

Implementation of Android-Based Hair Color Media in the Double Application Hair Coloring Instruction

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Abstract

The issue addressed in this research is the low competency of students in understanding the material of double application hair coloring, with approximately 70% of students achieving learning outcomes below the established competency standard. Therefore, a more user-friendly, engaging, and easily understandable hair color media is needed for students in its application. This study aims to: Develop Android-Based Hair Color Media as a learning tool that meets the criteria for an effective learning medium, Analyze the feasibility of the Android-Based Hair Color Media based on assessments from media and content validators, Analyze the practicality of the Android-Based Hair Color Media based on feedback from students and peers (teachers), and analyze the effectiveness of the Android-Based Hair Color Media in improving cognitive abilities. This is a development research (R&D) study. The development model used is the ADDIE model. The results show that: The design of the Android-based hair color media meets the requirements, The Android-based hair color media is feasible to be used as a learning tool, The Android-based hair color media is practical for use in teaching, and The Android-based hair color media is effective in enhancing cognitive abilities, as evidenced by the improved learning outcomes. The conclusion of this study is that the developed hair color media design meets the criteria, is feasible, practical, and effective in improving cognitive skills. The benefit of this research is that the Android-based hair color media is feasible, practical, and effective in enhancing cognitive abilities.

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INTRODUCTION

Vocational high schools, as vocational education institutions, are required to achieve student competencies in line with the demands of the workforce. The current development in education is entering an era marked by the widespread use of technological innovations in learning, which demands adjustments in the education system to align with the labor market. Riana (2020:01) explains that “the acceleration of knowledge improvement is supported by the application of learning media and digital technology, referred to as the information superhighway.” Vocational education in vocational high schools, which is oriented towards employment, aims to produce graduates who are ready for work with competencies and qualifications that are relevant to the industry and labor market. This is achieved through various strategies, such as curricula that are relevant to industry needs, internships, practical work, and cooperation with businesses and industries.

Learning media are tools used by teachers to teach concepts, patterns, and relationships between objects in learning to make them easily understood by students. According to Bambang (2024:78), “Learning media help teachers present objects well and allow students to interact more with the material, playing an important role in the teaching and learning process delivered by the teacher.” According to research by Joko Kuswanto (2020), “Learning media should be able to convey messages and stimulate the thoughts and desires of students, thereby encouraging the learning process within them.” In the learning process, a teacher is needed who can integrate information and communication technology in line with the times. Teachers are required to be more creative and innovative in selecting learning resources and teaching media that foster more active, creative, innovative, and enjoyable learning activities, thus creating multi-level interactions in the classroom.

Hair color is a chart that shows different hair color shades and has numbers or letters next to them. These numbers and letters are actually used to synchronize how the hair color looks and whether it matches the current hair color. In hair coloring, there are two main components: Level

and Tone. Hair color is a tool or chart used in the hair coloring process. In its application, students often encounter difficulties in understanding the differences between the color on the chart and the final result due to various factors, such as differences in lighting conditions, hair type, and the quality of the coloring product. Not all colors are suitable for all hair types and colors, especially for people with dark hair or specific hair textures. Some colors may not produce optimal results on dark hair or certain textures. The limited color options on the chart may also be a challenge, as some colors may not be available or difficult to find. Moreover, the results of hair coloring heavily depend on the quality of the coloring product used, as low-quality products may not provide the desired outcome.

Android-based hair color learning media is a digital visual medium that offers various functions in its usage. Its concept and design can be adapted to the needs of the users of the Android-based media. The Android-based hair color media is developed based on analysis and conditions. It is crucial to determine what learning materials need to be developed, who will use them, what resources are required, and what is already available to support the use of Android-based hair color media, as well as other factors that need consideration. Following the analysis, the design of the Android-based hair color media is developed, which is most suitable according to the data and objective information gathered from the needs and conditions analysis. Based on the design, learning materials required by students are compiled.

In the current era, most students in vocational high schools are already familiar with and proficient in using Android devices in the learning process. In fact, students are often more skilled in using these devices than their teachers. In hair coloring material, particularly in determining and enhancing the correct level according to customer desires, this requires a fundamental understanding of various factors related to color mixing. Typically, students are only provided with a catalog, and many students struggle to understand the catalog, making it necessary to have media that can support students to engage intensively and remain interested in studying this material. Therefore, it is essential to

design a learning medium that can be operated through Android, a device that students are accustomed to using daily. By using Android-based learning media, students will engage in a learning process that involves interaction with their environment, as they do in their daily life.

METODHOLOGY

Type of research

This research is classified as development research (R&D). The development model used in this study follows the ADDIE model (Analysis, Design, Development, Implementation, Evaluation) as the main stage of media development. The research procedure adopts the ADDIE development model as outlined by Dick and Carey, as explained by Fitria Hidayat and Muhamad Nizar (2021), who state that “ADDIE provides a framework for guiding the learning process from the analysis phase to the evaluation phase.”

Research instrument

This study uses assessment sheets as the data collection technique, which includes the media feasibility instrument validated by media and content validators, a questionnaire to measure the practicality of the media based on feedback from teachers and students, and a questionnaire to assess the effectiveness of the media based on student learning outcomes through pretests and posttests. The XI CA 1 class is used as the experimental group, and the XI CA 2 class serves as the control group.

Data sources and research subject

The data for this study consists of the feasibility, practicality, and effectiveness of the Android-based hair color media. The media feasibility data is measured using the media feasibility instrument from the media and content validators. The media practicality data is collected using the practicality instrument from vocational/beauty teachers and students in class XI Beauty and SPA at SMK Negeri 1 Salatiga. Meanwhile, the effectiveness data is obtained from the evaluation instrument for students in class XI Beauty and SPA at SMK Negeri 1 Salatiga.

RESULT & DISCUSSION

Results

The learning media in the form of an Android-based color chart contains hair coloring materials based on learning achievements or educational goals aligned with the applicable curriculum. The developed learning media consists of a file/application created using the Kodular application. The application includes a welcome page, a menu page containing developer profile, usage instructions, material menu, inspiration menu, simulation menu, and evaluation menu. The resolution used is a minimum of 1820 x 720 pixels, as typically used in Android applications. The size of the developed Android-based hair color media application is 5 MB.

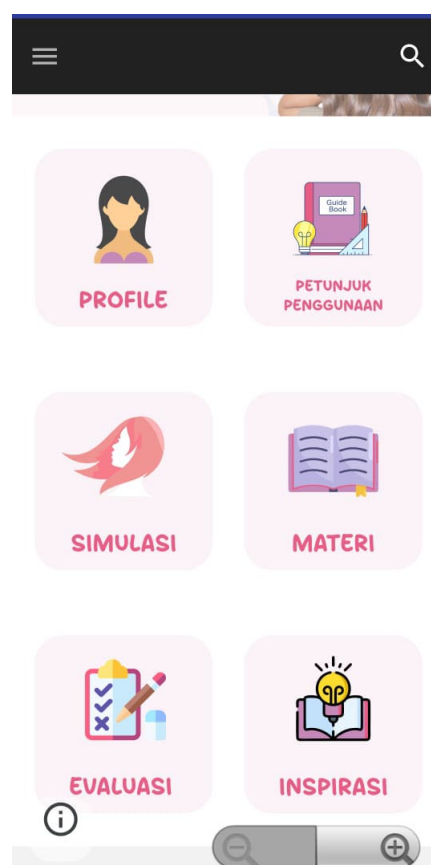


Figure 1. Media Display

The development of the Android-based hair color media has a positive impact on learning achievements. This media can increase student interest and motivation, facilitate understanding of the material, and support a more interactive

and enjoyable learning experience. In addition, the Android-based hair color media also helps teachers deliver the material effectively and efficiently.

The implementation stage involves applying the Android-based hair color media at SMK Negeri 1 Salatiga, with respondents being students of class XI Beauty and SPA 1, consisting of 34 students as the experimental group, who were provided with the Android-based hair color

media. Meanwhile, class XI Beauty and SPA 2, consisting of 34 students, served as the control group and was not given the treatment of the Android-based hair color media.

1. Pretest for the Experimental and Control Groups

The results of the two-tailed t-test using the independent sample t-test in SPSS from the performance test during the pretest are as follows,

Table 6. Group Statistics for Pretest

Group Statistics					
	Group	N	Mean	Std. Deviation	Std. Error Mean
Pretest Learning Outcome	Experimental Group	34	53.5294	11.27140	1.93303
	Control Group	34	56.0000	9.13203	1.56613

Based on Table 6, it is known that the number of respondents for both the experimental and control groups was 34 students. The average score for the experimental group was 53.53, while the control group had an average score of 56.00. The descriptive data shows a difference in learning outcomes between the experimental and control groups.

2. Conditioning

The conditioning stage in this study was carried out by conditioning the respondents after the pretest. This conditioning process involved providing the experimental group (class XI

Beauty and SPA 1) with the Android-based hair color media, while the control group (class XI Beauty and SPA 2) did not receive the treatment.

3. Posttest for the Experimental and Control Groups

The posttest for hair coloring material on the double application technique was administered to both the experimental and control groups. The experimental group was given the Android-based hair color media, while the control group used books/manuals. The results of the posttest can be seen in the following table:.

Table 7. Descriptive Statistics Results

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Posttest Experimental Group	34	72.00	96.00	85.7647	6.90656
Posttest Control Group	34	52.00	80.00	69.5294	6.75204
Valid N (listwise)	34				

Based on Table 7, the average posttest score for the experimental group was 85.76, while the control group had an average of 69.53. The minimum and maximum scores for the experimental group were 72.00 and 96.00, respectively, while the control group had scores ranging from 52.00 to 80.00. This shows a clear difference in learning outcomes between the experimental and control groups. To determine the significance level between these groups, the

posttest data will be analyzed using an independent sample t-test.

4. Normality Test

The posttest data for both the experimental and control groups underwent a normality test to check if the data distribution is normal. The hypothesis for the normality test is that if the p-value (sig.) > 0.05, the data is considered normally distributed. The Kolmogorov-Smirnov test results for the posttest learning outcomes of both groups are shown in the table below,

Table 8. Normality Test Results for Posttest

		Tests of Normality					
		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Posttest	Experimental Group	0.130	34	0.154	0.938	34	0.053
Learning	Class Group	0.147	34	0.062	0.039	34	0.057
Outcome							
Lilliefors Significance Correction							

Based on Table 8, the Kolmogorov-Smirnov normality test for the posttest learning outcomes in the experimental group showed a statistic value of 0.130 and a sig. value of 0.154 > 0.05. For the control group, the statistic value was 0.147 with a sig. value of 0.062 > 0.05. Since both sig. values are greater than 0.05, it can be concluded that the learning outcomes of both groups are normally distributed.

5. Homogeneity Test

Table 9. Homogeneity Test Results for Posttest

		Test of Homogeneity of Variance			
		Levene Statistic	df1	df2	Sig.
Posttest	Based on Mean	0.000	1	66	0.988
Learning	Based on Median	0.000	1	66	1.000
Outcome	Based on Median and with adjusted df	0.000	1	65.570	1.000
	Based on trimmed mean	0.000	1	66	0.989

Based on Table 9, the Levene's Test for homogeneity for the posttest results shows a Levene Statistic of 0.000 with a sig. value of 0.988. Since 0.988 > 0.05, it can be concluded that the data for both the experimental and control groups are homogeneous.

6. Cognitive Improvement Test using t-test

This test was conducted to determine the difference in the outcomes between the experimental and control groups. In this

The homogeneity test used the Levene's Test for Equality of Variances to assess the cognitive abilities of the experimental and control groups in the posttest. The significance level used for this homogeneity test was 0.05. The criteria for the test are: if the sig. value \geq 0.05, the data is homogeneous; if the sig. value \leq 0.05, the data is not homogeneous. The results of the Levene's Test are presented in the table below.

independent sample t-test, the alternative hypothesis (H_a) is accepted if the t-value > t-table (95%), meaning the Android-based hair color media is effective in improving the cognitive abilities of students in hair coloring techniques. The null hypothesis (H_o) is rejected if the t-value < t-table (95%).

The independent sample t-test was calculated using SPSS, with the results presented in the table below,

Table 10. t-Test Results

		Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Posttest Learning Outcomes	Equal variances assumed	0.000	0.988	9.801	66	0.000	16.235	1.656	12.928	19.543
	Equal variances not assumed			9.801	65.966	0.000	16.235	1.656	12.928	19.543

Based on Table 10, the calculated t-value is 9.801. Given that the t-table value is 1.670 with $df = 66$ and a significance level of 0.05, the calculated t-value ($9.801 > 1.670$), meaning the null hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted. This suggests that the Android-based hair color media is effective in improving cognitive of student abilities in hair coloring techniques.

7. Cognitive Improvement using N-Gain Test

N-Gain was calculated by comparing the pretest and posttest scores. The average N-Gain score for the experimental group was 0.70, classified as high, with a minimum value of 0.38 and a maximum value of 0.92. The N-Gain score for the control group was 0.30, classified as moderate, with a minimum value of 0.14 and a maximum value of 0.46.

8. Effectiveness of the Android-Based Hair Color Media in Teaching Hair Coloring Techniques.

The effectiveness of the developed Android-based hair color media was measured using a posttest instrument. Before administering the posttest, the researcher consulted the test instrument with the supervisor and the hair coloring teacher to ensure it aligned with the learning goals. The test consisted of 25 multiple-choice questions. The posttest results are shown in the table below,

Table 11. Posttest Results

No.	Description	Posttest result
1.	Highest score	96
2.	Lowest score	72
3.	Average score	85.76
4.	Minimum Mastery Score	78
5.	Total students	34
6.	Students Achieving Mastery	30
7.	Students Not Achieving Mastery	4
8.	Percentage of Students Achieving Mastery	88.24%

Based on Table 11, the posttest results for hair coloring techniques in the double application category show that 88.24% of students achieved mastery, indicating a very high cognitive ability. This suggests that the developed Android-based hair color media is effective.

9. Evaluation of the Development of Android-Based Hair Color Media in Teaching Hair Coloring Techniques

The evaluation of the Android-based hair color media in teaching the double application hair coloring technique showed significant impact on student learning outcomes. The evaluation process was thorough, with input and revisions from the researcher and supervisor to ensure the media's quality and effectiveness. After implementation in the experimental class at SMK Negeri 1 Salatiga, the evaluation showed excellent results. The average student learning outcome was 85.76, significantly above the minimum competency standard. Furthermore, the learning mastery achievement reached 88.24%, meaning more students met the expected standard. This indicates that the Android-based hair color media not only effectively improved students' cognitive skills but also encouraged them to achieve the desired learning outcomes. The media proved to be a clear and interactive guide, helping students understand complex concepts and engage actively in the learning process. The evaluation showed that the media enhanced the overall learning experience, making it more engaging, effective, and efficient.

Discussion

The design of the Android-based hair color media for teaching the double application hair coloring technique has met the requirements, after first creating the flowchart and storyboard. The design, flowchart, storyboard, and media development were guided by the supervising lecturer. This Android-based hair color media meets the criteria as a learning tool, in line with the research by Dian Pramana Putra (2021), which states that the developed media aligns with the learning objectives, is up-to-date, and is systematically organized.

The results of the CVR, CVI, and Percentage of Agreement from media validators gave a CVR value ranging from 0.33 to 1, and a CVI value of 1.00. The Percentage of Agreement value was 100%, which is higher than the 80% agreement threshold, indicating that the media validation instrument is valid and reliable. Based on the CVR and CVI analysis, the feasibility of the media suggests that the Android-based hair

color media for teaching the double application hair coloring technique is “Very Feasible” and ready for implementation, which involves a limited trial.

The media’s feasibility, based on the assessment by validators on various aspects, consists of 20 indicators. These indicators assess the general quality, software engineering, and visual communication of the developed Android-based hair color media. The selection and determination of quality in these aspects—general quality, software engineering, and visual communication—were the focus of the media validation process. This aligns with the statement by Lilis Diah et al. (2021) that the utilization of media to combine text, graphics, audio, moving images (video and animation), and appropriate links and tools enables users to navigate, interact, create, and communicate effectively.

Following the validation tests, the conclusion is that the Android-based hair color media is a finished product and highly feasible for students to use to improve their cognitive abilities in hair coloring techniques. The “very feasible” rating for this media was derived from the validation results from five media validators and five content validators. The validity test scores from the media validators showed an overall score of 4.73 for the general aspect, with a rating of “very feasible,” 4.64 for the software engineering aspect (also “very feasible”), and 4.6 for the visual communication aspect (“very feasible”). After averaging all the aspects and validators, the media validation score was 4.59, categorized as “very feasible.”

The effectiveness of the Android-based hair color media was tested using the Independent Sample t-test. The learning outcomes were analyzed, and the t-test results showed a calculated t-value of 9.801 with a sig. (2-tailed) value of $0.000 < 0.05$. Since the calculated t-value (9.801) is greater than the t-table value (1.670), it can be concluded that there is a significant difference in the average learning outcomes between the experimental and control groups. This indicates that the use of Android-based hair color media significantly improves cognitive abilities. The N-Gain score of 0.70 indicates a high level of improvement in learning outcomes for the experimental group compared to the

control group, which used manual books. The N-Gain score was then compared to the N-Gain Score categories (g), where a g value > 0.7 indicates a high category improvement.

Based on the evaluation results of the Android-based hair color media for the double application hair coloring technique, several important aspects showed significant improvement. First, the learning outcomes showed significant improvement, as evidenced by the t-test results indicating a significant difference between the experimental and control groups. Second, the mastery of the material by students in the experimental group, using the Android-based hair color media, increased with an N-Gain value of 0.70, categorized as high. Third, involvement and motivation also showed improvement, as indicated by the positive responses from students in the practicality survey. Fourth, the efficiency of the learning process also improved, as the Android-based hair color media enabled the presentation of more engaging and easily understandable content, which accelerated understanding of the taught material.

All of these results align with previous studies that have indicated that Android-based hair color media is effective in improving learning outcomes, comprehension, and student engagement at SMK Negeri 1 Salatiga. The effectiveness of the Android-based hair color media in improving learning outcomes is consistent with the opinion of Anggie Bagoes (2021), who states that the effectiveness of a learning media tool is measured by how well it helps achieve the learning objectives.

The developed Android-based hair color media was also categorized as practical after analysis using the reproducibility coefficient and scalability coefficient. The reproducibility coefficient (K_r) for students was 1.00 and for teachers was 0.97, while the scalability coefficient (K_s) for students was 1.00 and for teachers was 0.93. These values are considered practical based on the established criteria, where $K_r > 0.90$ and $K_s > 0.6$.

The research results on the practicality of the Android-based hair color media for the double application hair coloring technique indicate that the media is very effective in guiding students through the learning process. Feedback from 34

students in class XI Beauty and SPA and 10 Beauty teachers, measured through a questionnaire, showed very high positive responses. The percentage of practical media responses from students was 100%, and from teachers, it was 97%, both categorized as “very practical.” This indicates that the Android-based hair color media is not only easy to use but also provides clear and efficient guidance to students in learning complex material.

CONCLUSION

The Android-based hair color media, which has been validated by media experts, content experts, and users (teachers and students), will be revised based on the feedback and suggestions received. The development of the Android-based hair color media used the ADDIE model for the hair coloring material in the double application technique for students in the Beauty and Spa program at SMK Negeri 1 Salatiga. Based on the results from media validators, an average score of 100% was obtained, indicating that the media is categorized as highly valid. The validation results from content experts showed an average score of 90%, placing it in the category of highly valid learning media. The results from user trials (teachers) showed an average score of 97%, categorizing the media as highly practical. Additionally, the user trials (students) showed an average score of 100%, confirming that the Android-based hair color media is both practical and engaging.

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