Utilization Of Smartphone As A Media For Making Educational Video About Prohibited Items At Airports To Increase Public Knowledge

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ABSTRACT

This study aims to develop an educational media in the form of a video createdusing a smartphone to enhance public awareness regarding prohibited items at airports. The background of this research is based on the importance of public understanding of baggage regulations to improve aviation safety and security. An engaging, practical, and easily accessible educational medium is needed as a more effective alternative to conventional socialization efforts.

The research method employed is Research and Development (R&D) based on the Borg and Gall model. The research procedures include identifying potentials and problems, data collection, product design, expert validation, product revision, and trial testing with respondents. The trial subjects were airport passengers selected through purposive sampling. Data collection was conducted using a one-group pretest-posttest design, and the data were analyzed using the Wilcoxon non-parametric test.

The results indicate that the educational video produced using a smartphone can significantly improve public understanding of prohibited items at airports. This is evidenced by an increase in the pretest score from 47.2% to 99.6% in the posttest, showing a 52.4% improvement. The video is considered effective, practical, and accessible, making it a compelling and efficient alternative medium for airport authorities, especially at Kalimarau Class I Airport in Berau, East Kalimantan, where the research was conducted.

Keywords : smartphone, educational video, prohibited items, airport, public knowledge.

1. INTRODUCTION

Airports are vital gateways for national and international travel, making security a top priority. A key challenge is the presence of prohibited items in passengers' luggage, which can threaten flight safety. Public awareness remains low, partly because traditional media like posters and brochures are often overlooked.

In the digital era, video content offers a more engaging and impactful way to deliver safety information, as it can combine visual, audio, and narrative elements to capture audience attention more effectively than static media. As Arsyad (2019) notes, smartphones—being accessible, versatile, and widely used—serve as highly practical tools for producing, editing, and sharing such educational materials, allowing information to reach a broader audience quickly and efficiently.

This study develops a smartphone-based educational video to improve public knowledge of prohibited items at airports, applying the Borg and Gall R&D model (Mayer, 2020) through needs analysis, product design, expert validation, and passenger field testing. The innovation lies in using low-cost technology to create engaging content that supports modern learning and enhances aviation safety awareness*.*

2. METHODOLOGY

2.1 Research Design

This research adopts a quantitative method using a pre-experimental design, which allows for the possibility that external factors may influence changes in the dependent variable, Sugiyono (2013). The overall research process is illustrated systematically in Figure 1.
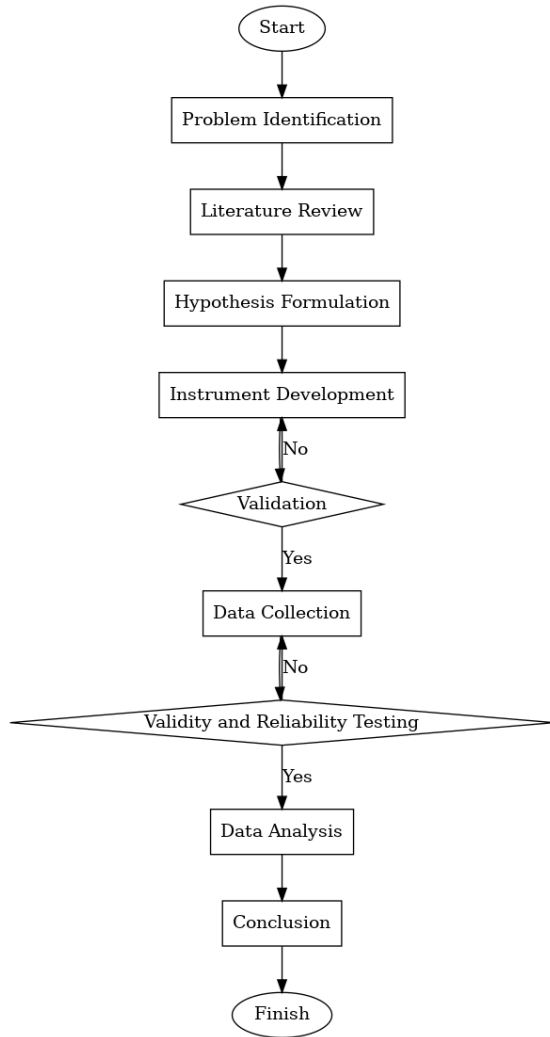
Figure 1. Research Workflow Structure

Based on Figure 1, the research process comprises the following stages:

1. **Problem Identification:** This initial stage focuses on recognizing and defining the research problem to determine the study's scope and objectives.

2. **Review of Literature:** Relevant scholarly sources are examined to establish a theoretical framework and provide clarity on the variables involved.

3. **Formulation of Hypotheses:** Drawing from prior studies and the identified problem, tentative hypotheses are formulated to be tested through empirical analysis.

4. **Instrument Development:** Questionnaires are created by converting each variable into measurable indicators.

5. **Instrument Validation:** Content is evaluated for clarity and relevance, followed by revisions until validation is achieved.

6. **Data Collection:** Validated instruments are distributed to selected respondents based on the research method.

7. **Validity & Reliability Testing:** Data is tested to ensure the instruments produce accurate and consistent results.

8. **Data Analysis:** Verified data is analyzed using suitable statistical methods.

9. **Conclusion:** Results are interpreted to address research questions and test the hypotheses.

10. **Finalization:** Marks the completion of all research activities and documentation.

2.2 Construction of Research Tools

According to Sugiyono (2013), instruments are tools used to measure social phenomena. In this study, the instrument was developed to support the creation of an educational video based on KM 39 Year 2024, focusing on public understanding of prohibited items in aviation security. A clearly defined design ensures that each stage is presented in the form of a flowchart, as shown in Figure 2 below.
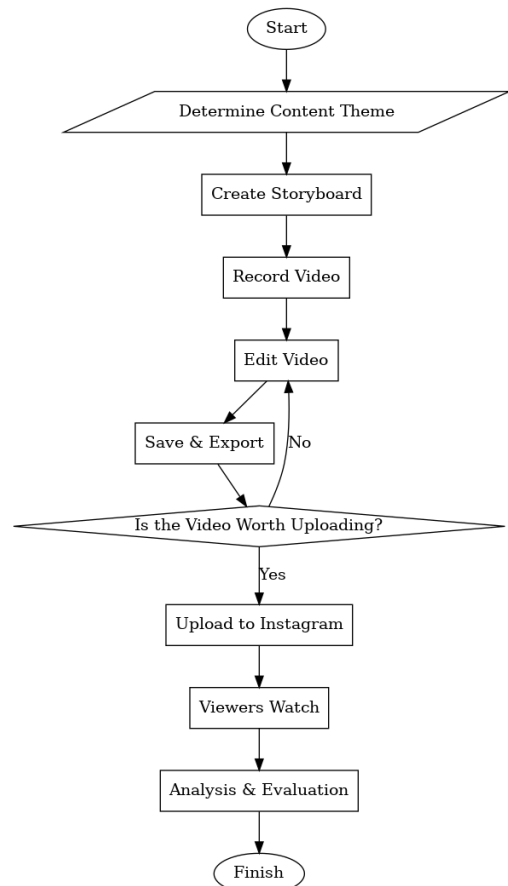

Figure 2. Construction of Research Tools

This flowchart illustrates the step-by-step process of producing an educational video using a smartphone, aimed at enhancing public awareness regarding prohibited items at airports. The stages are as follows:

1. **Start:** The process begins with the initiation of the video project.
2. **Determining Content Theme:** The theme or main message of the video is selected, aligning with the objective of educating viewers about aviation security regulations based on KM 39 Year 2024.
3. **Creating a Storyboard:** A storyboard is developed to visually plan the scenes, structure, and message flow of the video.
4. **Recording the Video:** Using a smartphone, the planned scenes are recorded based on the storyboard.
5. **Editing the Video:** The recorded footage is edited to ensure clarity, conciseness, and engagement. This includes adding text, transitions, and background music where needed.
6. **Saving and Exporting:** Once editing is completed, the video is saved and exported into a shareable format (e.g., MP4).
7. **Video Review (Validator Check):** The video is assessed to determine whether it meets quality and content standards.
    1. If the video is **not suitable**, it is revised and the editing process is repeated.
    2. If the video is **deemed appropriate**, it proceeds to the next step.
8. **Upload to Instagram:** The final video is uploaded to Instagram, chosen for its wide reach and accessibility.
9. **Audience Viewing:** The public accesses and watches the video content.
10. **Analysis and Evaluation:** Feedback and engagement metrics (e.g., views, comments) are analyzed to assess the video's impact.
11. **Completion:** The process concludes after evaluation, providing insight for future content development.

2.3 Population and sample

The study population comprises all domestic passengers departing from Kalimarau Class I Airport in Berau, East Kalimantan on January and February 2025, totaling 463 individuals. In the context of this study, the population consists of 463 individuals, based on the average number of departing passengers during operating hours (05:30 – 19:00 WITA). The sample size in this study was determined using the Taro Yamane formula (Riduwan, 2013). The sample size is calculated through interpolation as follows:

$$n = \frac{N}{N.d^2 + 1}$$
$$n = \frac{463}{463 \; x \; (0,15)^2 + 1} \quad\quad (1)$$
$$n = \frac{463}{11,41}$$

$$n \approx 40$$

Thus, the sample size used in this study is 40 respondents, representing a group deemed sufficient to provide relevant data for analysis and meet the requirements of the applied research methodology..

2.4 Instrument Testing

2.4.1 Expert Validation

Before being applied in the research process, the instruments underwent a validation stage involving experts in the fields of education, aviation security and digital media. This validation was conducted to ensure that each item within the instrument was relevant to the research topic (content relevance) and appropriately presented (presentation accuracy). The experts provided feedback on the clarity of language, the alignment of the material with the context of aviation security, and the effectiveness of the digital media format used. As a result, the instruments utilized in this study were refined to ensure the reliability and quality of the data collected.

2.4.2 Validating Testing

Arikunto (2019) defines validity as the degree to which an instrument accurately measures what it is intended to measure. High validity indicates that the data produced is accurate and reflects reality. This research applies construct validity to ensure that the instrument accurately measures passengers' understanding after watching an educational video about prohibited items at the airport, which was delivered via smartphone. The validity test was conducted using SPSS with the Pearson Product Moment correlation formula.

Each item was tested against the r-table value at a 5% significance level (df = N – 2). An item is considered valid if the calculated r-value exceeds the critical value. The validity testing was carried out prior to the main implementation of the instrument, involving a sample of 40 respondents who watched the video on different days to minimize bias.

2.4.3 Reliability Testing

Reliability refers to the consistency of an instrument when used under similar conditions (Widodo et al., 2023). In this study, the reliability of the questionnaire was assessed using the Cronbach's Alpha formula through SPSS analysis.

An instrument is considered reliable if the resulting Cronbach's Alpha value is equal to or greater than 0.60, Sujarweni (2019). This reliability test was conducted using the same group of 40 respondents as in the validity test, following their exposure to the educational video.

2.5 Data Collection

The data collection process involved the distribution of two separate questionnaires, Pretest and Posttest,

employed a one-group pretest-posttest design, in which participants first completed the pretest, then watched an educational video as the treatment, and subsequently filled out the posttest questionnaire. All responses from passengers at Kalimarau Class I Airport in Berau, East Kalimantan were successfully collected.

2.6 Data Analysis
2.6.1 Inferential Analysis

Inferential statistics refers to techniques used to analyze data obtained from a sample and draw conclusions that apply to the larger population (Sugiyono, 2013:148).

1. Normality Test: This test was carried out using the Shapiro-Wilk method through SPSS on data from 40 respondents. The data is considered to follow a normal distribution if the significance (p-value) is equal to or greater than 0.05.

2. hypothesis testing: This study uses hypothesis testing to determine the effectiveness of the educational video. Hypothesis testing was conducted using a significance level of 0.05.
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2.7 Location and Duration

The research was conducted at Kalimarau Class I Airport in Berau, East Kalimantan during the On the Job Training 1 with period from January to February 2025. But overall, The research was carried out in several phases including planning, development, data collection, and evaluation from January to the end of July 2025.

3. RESULT

3.1 Instrument Development Outcomes

Before producing the educational video, material planning was carried out based on the Minister of Transportation Decree No. 39 of 2024 on the National Aviation Security Program. The script was prepared directly on a smartphone using simple note or document apps, with simplified language for public understanding without reducing the essence of the regulations. The video presented types of prohibited items and the consequences of violations, for example, the fire risk from carrying matches onboard.

A short *reels*-style format of about one minute was chosen for its ability to deliver concise, engaging messages and reach a wide audience through platforms like Instagram. Smartphones provided flexibility in production, covering scripting, filming, and editing. Recording used the built-in camera with attention to lighting, while editing was done in InShot to cut clips,

add text, voice-over, transitions, color adjustments, and background music.

The video and pre-/post-test instruments were validated by an education expert, a senior AVSEC officer, and a media specialist, who provided feedback for refinement. The video, pre-test, and post-test were distributed to 40 respondents as the sample to determine their effectiveness in increasing public knowledge. The following is the link to the educational video created by the researcher:

https://www.instagram.com/reel/DFzGixtzzv9/?utm_source=ig_web_copy_link&igsh=MzRlODBiNWFlZA==

Field trials were then conducted with 40 passengers at Kalimarau Class I Airport in Berau using a *One Group Pretest–Posttest* design. Respondents completed a pre-test, watched the video, and then completed a post-test to measure knowledge improvement regarding prohibited items at airports.

3.2 Instrument Evaluation

3.2.1 Expert Validation

Content and media validation was conducted by two experts:

1. **Content Education Expert –** By Mrs. Dr. Laila Rochmawati, S.S., M.Pd., assessed the clarity and relevance of the questionnaire items. Her evaluation says that the instrument was deemed "usable with revision".

2. **Media Expert –** By Mr. Chaidir Adha Syah, conducted an evaluation of the digital interface and presentation of the educational video media. The results showed that the media was considered "usable" and required no revisions.

3. **Aviation Security Expert –** By Mrs. Nurhayati as an aviation security expert at Kalimarau Class I Airport in Berau, East Kalimantan, evaluated the digital interface and presentation of the educational video on prohibited items at airports. The assessment concluded that the media was "usable" and did not require any revisions.

Taking into account all evaluation results, the instrument was deemed valid and appropriate for use in the primary data collection stage.

3.3 Validity Test Results

Table 1 displays the findings of the item–total correlation analysis for every questionnaire item.

Table 1. Validity Test Results

Item No.	Corrected Item-Total Correlation (r hitung)	r tabel	Status
1	0,478	0,312	Valid
2	0,507	0,312	Valid
3	0,682	0,312	Valid
4	0,604	0,312	Valid
5	0,606	0,312	Valid
6	0,712	0,312	Valid
7	0,514	0,312	Valid

As shown in Table 1, all 20 items surpass the critical r value (0.312) at the 5% significance level with 38 degrees of freedom, demonstrating strong construct validity for both instruments.

3.4 Reliability Test Results

Cronbach's Alpha was employed to assess internal consistency, with the results summarized in Table 2.

Table 2. Reliability Test Results

Number of Items	Cronbach's Alpha Value	Information
7	0,677	Reliable

Based on Table 2, both values surpassed the 0.60 threshold, indicating that the instruments are statistically reliable and consistent for repeated application under comparable conditions.

3.5 Normality Test Results

Before conducting the hypothesis testing, a normality test was carried out to determine whether the data from both variables were normally distributed. This step is essential in selecting the appropriate statistical analysis method to ensure the accuracy and validity of the research findings.

Table 3. Normality Test Results

Test Types	Data	N	Statistic	Sig.	Info.
Shapiro-Wilk	Pretest Before watching the educational video	40	0,908	0,000	Normal
Shapiro-Wilk	Posttest After watching the educational video	40	0,147	0,000	Non-Normal

Based on Table 3, the Shapiro–Wilk normality test with a sample size of 40 respondents indicates that the data for both variables are not normally distributed (p = 0.000 < 0.05). Therefore, the hypothesis testing was conducted using the non-parametric Wilcoxon test, as it is appropriate for data that do not meet the normality assumption in this study.

3.6 Hypothesis Test Result

The results of the hypothesis testing, conducted using non-parametric test. The results summarized in this Table 4 below.

Table 3. Hypothesis Test Results

Test Types	N	Z Score	Asymp. Sig. (2-tailed)	Info.
Wilcoxon Signed Rank Test	40	-5,397	0,000	There is a significant difference.

Wilcoxon test, show that the significance value obtained is below 0.05. This indicates a statistically significant difference between the pre-test and post-test scores. These results confirm the research hypothesis that the educational video media developed using a smartphone is effective in enhancing public knowledge about prohibited items at the airport.

3.7 Strategy for Enhancing Passenger Understanding about Prohibited Items at Airports through Video Education

The strategy emphasizes the use of short, engaging, and visually appealing educational videos to effectively convey information to passengers about prohibited items. These videos are produced using smartphones to ensure cost efficiency, flexibility, and ease of production. By incorporating clear visuals, simple language, and practical examples, the videos aim to capture attention and enhance message retention. Distribution is carried out through airport display screens and social media platforms, enabling both on-site and remote audiences to access the content, thus ensuring wider reach, improved comprehension, and greater public awareness.

4. DISCUSSION

This study aimed to explore the utilization of smartphones as a medium for producing educational

videos on prohibited items at airports and to examine their effectiveness in improving public knowledge. The findings address two main research questions: how smartphones can be leveraged in creating educational media, and to what extent such media can enhance public understanding.

The results indicate that smartphones have substantial potential as production tools for educational content. They can be utilized for various stages of media creation, including scriptwriting, filming, editing, and distribution through social media platforms. Compared to conventional media such as posters or text-based materials, short videos proved to be more effective due to their engaging nature, ease of comprehension, and alignment with the information consumption patterns of the digital generation.

From a quantitative perspective, the validity test results revealed that all instrument items had significance values below 0.05, confirming their validity. The reliability test yielded a Cronbach's Alpha value of 0.677 (> 0.6), indicating that the instrument was reliable. Given the relatively small sample size of 40 respondents, the Shapiro–Wilk normality test was applied, showing that the data were not normally distributed (Sig. < 0.05). Consequently, the Wilcoxon Signed Ranks Test was used, producing a Z-value of –5.397 with a significance level of 0.000. Since the significance value was below 0.05, it was concluded that there was a statistically significant difference between pre-test and post-test scores, confirming the effectiveness of the educational video in enhancing public knowledge.

These findings indicate that public education can be carried out not only by formal institutions but also by individuals using smartphones, enabling creative information sharing that fosters participatory learning and delivers meaningful societal impact.

5. CONCLUSION

This research concludes that smartphones are highly effective tools for producing educational videos on prohibited items at airports, covering the entire production process from scriptwriting to distribution. The developed video media not only offers a practical and cost-efficient solution but also proves to be more engaging and easier to understand compared to conventional media formats.

The statistical analysis confirms that the educational video significantly improves public knowledge, as evidenced by the Wilcoxon Signed Ranks Test results showing a meaningful difference between pre-test and post-test scores. These findings highlight the potential for individuals, not just formal institutions, to play an active role in public education using simple yet powerful technology.

In broader terms, this study emphasizes the importance of leveraging accessible digital tools to disseminate critical information creatively, thereby fostering a participatory learning culture and delivering a transformative impact on society.

6. AUTHORS' CONTRIBUTIONS

This article was jointly developed through clearly defined roles and responsibilities undertaken by the author and academic supervisors. The following contributions summarize the participation of each party throughout the research and publication process:

1. Design Planning and Concept Development ation: Author 1 initiated the research idea, formulated the research questions, established the objectives, and designed both the methodology and the research instruments.

2. Data Collection and Analysis: Author 1 conducted field observations at Kalimarau Airport, distributed pre-test and post-test questionnaires, processed the data using a quantitative approach with SPSS, and interpreted the research findings.

3. Educational Media Development: Author 1 produced a short educational video on prohibited items at airports, utilizing a smartphone for scripting, filming, and editing, with content based on the Minister of Transportation Decree No. 39 of 2024.

4. Academic Supervision and Guidance: Author 2 and Author 3 scientific guidance, validated the instruments and procedures, and offered input on the structure, content, and presentation of the research.

5. Manuscript Writing and Revision: Author 1 prepared the entire manuscript, from introduction to conclusion, and revised it according to feedback from supervisors and examiners.

6. Final Approval: All authors and supervisors reviewed and approved the final version of the manuscript for publication.

This study presents a practical and innovative approach to increasing passenger awareness of aviation safety regulations through the development of smartphone-based educational video media. The structured collaboration between the author and supervisors was crucial in producing impactful findings and maintaining academic integrity throughout the research process. Furthermore, the results highlight the potential of accessible technology to effectively convey critical safety information to a wider audience.

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