as an educational medium.

3. Product Excellence

The outcomes of developing this Instagram-based learning media product were generally met with favourable feedback from validators. The evaluation results, as determined by subject matter experts, yielded a percentage of 93.94%, thereby indicating its feasibility. The learning media on Instagram incorporates visual aids and diverse information to enhance students' skills. Additionally, it is tailored to address crucial competencies and learning objectives specific to vocational school students. Consequently, the content on this Instagram platform is pertinent and conducive to developing students' abilities. This notion is supported by the perspective put forth by Sugiharni (2018), which asserts that pertinent content in learning media refers to material or information that is closely aligned with the intended learning outcomes. According to Ridwan et al. (2021), including pertinent content can enhance students' comprehension of concepts, facilitate the application of knowledge in practical contexts, and foster greater engagement in the learning process.

In addition to disseminating content and information, this Instagram-based learning media product also incorporates a range of assessment queries specifically designed to

gauge students' comprehension. Moreover, it employs a communicative and accessible language style to captivate students' interest. Certain aspects of these findings are consistent with the perspective put forth by Lauren et al. (2022), which asserts that the generated information should prioritize accessibility through commonly understood and straightforward language. This viewpoint is corroborated by a further assertion made by Cheppy Riyana (Anum & Novalia, 2020) that the media should possess the capacity to effectively communicate messages or information in a manner that is comprehensible and devoid of ambiguity, a feat that can be accomplished through the utilization of lucid and unambiguous language.

The examination of media expert validators yielded a positive response, with a rating of 97.9% falling within the area of high feasibility. This educational platform is highly appropriate for utilization. The learning media presented in this format consists of visually appealing graphic graphics incorporating various colours. These images are complemented by accompanying photographs and explanatory text, which captivate students' attention. This assertion is substantiated by the perspective put forth by Anggraini (2018), who posits that visual media employs written content and vibrant hues to captivate a larger audience of students. This educational medium also presents visually appealing typography and decorative elements that align with the intended theme. The learning media effectively organizes the colour selection and content structure, resulting in visually appealing visuals within the uploaded content. This aligns with the assertion by Liu et al. (2021) that including creativity in utilizing colour effects, font variations, supporting stickers, and a well-organized layout can enhance the visual appeal of uploaded content. According to Lubis and Yuangga (2022), utilizing visual content in educational settings can prove advantageous because it elucidates intricate topics, facilitating enhanced student comprehension.

The Instagram-based learning media is readily accessible and user-friendly. Additionally, it proves to be an effective tool due to its utilization of various features, such as Instagram stories that incorporate quizzes and educational content. These features are conveniently accessible through the highlight feature, making the learning process more accessible and convenient. The experience may elicit feelings of tedium. This aligns with the perspective of Oloruntoba and Kutu (2022), who argue that Instagram offers advantages in terms of accessibility due to its extensive reach and ease of access for many students. According to Setyawan and Novianto (2022), the diverse range of Instagram features, such as quiz stickers, question responses, and comments, might facilitate teachers in promoting active engagement and assessing students' comprehension.

The student's response to this Instagram-based learning media was also commendable, as demonstrated by the trial usage statistics, indicating a score of 72.53% in the adequate category. The students revealed notable enthusiasm in acquiring the skills necessary to utilize Instagram. A few individuals went as far as actively searching for the *bisamektek* Instagram account to familiarise themselves with its content before receiving instructions from the researcher. This study demonstrates that students exhibit heightened enthusiasm and engagement in the learning process when instructional content is presented distinctly, leveraging various features of Instagram. These features encompass feeds and Instagram stories, incorporating interactive elements such as quizzes, polls, and questions to facilitate evaluative inquiries. Additionally, using Instagram account highlights enables the dissemination of video links about educational resources, thereby enhancing student accessibility. This perspective is consistent with the one expressed by Erarслан (2019), who argues that utilising Instagram features like feeds and Instagram stories may foster an engaging and dynamic learning environment. According to Nevyra (2021), using Instagram characteristics might enhance the appeal and engagement of learning, hence fostering increased student participation. The assertion made by Fitriyani, Indah Pujiastuti, and Legi Elfitra (2020) further supports the viewpoints mentioned above, suggesting that Instagram can serve as an innovative tool for enhancing the learning process.

4. Product Shortcomings

In general, the outcomes of developing this Instagram-based learning media product garnered favourable feedback from both validators and students. The evaluation results conducted by specialists in the field yielded a percentage of 93.94%, indicating a high level of feasibility for the learning media product. However, some criticisms were raised regarding the suitability of the materials used and the language employed in the product. The educational content provided in this Instagram-based learning media, accessible through Instagram, focuses only on a fundamental skill set, specifically analysing and discussing structural aspects. Generating content that incorporates specific material can take time due to the inherent difficulty of conceptualizing a suitable theme and making necessary adjustments during the revision process. According to professionals in the field, it is necessary to revise and update the content that has been generated and submitted. The developed content has been suitably modified to align with the intended learning outcomes. It has comprehensively addressed various aspects related to the construction of structures. However, there is a need for more elaboration to enhance students' engagement and prevent potential disinterest when comprehending the subject matter. This kind of action is

consistent with the viewpoint expressed by Rulita et al. (2021), which suggests that students may experience a rapid decline in engagement and require increased concentration when presented with excessive instructional content. According to Ningsih (2020), excessive exposure to reading materials for extended periods might lead to student disengagement and boredom throughout the learning process.

The nomenclature of the language component in this educational medium has been appropriately designated, with an average attainment score of 92% falling within the commendable range. Nevertheless, it is necessary to assess certain aspects, like using words that may be foreign to students attending vocational schools. In addition, it is worth noting that numerous terms have dual interpretations, making them challenging for students to comprehend. This viewpoint aligns with the perspective of Ningtyas and Yuniarta (Nerita et al., 2018), who argued that employing sentences and words with ambiguous connotations is comparatively less efficacious and may necessitate students to possess a greater comprehension of the subject matter. According to Dewi (2019), it is also argued that using ambiguous language can lead to misinterpretations regarding the subject under investigation.

The Instagram-based learning media utilizes visual representations through photographs to illustrate various structural aspects. Regarding visual evaluation, the overall score was 97.3%, indicating a high level of proficiency in this category. However, it is necessary to assess various aspects, including the inclusion of supporting visual aids such as images or photographs. Some of these visuals may be of a smaller size and require higher resolution to enhance clarity. In addition, there is a variation in the resolution and clarity of the photographs submitted to this Instagram-based learning media. Specifically, the images appear noticeably clear when accessed through the Android operating system. In contrast, the visual appearance will be readily apparent when reached through the iOS operating system. This is consistent with the viewpoint expressed by Sari and Susilawati (2022) that uploading outcomes through the iOS platform yields more accuracy and seamless performance.

In addition to the elucidation mentioned above, another aspect warranting enhancement in this Instagram-based learning media pertains to the inclusion of a quiz element within Instagram stories. A limitation exists within the interactive sticker function of Instagram stories, whereby specific assessment questions, including quizzes and open-ended inquiries, become inaccessible for selection or response after 24 hours from their posting. Nevertheless, it remains accessible through the highlights section of the profile. In

order to address assessment inquiries that need to be more amenable to resolution through the interactive sticker functionality, an alternate approach was adopted, involving the provision of responses through the designated message column accompanying each Instagram story upload. Certain aspects align with the viewpoint given by Laily et al. (2022) that the Instagram stories functionality has a limited duration of 24 hours, resulting in the automated removal of posted content from Instagram stories. According to Aldira (2020), it is suggested that Instagram users can retrieve previously uploaded content from their Instagram stories by archiving it in the highlight feature. This allows for the visibility of content surpassing the 24-hour time limit, as displayed in the highlight feature on the user's Instagram profile.

CONCLUSION

The outcome of developing this learning media product is an Instagram account that incorporates visually appealing material components and effectively uses several features of Instagram, including feeds, Instagram stories, and highlights, to captivate students' interest in using social media for learning purposes.

The research findings have yielded highly viable standards determined by expert material and media validators. On the other hand, the evaluations provided by the students were acquired within the realm of practicality. The various features offered by Instagram, including feeds, Instagram stories, and highlights, can captivate curiosity and garner attention. Moreover, these elements can potentially engage students in active learning, infusing the educational process with excitement and enjoyment. Hence, using Instagram-based learning media can effectively enhance the learning experience in engineering mechanics subjects. Consequently, the developed Instagram-based learning media is deemed appropriate for implementation.

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