

## THE DEVELOPMENT OF INSTAGRAM FILTER-BASED LEARNING MEDIA FOR MATHEMATICS IN JUNIOR HIGH SCHOOL

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### Article History

Received: 09-01-2023

Revision: 25-02-2023

Accepted: 18-03-2023

Published: 12-04-2023

**Abstract.** The rise of the digital age and STEM-based occupations (Science, Technology, Engineering, and Mathematics) has increased the significance of mathematics skills in the workplace and in the classroom. At the same time, the usage of social media such as Instagram, as well as Instagram's effects and filters, has become widespread among adolescents, particularly students. The purpose of this study is to develop an Instagram filter-based learning media for junior high school students. The material used in the development of the Instagram filter is the material on Relations and Functions that is difficult to understand by students based on a student needs questionnaire. This study developed an Instagram-based learning media by administering validation and feasibility tests to material experts, media experts, and student response questionnaires in the form of a small-scale trial. The designed Instagram filter-based learning media received an average score of 83.22 percent with a very good interpretation based on the validation and feasibility tests.

**Keywords:** Mathematics learning media, Relations, Functions, Instagram filter

**Abstrak.** Perkembangan era digital dan profesi berbasis STEM (*Science, Technology, Engineering and Math*) menguatkan perannya penguasaan kemampuan matematika di tempat kerja dan di sekolah. Di sisi lain, penggunaan media sosial seperti Instagram beserta efek dan filter Instagram menjadi hal umum di kalangan remaja terutama pelajar. Tujuan dari penelitian ini adalah untuk mengembangkan media pembelajaran berbasis filter Instagram untuk siswa di Sekolah Menengah Pertama. Materi yang digunakan dalam pembuatan filter Instagram adalah materi Relasi dan Fungsi yang sukar dipahami oleh siswa berdasarkan angket kebutuhan siswa. Penelitian ini mengembangkan media pembelajaran berbasis filter Instagram dengan melakukan uji validasi dan kelayakan kepada ahli materi, ahli media, dan angket respon siswa dalam bentuk uji coba pada kelompok kecil. Dari hasil uji validasi dan kelayakan, media pembelajaran berbasis filter Instagram yang dikembangkan mendapatkan nilai rata-rata 83,22% dengan interpretasi sangat baik.

**Kata Kunci:** Media pembelajaran matematika, Relasi, Fungsi, Filter instagram

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**How to Cite:** Gusti, V. Y. K., Nisa, U. K., Aprianti, R., Nadiyyah, K & Aldino, E. R. (2023) The Development of Instagram Filter-Based Learning Media for Mathematics in Junior High School. *Indo-MathEdu Intellectuals Journal*, 4 (1), 01-09. <http://doi.org/10.54373/imeij.v4i1.62>.

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## INTRODUCTION

The global trend toward Science, Technology, Engineering, and Mathematics (STEM) based occupations has made mathematical proficiency crucial in modern culture. Good mathematics abilities are not only necessary in the job market business, but also serve to

differentiate employee earnings and rates (Jonas, 2018). Despite the importance of mathematics in the modern era, Indonesia continues to encounter difficulties in the field of mathematics education, and the quality of learning is not providing the desired outcomes. In mathematics, Indonesia earned 379 on the 2018 Program for International Student Assessment (PISA), whereas the average score for OECD nations was 489 points. This information ranks Indonesia seventh-worst in mathematics among the 79 nations that participated in PISA (OECD, 2019; Schleicher, 2018). There are several variables that might influence mathematics achievement among students. Among these are interest and motivation. These two criteria continue to play a significant role in determining the effectiveness of mathematical education (El-Adl & Alkharusi, 2020; Tambunan, 2018; Yu & Singh, 2018). Several studies demonstrate the poor interest and desire of Indonesian children to learn mathematics, as well as the need for modifications to mathematics teaching, teacher delivery, and school programming (Pohan et al., 2020; Putri & Syahputra, 2019).

Social media could be the answer. During the pandemic, almost all learning activities were impacted and many schools decided to conduct distance learning. This situation made students frequently use their mobile phones for academic, entertainment, or social purposes. Based on the research by Lasmiasih (2019), teenagers, especially students, are closely influenced by social media. This situation not only occurs during the pandemic but has also happened long before the pandemic. Instagram is one of the social networking platforms that is most visited. Data from Sensortower (2021) shows that Instagram is the top social media that ranks third as the most downloaded application and its usage is almost in every corner of the world. In addition to social networking, Instagram also has filters that can be used by its users to manipulate the real world with virtual objects. These Instagram filters utilize Augmented Reality (AR) that can be created using the Spark AR program, where the content in the virtual world can be connected to the real world. This is an opportunity for teachers to use it as a learning media for students in learning mathematics.

Numerous research have investigated the use of social media platforms such as TikTok and Instagram for language acquisition (Agustin & Ayu, 2021; Auly et al., 2021; Erarslan, 2019). However, only a small number of research have examined the use of Instagram filters for mathematics education. The development of Instagram filter-based learning media for mathematics is expected to increase students' interest and motivation in learning mathematics. This study aims to develop Instagram filter-based learning media for junior high school students and to determine its feasibility as a learning media. The material used is the material on relations and functions, which are difficult to understand by students based on a student

needs questionnaire and studies conducted by Yanti et al. (2019) as well as Ramadan and Arfinanti (2019). This research develops Instagram filter-based learning media by conducting validation and feasibility tests to material experts, media experts, and student response questionnaire in the form of a small group trial.

## **METHOD**

This study is a R&D (Research and Development) research which employed an ADDIE model. The ADDIE model consists of five steps: analysis, design, development, implementation, and evaluation. The study has been conducted at SMPN 85 South Jakarta. SMPN 85 is located at Jl. Margasatwa No. 8, RT. 15/RW. 1, Pd. Labu, Kec. Cilandak, South Jakarta, Indonesia.

The data collection of the study used validated questionnaires and a Likert scale. The questionnaire was developed based on a review of relevant literature and was validated by four expert judges. The Likert scale consisted of five points, ranging from "strongly agree" to "strongly disagree".

The study sample consisted of 36 high school students from SMPN 85 South Jakarta. The students were selected through random sampling. The questionnaire was administered to the students at the beginning of the study to determine their needs and preferences. After the product was created and validated, it was used by a small-scale group consisting of 9 students for a period of class meeting (120 minutes). At the end of the meeting, the students were administered the same questionnaire to obtain their feedback on the product.

The data collected from the questionnaire was analyzed using descriptive statistics. The results were then presented in percentage and tables. Overall, the use of a Likert scale and student questionnaire was effective in obtaining information on the needs and preferences of the students, as well as their feedback on the product.

## **RESULTS**

This study produced a learning media product in the form of an Instagram filter on the topic of relations and functions. The Instagram filter is divided into three parts: introduction to the topic and instructions for use, questions and answer options, and the final result. The Instagram filter is also equipped with audio-visual media in the form of background music and image icons that spark the curiosity of students. The Instagram filter is interactive and can be played directly on the Instagram application.



Figure 1. Introduction to the Filter and Use Instruction



Figure 2. Sample of Relation & Function Question



Figure 3. Sample of Relation & Function Question and Answer Options



**Figure 4.** An Example of When the Answer Is Correct



**Figure 5.** An Example of When the Answer Is Incorrect

There are 10 questions in the Instagram filter that cover the topic of relation and function. The final visual result on the Instagram filter is also displayed based on the students' ability to answer the questions. If the student answers 0-3 questions correctly, the message "Try Again" will appear. Then, if the student answers 4-5 questions correctly, the message "Good Job" will appear. Then, if the student answers 6-7 questions correctly, the message "Awesome" will appear. Finally, if the student answers 8-10 questions correctly, the message "All Star" will appear.



**Figure 6.** First Variation of Final Answer Results



**Figure 7.** Second Variation of Final Answer Results

The result of validation test by subject matter and language experts showed that the overall assessment percentage for all aspects was 91.81%. Meanwhile, the result of validation test by media experts showed that the overall assessment percentage for all aspects was 88.33%. Moreover, the results of the small group trial showed that the overall assessment percentage for all aspects was 83.96%. This suggests that the Instagram filter-based learning media that has been developed is interpreted as very good.

## DISCUSSION

The feasibility test of the Instagram filter was conducted using an empirical test employing the questionnaire method to experts in subject matter and language, experts in media, and students. The validation test by subject matter and language experts aims to determine the level of validity of the questions in the Instagram filter in terms of the subject matter of the learning material, which is on the subject of relations and functions. The subject matter experts involved were two mathematics lecturers from the Faculty of Teacher Training and Education, Universitas Terbuka. The assessment was given through the subject matter and language

validation questionnaire. The result of validation test by subject matter and language experts showed that the overall assessment percentage for all aspects was 91.81%. This suggests that, from a linguistic and subject-matter standpoint, the material on relations and functions in Instagram filter is interpreted as very good. On the basis of these findings, it can be concluded that the material on relations and functions in Instagram filters that has been developed is suitable for use in mathematics learning.

The second test is a validation test by media experts. The validation test by media experts aims to determine the level of validity of the Instagram filter-based learning media in terms of its usefulness as an online learning medium. The media expert involved was a lecturer in Educational Technology at Universitas Terbuka. The assessment was given through the media validation questionnaire. The result of validation test by media experts showed that the overall assessment percentage for all aspects was 88.33%. This indicates that the Instagram filter-based learning media that has been developed, in terms of screen design appearance, ease of use, graphics, usefulness, and consistency, is interpreted as very good. Based on these results, it can be concluded that the Instagram filter-based learning media that has been developed is suitable for use as an online learning medium in mathematics education.

The final test is a small group trial by students. The purpose of the small group trial is to obtain responses from students as the target users and also as an evaluation material for the Instagram filter-based learning media after the medium has been revised based on the results of the validation by subject matter and media experts. The expected information is not only about the quality of the Instagram filter, but also how the Instagram filter can be used as an online learning medium in mathematics education activities. The small group trial was limited to 9 students in grade 8 at SMPN 85 South Jakarta. The assessment was given through the student response questionnaire. The results of the small group trial showed that the overall assessment percentage for all aspects was 83.96%. This suggests that the Instagram filter-based learning media that has been developed is interpreted as very good. The suggestions given by the small group of students were to create more interesting images and use music as the background. The results of the validation test and small group trial show that the Instagram filter-based learning media is suitable for use as a learning medium in mathematics lessons.

## CONCLUSION

This study produced a digital mathematics learning media product in the form of an Instagram filter on the topic of relations and functions. Based on the results and discussion, it was concluded that the Instagram filter-based learning media that was developed is suitable for



use as a digital learning medium in mathematics education for junior high school students on the topic of relations and functions. This is evidenced by the results of the validation test with experts and the small group trial with students, which obtained an overall average percentage of 83.96% which is interpreted as a very good.

## RECOMMENDATIONS

Several recommendations have been made by the researchers:

- A) The product in the form of a new Instagram filter has only reached the implementation stage in a small group. This research can be continued to the evaluation stage by conducting field trials to evaluate the effectiveness of the Instagram filter in mathematics education.
- B) The effectiveness testing of Instagram filter-based learning media can be carried out to determine the learning motivation, learning outcomes, and critical thinking skills of students.
- C) Instagram filters as a learning medium can be applied to other subjects, so that students can learn in a pleasant condition and can be done wherever the students are.

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