



Developing Learning-based Instagram Media on Derivative

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Abstract

This study aims to develop learning media using Instagram and determine its feasibility. This research method used Research and Development (R&D) with the ADDIE development model through 5 stages, namely Analysis, Design, Development, Implementation, and Evaluation. The research was conducted at SMA N 1 Ngemplak. The data collection technique used a validation questionnaire conducted by two teachers and one lecturer and students response questionnaire. The data analysis techniques were descriptive qualitative and quantitative. The result of this research was a derivative learning media in the form of videos presented through Instagram. The feasibility test results showed that the learning media had met three eligibility criteria for learning media. The assessment of media and material experts showed that learning-based Instagram media was in the good category. Based on students' assessment, learning media's feasibility based on Instagram social media was good to use. The correlation between the students response questionnaire and the learning outcome test also showed a unidirectional and significant correlation. It indicated that there was a correspondence between the questionnaire scores and the learning outcome test scores. Based on these results, learning media through Instagram social media is suitable for the learning process.

Keywords: derivative, Instagram, learning media

INTRODUCTION

The use of information and communication technology is currently very rapid, whether used in economics, politics, society, and education. In the world of education, Information and Communication Technology is used in the learning process. Rosenberg in Sudibyo (2011), with the development of information and communication technology, has made several changes in the learning process, namely from studying in the classroom to learning anywhere and anytime and from paper to the internet. In line with this, Zulfiati (2014) and Suprpto et al. (2019) state that learning using information and communication technology-based media positively affects students' cognitive and affective abilities. One of the internet-based platforms is social media. Social media use in classroom learning needs to be done because in the era of globalization students cannot be

separated from social media (Ruski & Sholeh, 2019). Pilgrim & Bledsoe (2012) stated that social media's influence in the era of advanced technology was desirable to young people. So that social media is beneficial if it can be used as a learning medium.

Based on a survey of 100 junior high school students in Bandar Lampung, almost 98% of students have social media accounts such as Facebook, Twitter, and Instagram, and 94% of students always use the internet to do school work (Irwandani & Juariyah, 2016). The current social media that students often use is Instagram.

Instagram is a photo and video-sharing application that allows users to take photos, take videos, apply digital filters, and share them with various social networking services, including Instagram itself (<https://id.wikipedia.org/wiki/Instagram>). In the learning process, one of the ways to

develop instructional media is learning videos that can be accessed anytime and anywhere, for example, through Instagram.

Many students have difficulty understanding the concept of derivatives (Maharaj, 2013). This difficulty is due to derived material that emphasizes procedural understanding rather than conceptual understanding. Tall (1992) suggests students use function graphs to see changes in gradients and use computer programs to understand the concept of derivatives.

This study's purpose is to develop learning media using Instagram in derivative material. Therefore, it can help students in the mathematics learning process in high school.

METHOD

This research method uses the Research and Development (R&D) method, which is a process used to develop and validate research products (Setyosari, 2010). Sugiyono (2017) also argues that research and development methods are research methods used to produce specific products and test these products' effectiveness.

The development model that is the reference in this study is the ADDIE model. The ADDIE model was developed by Dick & Carey (1996), which consists of Analysis, Design, Development, Implementation, and Evaluation. The following is a chart of the development model used by the ADDIE model.

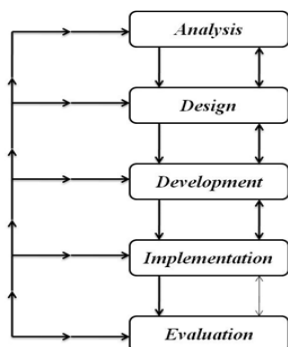


Figure 1. ADDIE Model Chart

This study's data collection techniques are as follows: 1) questionnaire for media and material validation; product validation by

media experts and material by lecturers and mathematics teachers. This validation was carried out to assess the feasibility of learning Instagram developed in terms of material, appearance, and effectiveness. Comments and suggestions from the validator are considered for improvement. 2) Student response questionnaires are used to determine students' responses to the products being developed. Suggestions from students are then considered for revising the product. The measurement scale used for the media validation questionnaire and student responses was a Likert scale. The technique of data analysis was done by descriptive qualitative and quantitative.

The supervisors, expert lecturers, gave the qualitative data in input, corrections, suggestions, and criticisms to learning devices. These data were selected for relevance by researchers, and suggestions that are considered relevant are then used as material for revising Instagram videos. Quantitative data in the form of an assessment score, namely: Very Good = 5, Good = 4, Enough = 3, Less = 2, Very Less = 1. The data obtained by the questionnaire method were analyzed using descriptive analysis techniques, while the qualitative data in the form of a remarkable statement, good, adequate, insufficient, and very poorly converted into quantitative data by clarifying it into five intervals.

Assessment of the quality of Instagram videos contains several aspects, namely the assessment of material experts, media experts, teachers, and high school students based on input data in the form of assessment sheets using a Likert scale with a score of 1, 2, 3, 4, 5 changed from qualitative to quantitative form. Then the data is calculated the average score of each aspect, and the criteria are assessed by the formula (Sudjana, 2010) as follows:

$$\bar{X} = \frac{\sum X}{n} \quad \text{where}$$

\bar{X} : average score for each aspect

$\sum X$: total score

n : number of appraisers

The data obtained for each of the aspects that have been developed into indicators are then tabulated and analyzed.

RESULTS AND DISCUSSION

This research produces learning media products for Instagram in a specialization mathematics subject with the title "Developing Learning-based Instagram Media on Derivative". The primary material for derivatives presented consists of the concept of derivatives and how to find derivatives.

The development of learning media based on Instagram social media through 5 stages, namely Analysis, Design, Development, Implementation, and evaluation, was carried out on derivative material for class XI students in senior high school. Creation using power points and combining parts of the video using Adobe Premiere Pro CS6. Adobe Premiere Pro CS6 is a video processing software that is very popular and has been recognized for its sophistication, complete facilities, and extraordinary ability to process videos.

Media and material experts validate learning Instagram products, then tested on a small scale. The aim of validating process is to obtain input that will be considered for improvement so that an appropriate and useful learning Instagram product is obtained for students.

The following is a display of the Instagram learning video.

a. Opening appearance

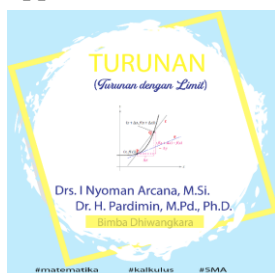


Figure 2. The opening display of the Instagram

Figure 2 is the opening part of an Instagram video using Adobe Illustrator. The Instagram learning video is begun with the appearance of

an image bearing the material and composer after the university logo appeared.

b. Display material title and author

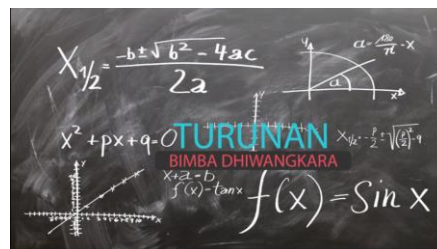


Figure 3. Display of material title and author

In this section, there is the title of the material to be studied and the author's name.

c. Positive and Negative Gradient Material Display

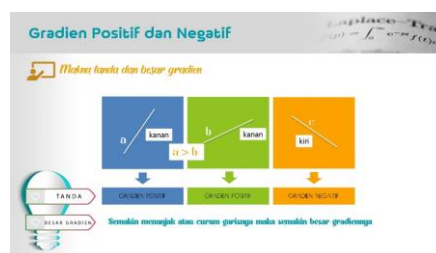


Figure 4. Positive and Negative Gradient Display

The video is begun with the appearance of the sign meaning subtitles and the size of the gradient. After that, it appears three lines with different slopes in sequence along with their descriptions.

d. Display Definition of Derivatives and Derivative Notation

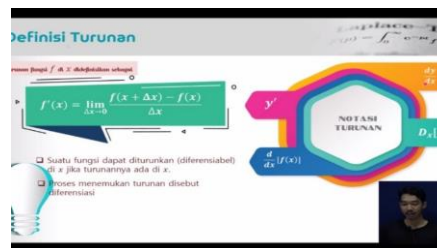


Figure 5. Display Definition of Derivatives and Derivative Notation

It begins with the emergence of an image bearing the definition of a derivative, followed

by the appearance of several derived notations.

e. Example Problem Display

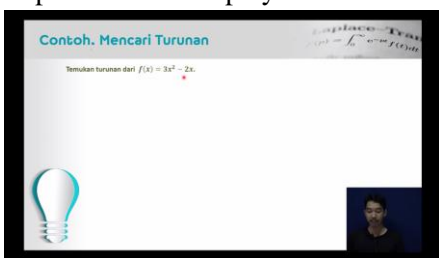


Figure 6. Display Example Problem

It begins with the emergence of writing examples of looking for derivatives. Next comes a question about derivatives.

f. Display Example Problem Solution 1

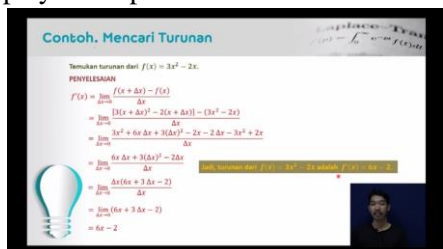


Figure 7. Display of solving an example problem

A few seconds after the question appears the solution of the question will be displayed in stages.

g. Closing View

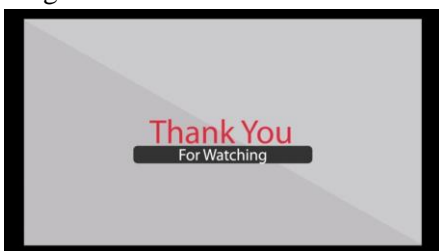


Figure 8. Closing View

The closing was not made using Microsoft PowerPoint, but using Adobe After Effects.

There are three aspects assessed by media and material experts: material suitability, aspects of material presentation, and media design aspects. The summary of the

validation results by media and material experts is presented as follows.

Table 1. Summary of Validation Results of Media and Material Experts

No.	Aspects assessed	Average	Category
1.	Suitability of material	4.33	Very Valid
2.	Feasibility of material presentation	3.87	Valid
3.	Media design	3.59	Valid
Average		3.93	Valid

Based on the assessment of the material suitability aspect consisting of 2 question items, an average score of 4.33 was obtained, and it was categorized as valid. In the presentation aspect, the material is categorized as valid with an average score of 3.87 and consists of 5 question items. Furthermore, the media design aspect obtained an average score of 3.59 with 13 questions and was categorized as valid. Overall, the average rating by media and material experts was 3.93. Based on media and material experts, video Instagrams on derivative material in high school using Microsoft power points are suitable for learning.

The trial was carried out in one stage, namely limited field trials. Limited field trials were carried out on five students of Class XI IPA.

Table 2. Summary of Field Trial Results

No.	Aspects assessed	Average	Category
1.	Suitability of material	3.83	B
2.	Presentation of material	4	B
3.	Video appeal	3.6	B
4.	The benefits of video	3.6	B
Average		3.5	B

Table 2 shows the results of the assessment of derivative learning in high school using Instagram. Based on the students'

assessment, it obtained an average score of 3.5 in the good category with an average of 3.83 material suitability aspects, material presentation score is 4, video attractiveness score is 3.16, and the video's useful aspect is 3.6. In line with Akbar & Komarudin (2018), their research shows that the learning media in the form of mathematics learning videos assisted by social media Instagram developed are suitable for use as learning media. The field trial results are indicated by the results of the feasibility test assessed by experts, namely material experts with a score of 88.8 and media experts with an average score of 93.5 with very feasible criteria.

Based on the description above, it can be concluded that the feasibility level of Instagram learning media on derivative material by media and material experts, and also students are in a good category. Research on social media Instagram as a learning medium in the learning process has also been conducted previously by Irwandani & Juariyah (2016) with the title "Pengembangan Media Pembelajaran Berupa Komik Fisika berbantuan Sosial Media *Instagram* sebagai Alternatif Pembelajaran". The conclusions obtained from this research are Instagram assisted learning media can be used as alternative learning because of its nature that can be accessed anytime and anywhere. The validation results by the product expert for the development of learning media for physics comic memes assisted by social media Instagram were declared worthy of being forwarded. So that Instagram learning media is suitable for use in the learning process.

CONCLUSION

The development of derived learning media presented through Instagram contains positive and negative gradients, differentiation quotient, the slope on a general curve, looking for a gradient with the limit approach, and derivative of a function. The Instagram can be accessed by typing "math.asik" after entering

the Instagram application. This learning media's specialty is the gradual presentation of material accompanied by sound, which can be accessed anywhere and anytime.

The development of learning media using Instagram on derivative material in high school is feasible with an average score of 3.93 on material suitability, material presentation, and media design based on media and material experts. Based on the students' assessment of the feasibility of learning media for Instagram with an average score of 3.5, it is in a good category. The derivative learning media presented through Instagram is suitable for students in learning mathematics for class XI at SMA Negeri 1 Ngemplak.

REFERENCES

- Akbar, R. R. A. & Komarudin, K. (2018). Pengembangan video pembelajaran matematika berbantuan media sosial instagram sebagai alternatif pembelajaran. *Desimal: Jurnal Matematika*, 1(2), 209–215. <https://doi.org/10.24042/djm.v1i2.2343>
- Dick, W. & Carey, L. (1996). *The systematic design of instruction, 4th ed.* New York: Harper Collins College Publishers.
- Irwandani, I. & Juariyah, S. (2016). Pengembangan media pembelajaran berupa komik fisika berbantuan sosial media instagram sebagai alternatif pembelajaran. *Jurnal Ilmiah Pendidikan Fisika Al-Biruni*, 5(1), 33–42. <https://doi.org/10.24042/jpifalbiruni.v5i1.103>
- Maharaj, A. (2013). An APOS analysis of natural science students' understanding of derivatives. *South African Journal of Education*, 33(1), 1–19. <https://doi.org/10.15700/saje.v33n1a458>
- Pilgrim, J. & Bledsoe, C. (2012). An investigation of technology in the classroom and its impact on literacy education. *English in Texas*, 42(2), 45–49.

- Ruski, R. & Sholeh, Y. (2019). Pembelajaran *project based learning* dengan menggunakan sosial media You Tube pada mata kuliah media pembelajaran. *JPEK (Jurnal Pendidikan Ekonomi Dan Kewirausahaan)*, 3(2), 151–158. <https://doi.org/10.29408/jpek.v3i2.1667>
- Setyosari, P. (2010). *Metode penelitian pendidikan & pengembangan*. Jakarta: Prenada Media Grup (Kencana).
- Sudibyoy, L. (2011). Peranan dan dampak teknologi informasi dalam dunia pendidikan di indonesia. *Widyatama*, 20(2), 175–185. Retrieved from <http://download.portalgaruda.org/article.php?article=268282&val=7107&title=Peraan>
- Sudjana, N. (2010). *Penilaian hasil proses belajar mengajar*. Bandung: PT. Remaja Rosdakarya.
- Sugiyono. (2017). *Metode penelitian kuantitatif, kualitatif, dan R&D*. Bandung: Alfabeta.
- Suprpto, E., Apriandi, D., & Pamungkas, I. P. (2019). Pengembangan e-book interaktif berbasis animasi bagi siswa sekolah menengah kejuruan. *ANARGYA: Jurnal Ilmiah Pendidikan Matematika*, 2(2), 124–130. <https://doi.org/10.24176/anargya.v2i2.4089>
- Tall, D. (1992). Conceptual foundations of the calculus. *Proceedings of the Fourth International Conference on College Mathematics Teaching*, 73–88.
- Zulfiati, H. M. (2014). Pengaruh pembelajaran IPS berbasis ICT (*Information and Communications Technology*) dengan aplikasi lectora inspire dalam meningkatkan hasil belajar siswa. *Jipsindo*, 1(1), 39–58. <https://doi.org/10.21831/jipsindo.v1i1.2878>