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# DEVELOPMENT OF BAMBOOZLE INTERACTIVE LEARNING MEDIA ON OFFICE TECHNOLOGY EQUIPMENT AND APPLICATION ELEMENTS

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**Abstract:** This study aims to develop Bamboozle-based interactive learning media for the subject of Information Technology, specifically Office Technology Equipment and Applications, in class X MPLB 3 at SMKN 10 Surabaya. The background of this study is based on the low utilization of learning media, which is still limited due to the dominant use of whiteboards with markers, as well as the fact that student learning outcomes have not yet reached the minimum competency standard (KKM). The method used was research and development (R&D) with a modified ADDIE model, which included the stages of analyze, design, development, and implementation. The resulting media product was an interactive quiz with features such as material, instructions for use, and practice questions based on the Bamboozle application. The results of validation by subject matter experts obtained a percentage of 96% to 98% in the "very feasible" category. Limited trials were conducted on 20 students in terms of response, reaction, and confidence, with a percentage score above 98% with the criteria "very feasible". Students rated this media as visually appealing, relevant to learning needs, and capable of increasing motivation and learning engagement. Thus, the Bamboozle interactive learning media is suitable for use as a learning support tool to improve material comprehension, learning enthusiasm, and create a more active and enjoyable classroom atmosphere.

**Keywords:** ADDIE, Bamboozle, Interactive learning media.

## INTRODUCTION

The 5.0 technology era has a close relationship with humans because technology was created to make life easier and help solve various social problems both in the digital world and in the real world. (Wijaya & Wibawa, 2022). Currently, technology has also brought significant changes in increasing productivity because it can help humans solve problems more easily (Miasari dkk, 2022). The use of technology has also expanded into various fields, one of which is education. According to Permana, Hazizah, & Herlambang (2024) Technology is often used in education as a supporting tool to make the learning process more effective. Furthermore, the use of technology in learning can also influence the strategies and learning styles that can be applied (Salsabila dkk, 2024).

The use of technology in education can help advance education in Indonesia and make it more creative, such as through the use of digital or electronic learning media that can serve as learning support tools (Purba & Saragih, 2023). Learning media is an integral part of the overall learning system, which can determine the learning process itself (Daniyati dkk, 2023). According to Wulandari dkk (2023) teachers typically employ learning media as a variation throughout the learning process and as an intermediate in providing content to pupils. One of them is by using interactive learning media that can make it easier for students to understand learning materials because it involves various things such as interaction with others, learning information through videos, images, or audio (Muflikhah & Qona'ah, 2024). Interactive learning media is a tool designed to support the learning process by involving visual, audio, and kinesthetic elements. Interactive learning can take the form of educational applications, interactive learning videos, educational games, or other learning aids that make learning more interesting (Ali dkk, 2025).

Over the past few years, the use of learning media utilizing various technologies has often been employed because it can attract the interest of students during the learning process (Darmawan & Aghni, 2024). There are several interactive media that can be applied during the learning process, one of which is Bamboozle, a web-based learning media designed to be attractive for use as interactive learning media (Tsurayya & Sukmawati, 2023). Winaningsih, Syarif, & Pahrurroji (2022) explains that utilizing interactive media such as bamboozle can improve learning outcomes and student interest, because easy access to the bamboozle application on mobile devices is one of the keys to more effective learning. The bamboozle application is typically used to create group or individual quizzes to measure student understanding during the learning process (Zulbani & Syafryadin, 2025).

According to Salsanila & Faisal (2025) research, using interactive learning tools like bamboozle can boost students' engagement, excitement, and positive reaction to learning. According to research by Wardani & Kiptiyah (2024) the creation of quiz-based learning materials with Bamboozle can enhance student learning outcomes by raising average results following the use of bamboozle media. Additionally, research on the interactive media bamboozle and its impact on learning outcomes was done by Chamelia, Murjainah, & Oktavia (2025) The results demonstrated that bamboozle may make learning more fun and greatly enhance comprehension of the subject matter. According to by Lestari, Hidayani, & Oktaviana (2024) bamboozle media is highly beneficial for learning since it helps foster healthy peer interactions in addition to enhancing comprehension of the subject matter. Verawati, Mastur, & Sufyadi (2024) It also found that using quiz apps like bamboozle fosters a cooperative and healthily competitive learning atmosphere in addition to assisting teachers in rapidly evaluating students' comprehension.

This research focuses on the Office Management and Business Services (MPLB) study program, specifically for class X MPLB 3 elements of office technology equipment and its applications, specifically on the material of office equipment, procedures for using office equipment, and maintenance of office equipment. Based on the results of interviews with teachers and students a gap was found between ideal learning conditions and practices that occur in the field. Ideally, learning should utilize interactive learning media that can increase student engagement and understanding of the material (Faturrokhman, 2024). However, the learning process is still dominated by conventional methods using whiteboards and markers without adequate interactive media support. As a result, students become less engaged and learning feels monotonous. This is evident in the suboptimal learning outcomes, as evidenced by the average daily test score for class X MPLB 3 which reached 71.7 out of a minimum completion criterion of 78.

Based on the above description, learning media is needed to support learning so that it is more effective and interesting, enabling students to understand the learning material optimally. The development of interactive learning media such as bamboozle is also in line with the direction of the independent curriculum at the Vocational High School (SMK) level, which emphasizes project-based learning and interactive activities to strengthen student competencies in accordance with learning outcomes in the Office Technology Equipment and Applications element. Considering this phenomenon, the researcher was interested in conducting research entitled Development of bamboozle Interactive Learning Media on Office Equipment and Technology Applications for Grade X Students at SMKN 10 Surabaya. In addition to analyzing students' reactions to the use of interactive learning media to support the efficacy and appeal of the learning process, this study aims to ascertain the viability of the media created based on assessments by subject matter experts, media experts, and limited trials. This bamboozle learning resource is intended to aid in the process of learning.

## RESEARCH METHODOLOGY

This research applies a research and development (R&D) approach using the ADDIE model. According Sugiono (2023) defines research and development procedures as strategies that seek to create a product and assess its efficacy. According to Cahyadi (2019) The ADDIE model is a systematic approach that divides the learning planning process into several steps to organize them into a logical sequence, then uses the output from each step as input for the next step. The ADDIE model consists of five stages, namely analyze, design, development, implementation, and evaluation. Nevertheless this study only included four of the ADDIE model's components which are as follows: 1) analyze, which examines the requirements and issues that arise during the learning process; 2) design, which involves creating media that aligns with the learning objectives; 3) development, which involves creating products based on the designs created; and 4) implementation, which involves using the media for educational purposes. The evaluation stage was not carried out due to time and scope limitations in this research.

This development study utilizes the *bamboozle* application as an interactive learning medium in computer science, specifically in the elements of office technology equipment and applications. The test subjects in this study were students in class X MPK 3 at SMK Negeri 10 Surabaya. According to Sadiman (2014) To represent the target population, a sample of 10-20 students was required for a limited trial. Therefore, the researcher conducted a limited

trial on 20 students who were selected at random. The purpose of this limited trial was to determine student response to the use of *bamboozle* interactive learning media and to identify differences that occurred during the learning process after using *bamboozle* interactive learning media. (Khoirunnisa, dkk, 2020). Validation sheets and student response surveys are among the data gathering tools utilized. The validity of the Bamboozle interactive learning media product will be evaluated by material and media specialists using these validation sheets. While media experts will assess the visual elements, utilization, advantages, and design of the learning media created, subject matter experts will assess the questions' presentation, utility, and fit to the learning objectives. The efficacy of the educational materials that students have been exposed to during the learning process will be assessed using the student response questionnaire. The student response surveys and validity assessment criteria are as follows.

**Tabel 1. Assessment Criteria for Material Experts and Media Experts Validation Sheets**

Kriteria	Skor
Very good	5
Good	4
Currently	3
Bad	2
Very bad	1

Sumber : Riduwan, (2013)

**Tabel 2. Student Response Assessment Criteria**

Information	Score
Yes (Y)	1
No (T)	0

Source: (Riduwan, 2013)

After obtaining data from subject matter and media experts, data was analyzed in percentage form using the following formula:

$$Persentase = \frac{\text{Total validation score}}{\text{Maximum score}} \times 100\%$$

Source: (Riduwan, 2013)

After the data from the students' responses was obtained, data was analyzed in percentage form using the following formula:

$$Persentase = \frac{\text{Total validation score}}{\text{Maximum score}} \times 100\%$$

Source: (Riduwan, 2013)

The validation procedure involves several stages. First, the developed product is submitted to subject matter and media experts for assessment based on the developed validation instrument. Then, researchers hold direct discussions with the experts to obtain input and suggestions for improvement. After the revision process is complete, the product is retested on a limited basis to ensure its suitability for learning. The analysis calculation will obtain a feasibility percentage in accordance with the criteria for interpreting the validation score and student responses, which can be observed in the results below.

**Tabel 3. Criteria for Interpreting Expert Validation Scores Material Experts, Media Experts, Student Responses**

Persentase	Criteria
0 % - 20 %	Not feasible

21 % - 40 %	Less than worthy
41 % - 60 %	Quite worthy
61 % - 80 %	Worthy
81 % - 100%	Very worthy

Source: (Riduwan, 2013)

Based on these interpretation criteria, the interactive bamboozle learning media developed by researchers is considered feasible if it obtains a percentage of  $\geq 61\%$  with strong or very strong criteria.

## RESULTS AND DISCUSSION

### The process of development of bamboozle interactive learning media on office technology equipment and application elements

The process of developing the Baamboozle interactive learning media for the Office Equipment and Technology Applications subject at SMK Negeri 10 Surabaya was carried out through several stages using the ADDIE model, which includes the analysis, design, development, implementation, and evaluation stages. However, the researcher only used four steps, namely analyze, design, development, and implementation, due to limitations in the research.

The first stage is the analysis stage, which involves identifying learning needs, student characteristics, learning objectives, and problems that arise. In this process, the researcher analyzed the characteristics of students in class X MPK 3 at SMK Negeri 10 Surabaya and determined the learning media needs. Through observation and interviews with teachers and students, several problems were identified, one of which was the limited learning media used because learning was still dominated using whiteboards with markers, resulting in a lack of understanding of the learning material and a lack of enthusiasm among students during the learning process.

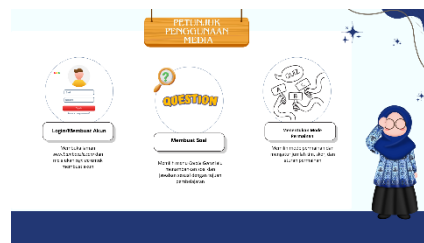
The second stage is the design stage, which aims to ensure learning readiness and determine the appropriate evaluation methods. In this design stage, researchers are required to devise solutions to problems that can address deficiencies in the learning process. This process is carried out systematically through several stages, starting from determining the learning material, designing the display, to selecting interactive features that support the learning process. This design stage is carried out to produce learning media that is not only visually appealing but also relevant, easily accessible, and can help students achieve optimal learning outcomes.

The process of developing and perfecting the product is referred to as the third stage. At this point, the planned educational materials are transformed into a finished product that is prepared for testing. Experts in media and materials verify the product before usage to guarantee its quality. Language, format, and content correctness are all evaluated by the subject matter experts. Aspects like simplicity, integration, focus, balance, shape, and color are all included in the media experts' evaluation. The Bamboozle learning medium, which is used to learn about office technology tools and applications, is the product created in this study. The media display consists of a cover page, a media usage instructions page, a menu page containing four options, namely: 1) information about the Bamboozle application, 2) information about learning objectives, 3) information about game instructions, 4) information about learning materials, and finally, a login page for the Bamboozle learning media. The following is the interactive learning media that has been developed in this study:

1)



2)



3)

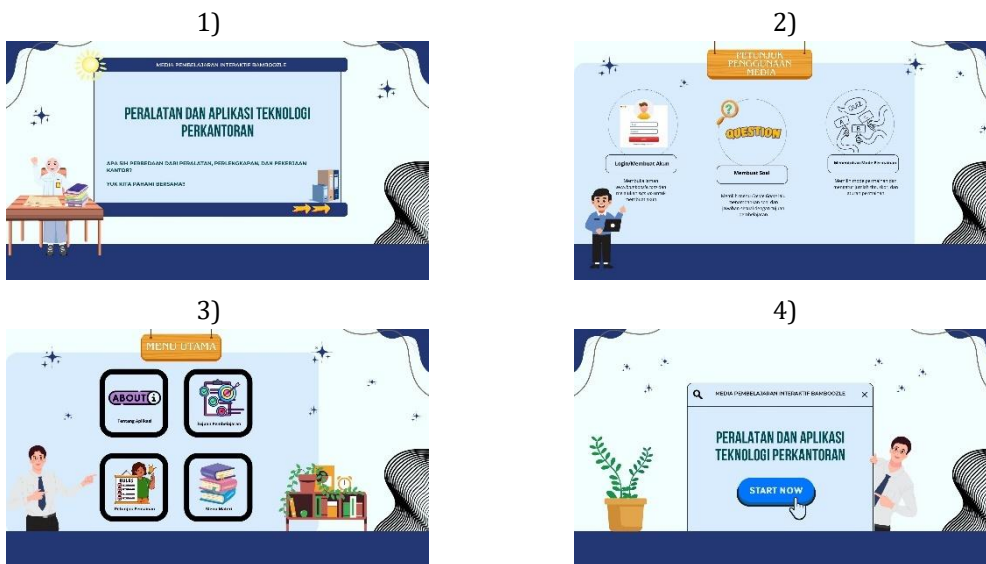


4)



**Figure 1. bamboozle interactive learning media display:**  
 1) Cover display, 2) Media usage instructions, 3) Main menu, 4) Login page

After the learning media was developed, the next step was validation by subject matter and media experts. There were several improvements that needed to be made by the researcher, namely the lack of variety in the media developed and the lack of color gradation. The following is the Bamboozle interactive learning media that has been revised by the researcher based on reviews from media experts regarding the appearance of the Bamboozle interactive learning media:



**Figure 2. Display of revised media results:**  
 1) Cover display, 2) Media usage instructions, 3) Main menu, 4) Login page

The fourth stage is the implementation stage, which involves implementing the interactive bamboozle learning media that has been developed for the test subjects, namely 10th grade MPLB 3 students and teachers of office equipment and technology applications. This implementation stage was carried out by providing instructions on the use of learning media by giving tutorials on the use of Bamboozle interactive learning media to teachers and students so that it could be used in learning office equipment and technology applications.

**The suitability of bamboozle interactive learning media on office technology equipment and application elements**

Through a validation procedure conducted by many specialists, the applicability of learning media may be ascertained. This method aims to assess the degree to which the created media can be implemented in the teaching and learning process and in line with learning needs. Material expert validation and media expert validation make up this validation procedure. Material expert validators consist of lecturers from Surabaya State University and teachers from SMK Negeri 10 Surabaya who teach elements of office technology equipment and applications. Media expert validators consist of teachers from SMK Negeri 10 Surabaya who teach informatics and visual communication design (dkv). After the validation test by material and media expert validators, researchers will make improvements according to the experts' opinions. The outcomes of the validation conducted by material expert validators are listed below.

**Tabel 4. Results from subject matter experts**

Validator	Persentase	Criteria
Ahli Materi I	96%	Very strong
Ahli Materi II	96%	Very strong

Ahli Media I	98%	Very strong
Ahli Media II	96%	Very strong

Compiled by researchers (2025)

Based on the results obtained from the validation of subject matter experts and media experts, the feasibility percentage was 96% from subject matter validators I and II, and 98% from media expert validator I and 96% from media expert validator II. If interpreted, all aspects of the assessment can be categorized as very feasible, as stated by Riduwan, (2013) If the results obtained are between 81-100%, then it can be said to be very feasible. Therefore, it can be concluded that bamboozle interactive learning media for office equipment and technology applications is very feasible to use as a supporting tool in the teaching and learning process.

The interactive learning media developed has been proven to be effective in improving the quality of learning. According to Vriyanti, Wijaya, & Menrisal, (2023) The availability of interactive learning media can provide new educational information for teachers in providing interesting learning methods and developing their technological skills. In addition, it can also make students active and interested during learning. This is proven by research conducted by Rosa, Suastra, & Sariyasa (2023) stated that interactive learning media is very valid and suitable for use in learning activities because there was an increase in student learning outcomes, with an average pretest score of 61.16 and a posttest score of 90.66. In addition, research conducted by Putri & Puspasari (2023) also showed that interactive media in supporting learning can improve the quality of learning, including student engagement and the effectiveness of material delivery, as evidenced by the scores given by subject matter experts and media experts, with an average of 97.89%.

### Students' response to the development of bamboozle interactive learning media on office technology equipment and application elements

The researchers conducted a limited trial on 20 randomly selected students in class X MPLB 3 to measure student responses to the use of bamboozle interactive learning media. Student responses were demonstrated in their reactions, responses, and confidence levels. Students will respond positively to something if they find it interesting, and conversely, they will respond negatively if they find it uninteresting (Faryanti, 2016). The following are the results of student responses to the development of bamboozle interactive media:

**Tabel 5. Student Response Sheet Results**

Aspect	Persentase	Criteria
Response	98,1%	Very strong
Reaction	98,3	Very strong
Self-confident	100%	Very strong

Compiled by researchers (2025)

Based on limited trials conducted on 20 students in class X MPLB 3, it was found that the bamboozle interactive learning media received a very positive response from students. This can be seen from the aspects of response, reaction, and confidence, all of which obtained a percentage above 98% with very feasible criteria. The response aspect obtained a percentage of 98.1%, indicating that students considered the bamboozle interactive media to be interesting, easy to understand, and enjoyable when used in the learning process. Meanwhile, the reaction aspect obtained a percentage of 98.3%, which shows that students were enthusiastic, active, and directly involved during the learning process while using this bamboozle media. The confidence aspect reached 100%, which proves that the use of bamboozle media can foster students' courage to answer questions, express opinions, and reduce feelings of doubt or fear of making mistakes in learning.

Additionally, pre-test and post-test analyses were carried out on a small sample of students in order to bolster the efficacy of the created interactive learning media bamboozle. The average student pre-test score of 72.1 increased to 89.3 in the post-test, indicating a substantial improvement in student learning outcomes following the use of bamboozle-based media. Bamboozle was deemed preferable based on student replies because it provides flexibility in question kinds, facilitates team-based learning, and promotes direct communication in the classroom. In contrast to Quizizz and Wordwall which focus more on individual quizzes, bamboozle emphasizes peer interaction through group competitions and direct feedback.

According to Ghofur & Youhanita (2020) interactive learning media can increase student motivation and engagement during the learning process. Students' enthusiastic feedback that bamboozle media not only provides knowledge but also helps students develop their abilities through relevant interactive tasks is proof of this. In addition, according to Rosanti & Puspasari (2022) The development of learning media can be used by students as a

learning resource, as evidenced by the 96.5% response rate from students, which means that interactive learning media is very attractive to use in the learning process. This is in line with research conducted by Inawati & Puspasari (2020) which found that interactive learning media may be utilized in the classroom to deliver instructional instructions or information. Overall, the study's findings show that bamboozle interactive learning materials are appropriate for use in educational activities because a high proportion of students' positive responses demonstrate the media's efficacy in boosting motivation, assisting students in understanding the subject matter, and fostering a more stimulating learning environment. Thus, the creation of interactive media like Bamboozle might be an alternative innovation that promotes contemporary education that prioritizes student engagement and a pleasurable learning experience.

## CONCLUSION

The Bamboozle interactive learning media for the Informatics subject, specifically the Office Technology Equipment and Applications element for grade X MPLB 3 at SMKN 10 Surabaya, can be used as a learning support tool, according to the research findings. The results of subject matter expert validation, which yielded a percentage of 96%, and media expert validation, which yielded a percentage of 98% with a category of highly feasible, demonstrate that this media is deemed appropriate for learning needs with regard to both media display and content. In addition, a limited trial conducted on 20 students showed a very positive response with a response rate of 98.1%, a reaction rate of 98.3%, and a confidence rate of 100%. These findings demonstrate that using Bamboozle media may improve students' comprehension of the subject matter, boost their drive to study, boost their self-esteem, and provide a more engaging, dynamic, and joyful learning environment. As a consequence, the research goals of evaluating the media's appropriateness and examining students' reactions to using Bamboozle interactive learning materials have been accomplished with outstanding outcomes.

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