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Design of Video Tutorial Media with Explicit Instruction Method to Optimize Informatics Learning in Grade 10

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ABSTRACT

The purpose of this study was to design video tutorial media using the Explicit Instruction method to optimize informatics learning in grade 10. Explicit Instruction was selected because it emphasizes systematic, direct, and structured teaching, which is particularly suitable for technical subjects like informatics. This method provides clear guidance, modeling, and step-by-step explanations that help students understand complex procedures more effectively. It ensures that learners are actively guided through each stage of the learning process, making it ideal for developing instructional videos. The primary objective of this study was to develop video tutorial media and measure its contribution to enhancing student comprehension in informatics. This study employed a Research and Development (R&D) approach and tested the optimization using a one-group pretest–posttest design. The development process followed the 4D model. Results from media expert evaluations indicated a feasibility score of 80%. Statistical analysis revealed a significant improvement in students' understanding of the learning material, as indicated by an increase in test scores from 55.2 (pretest) to 89.0 (posttest). The study concluded that video tutorial media utilizing the Explicit Instruction method can effectively optimize informatics learning, especially for technical materials that require structured teaching.

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1. INTRODUCTION

In educational activities, an appropriate approach is required to facilitate student learning, especially in informatics subjects. The use of technology, media, methods, and appropriate tools in the classroom can improve learning outcomes. *Integrating technology into education* is one of the efforts to enhance student learning outcomes (Suyuti *et al*., 2023).

Teaching methods are a key aspect in improving student achievement. One of them is *explicit instruction*, which emphasizes clear and structured teaching. *Explicit Instruction* is a teaching approach that explains material face-to-face, directly, gradually, and systematically, helping students more easily learn and understand the material being taught (Nursiah, 2022). This method is highly suitable for application in informatics subjects because many concepts and technical skills, such as programming, algorithms, and the use of software, require gradual understanding and structured practice. With an explicit approach, teachers can model problem-solving steps, provide guidance in practice, and ensure students understand the basics before moving on to more complex levels (Muhammad *et al.*, 2024).

Well-designed video tutorial media can make it easier for students to understand basic concepts (Putri & Mukti, 2024). By using the *explicit instruction* method and video tutorial media, it is hoped that student understanding will increase in informatics learning. Video tutorials simplify learning by combining visual elements with step-by-step explanations, allowing students to directly see how a process or concept works (Utari *et al.*, 2020). The visual presentation can clarify abstract or complex material, such as programming syntax or algorithm flow, while the sequential instruction mirrors how students naturally learn: from observing, imitating, and then practicing. Moreover, students can pause, rewind, and rewatch the tutorials at their own pace, which supports better retention and individualized learning, especially valuable in subjects like informatics that involve technical skills and logical thinking (Bustanil *et al*., 2019).

Although there have been many studies on video tutorials, there are still few that examine this method in the context of vocational schools. In addition, there has been no in-depth research on video tutorials with the explicit instruction method in informatics learning. Most of the existing research focuses on general subjects, while specific applications in vocational school environments, especially in informatics subjects such as Excel, are still limited. This subject is very technical and procedural, so it is very suitable for a visual and structured instructional approach, such as combining video tutorials with *explicit instruction*.

This study aims to design video tutorial media using the *explicit instruction* method to optimize informatics learning, referring to the extent to which grade 10 informatics education in vocational high schools can be enhanced through such media. The research focuses on Microsoft Office elements, particularly Microsoft Excel. It is expected that this study will contribute to the effective application of media and instructional methods in informatics education, serving as a reference for educational institutions seeking to optimize learning practices.

The problems that are the focus of this study are: (1) How to design video tutorial media with the *explicit instruction* method for informatics learning for grade 10 informatics learning; (2) How optimal is the video tutorial media with the *explicit instruction* method in improving student learning outcomes in informatics subjects.

This study aims to: (1) Design video tutorial media using the *explicit instruction* method for grade 10 informatics learning; (2) Determine the effectiveness of such media in improving student learning outcomes in informatics subjects.

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2. METHODS

2.1 Research Type

This study uses Research and Development (R&D)**,** which is tested for optimization **using** a one-group pretest–posttest design (Ardiansyah *et al*., 2023). The development model applied is the 4D model *(Define, Design, Develop, Disseminate).*

The 4D model is used because it provides a systematic structure for the process of creating learning media, starting from identifying needs to limited dissemination. The development procedure is carried out through four main stages:

a. Definition *(Define)*

This stage identifies and formulates basic needs that must be met (Aulia *et al*., 2024). Activities at this stage include an initial analysis of student learning needs and the optimization of previous teaching methods. In addition, this stage involves the formulation of learning objectives, determining learning outcome targets, and defining indicators of learning objective achievement *(KTTP)*.

b. Design

This stage involves planning the media and tools to be used in the learning process. The activities include the preparation of storyboards for the video tutorial media, which serve as visual outlines to guide the video production process. Next, learning media scripts are written to ensure that the content delivered in the video aligns with the learning objectives and follows a clear instructional flow. Additionally, research instruments are developed, including pretest and posttest questions to measure learning outcomes, as well as interview guides and observation sheets to support qualitative data collection. Finally, a learning evaluation system is designed based on the *KTTP*, ensuring that assessments are aligned with the expected behavioral learning goals.

c. Development

This stage includes the initial production of the learning media, focusing on transforming the planned concepts into practical implementation. The activities begin with the creation of video tutorials based on the previously designed storyboard and script, ensuring the instructional content is delivered clearly and effectively. After production, expert validation is conducted, in which the media and research instruments are reviewed by informatics teachers and digital media editors to assess accuracy, clarity, and technical quality. Based on feedback from these experts, revisions are made to improve the overall effectiveness of the media. Subsequently, limited trials are carried out in Class X RPL 1 to evaluate the practicality, clarity, and initial effectiveness of the media in a real classroom setting. Finally, to determine the impact of the media on student learning outcomes, the pretest and posttest results are analyzed using paired *t*-tests, allowing researchers to assess the statistical significance of any improvements observed.

d. Dissemination

This stage is the final phase, focusing on the dissemination of the developed learning media within a limited context. The activities include providing recommendations to teachers regarding the implementation of video tutorial media integrated with the *explicit instruction method*, aiming to enhance the effectiveness of informatics learning. In addition, a final evaluation is conducted by analyzing both the feasibility value of the media, as determined by expert assessments and the students' learning outcomes before and after using the media. This evaluation helps determine the overall impact, practicality, and potential for broader application of the developed instructional tools.

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2.2 Research Design

This study uses a *paired t-test* design, which can be explained as follows in **Equation 1** (Ardiansyah *et al*., 2023):

$$t = \frac{\overline{D}}{s_{D\,/\,\sqrt{n}}}$$

Equation 1. Paired t-test

Description:
$\overline{D}$ = average of the difference between posttest and pretest scores
s_D = standard deviation of the difference
$\sqrt{n}$ = number of students (data pairs)

2.3 Research Time

The research will be conducted in 2025. The research consists of two phases, namely the preparation phase and the implementation phase.

a. Preparation Phase

The preparation phase is the initial stage to determine the success of the research (Ardiansyah *et al*., 2023). The steps are:

1) Development of Research Instruments

This step involves designing learning evaluation questions aimed at measuring students' understanding of informatics subjects.

2) Design and Construction of Video Tutorial Media

Includes:

a) Flowchart Creation (see **Figure 1**).

This stage is carried out by depicting the process or workflow visually through a mapped sequence of steps. The flowchart below illustrates the sequential stages involved in the development of the video tutorial media, starting from the design phase to the final implementation.

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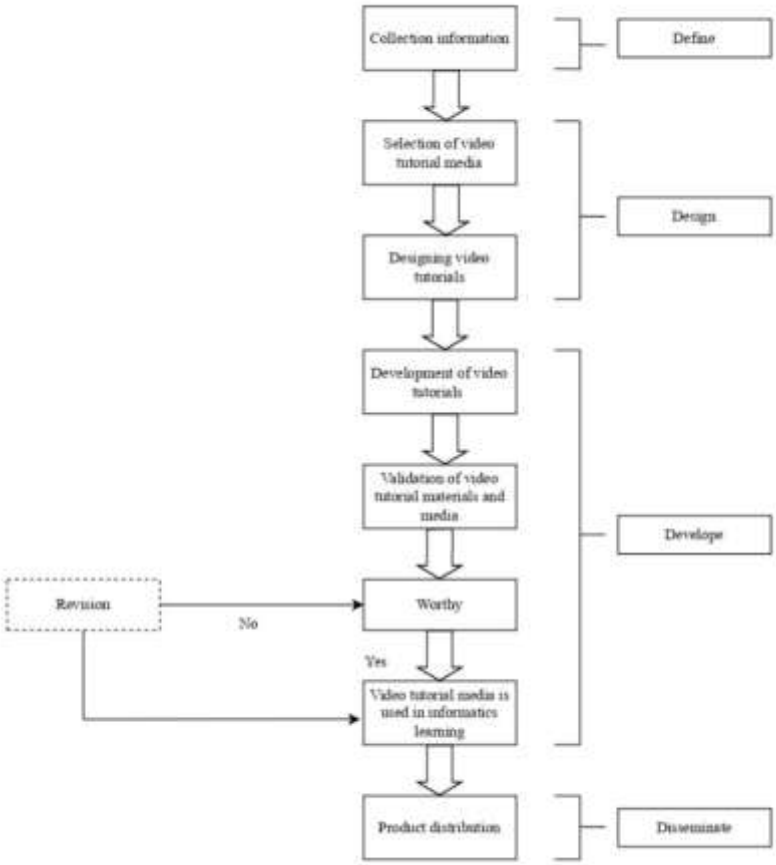

Figure 1. Flowchart

b) Storyboard Creation

The storyboard functions as a visual guide for the video flow, containing sketches of each scene and explaining how the information will be conveyed.

c) Script Writing

The script includes all the important points to be conveyed in the video.

d) Video Tutorial Creation

A video tutorial is created with a duration of approximately 10–15 minutes.

3) Research Group Preparation

This stage involves preparing the learning schedule, namely determining when the research will be conducted.

b. Implementation Phase

The implementation phase is the treatment phase (application of the *explicit instruction* method with video tutorial media). It can be described as follows:

1) Teaching Method

In this phase, the teaching of informatics materials will begin using the *explicit instruction* method supported by video tutorial media. The teaching process involves hardware, software, and brainware. The hardware includes laptops (for teachers), computers (for students), input devices (keyboards and mice), and output devices (monitors). The software used is an application. This process cannot be separated from the involvement of teachers (as facilitators) and students (as learners).

2) Observation

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During the learning process, observations will be made of class dynamics, especially focusing on how students respond to the *explicit instruction* method and their level of engagement.

3) Testing

a) In terms of functionality

This test is conducted to determine the quality of the video tutorial.

b) In terms of non-functionality

This test is used to evaluate whether the application optimizes student learning.

4) Data Analysis

Learning outcome test data and questionnaires will be analyzed to evaluate the use of the *explicit instruction* method, the video tutorial media, and validation from media experts.

5) Evaluation of Optimization of the Use of Learning Methods and Media

Based on the results of the analysis, an evaluation will be conducted to assess how optimal the *explicit instruction* method and video tutorial media are in improving learning outcomes.

2.4 Data collection instruments

Data were collected using instruments with test techniques in the form of achievement tests, which were conducted by providing questions or learning outcome assessments.

The instrument grid was created based on its analysis and functionality, referring to the category levels from Bloom's Taxonomy (Nafiati, 2021), as shown in **Table 1** below:

Table 1. Question grid

Question type	Aspect tested	Question/statement	Taxonomy category
Multiple choice	Concept understanding	Basic Microsoft Excel	Remembering
Multiple choice	Concept understanding	Excel formula	Remembering
Multiple choice	Concept understanding	Basic Excel functions	Remembering
Multiple choice	Concept understanding	Data processing in Excel	Remembering
Multiple choice	Concept understanding	Excel format and display	Applying
Multiple choice	Concept understanding	Advanced Excel functions	Applying

2.5 Validity and Reliability of the Instrument

2.5.1 Instrument Validity

Instrument validity in this study was assessed using content validity. This was done by requesting expert judgment from an informatics teacher regarding the suitability of the questions with the competencies being measured, as well as input from a digital media editor.

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2.5.2 Instrument Reliability

The paired sample *t*-test was used to determine whether there was a significant difference between the average scores before and after the treatment, compared to the expected values.

3. RESULTS AND DISCUSSION

3.1 Description of Research Results

This study aimed to design video tutorial media using the *explicit instruction* method to optimize informatics learning at SMK Muhammadiyah Kota Tasikmalaya. It employed the Research and Development (R&D) method with a one-group pretest–posttest design.

After the design phase, a pretest was administered to assess students' initial abilities before the treatment (i.e., the use of video tutorial media based on the *explicit instruction* method). The treatment was conducted over four meetings, and the process concluded with a posttest to identify the difference in learning outcomes. The results of the normality test are presented in **Table 2**.

Table 2. Normality Test

Descriptives

	Pre-test	Post-test
N	20	20
Missing	1	1
Mean	55.2	89.0
Median	56.0	90.0
Standard deviation	23.2	6.60
Minimum	16	76
Maximum	92	100
Shapiro-Wilk W	0.945	0.932
Shapiro-Wilk p	0.300	0.168

The development of the video tutorial media followed several key stages: analysis, design, development, and implementation.

In the analysis phase, the researcher identified learning problems through classroom observations and interviews with teachers. These revealed that students struggled to understand abstract material—particularly Excel—due to the lack of structured and engaging learning media. Based on these findings, learning objectives, student characteristics, and relevant competencies were determined.

In the design phase, the video tutorial was carefully planned by creating storyboards and scripts based on the *explicit instruction* model. Each instructional step—such as goal setting, demonstration, guided practice, and independent practice—was clearly structured. At the same time, research instruments including pretest and posttest questions, observation sheets, and interview guides were developed, along with a learning evaluation system based on *KTTP* (Learning Behavioral Objectives Criteria).

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During the development phase, the video tutorials were produced using screen recordings and visual annotations to illustrate the step-by-step use of Excel. Narration was added to guide students throughout the learning process. The media and instruments were then validated by informatics teachers and digital media experts. Based on their feedback, revisions were made to improve content accuracy and presentation quality.

In the implementation phase, the finalized media were applied in Class X RPL 1. The teacher used the video tutorial following the *explicit instruction* method—beginning with clear learning objectives, presenting the video as a model, guiding students through hands-on practice, and concluding with independent exercises. This process gave students the opportunity to observe, imitate, and apply what they learned, thereby strengthening their understanding.

Based on the posttest results, there was a notable increase in student scores—from an average of 55.2 to 89.0. This indicates significant improvement in students' understanding of informatics material, particularly in the use of Microsoft Excel.

A feasibility test was also conducted to evaluate the quality of the video tutorial media, as shown in **Table 3.**

Table 3. Eligibility Categories

Category	Score Percentage
85% - 100%	Very feasible
70% - 84%	Eligible
50% - 69%	Needs Improvement
<50%	Not Eligible

In this study, the video tutorial media received a total score of 24 out of 30, corresponding to an eligibility percentage of 80%. This places the media in the "Eligible" category, indicating that it meets the necessary criteria for use in the learning process. The feasibility score reflects effectiveness in terms of content accuracy, instructional design, clarity, and technical quality, making it a reliable tool to support student learning in informatics. However, its placement in the "Eligible" rather than "Very Feasible" category suggests that there is still room for improvement to enhance the media's effectiveness further.

3.2 Interpretation and Discussion of Results

The findings of this study confirm that video tutorials using the *explicit instruction* method are well-structured and focus on the demonstration of specific informatics sub-materials.

The results indicate that video tutorial media based on the *explicit instruction* method can significantly enhance students' learning in informatics subjects. This method emphasizes direct teaching with clear and structured explanations, enabling students to better grasp the basic concepts of Excel. Furthermore, the use of Excel as a learning tool provides students with practical experience, which improves their comprehension and application skills.

4. CONCLUSION

The findings of this study indicate that the video tutorial media received an eligibility score of 80% from media experts, placing it in the "Feasible" category. It can be concluded that the video tutorial media using the *explicit instruction* method is effective for teaching informatics to 10th grade students, particularly in learning Microsoft Excel.

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Students who were taught using this method showed a significant improvement in their understanding of Excel material, with pretest and posttest scores increasing from 55.2 to 89.0 after the treatment. The normality test produced a p-value greater than 0.05, indicating that the data were normally distributed. Furthermore, the hypothesis test yielded a p-value less than 0.05 (<0.001), leading to the rejection of H_0 and confirming a significant difference between the pretest and posttest results. This improvement was attributed to the implementation of the video tutorial media using the *explicit instruction* method.

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6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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