



Development of Learning Media Based on Interactive Presentation Using Ahaslides Software on Choux Paste Material at Telkom Tourism Vocational School

Muhammad Resnu Wildan Imani*, Atat Siti Nurani, Sri Subekti

Program Studi Pendidikan Tata Boga, Fakultas Pendidikan Teknologi dan Kejuruan

Universitas Pendidikan Indonesia

Correspondence: E-mail: resnuimani@student.upi.edu

ABSTRACTS

In learning choux paste in class xi-tb 4 at Telkom Bandung Tourism Vocational School, it was found that 77% of students did not understand the choux paste material. Students must understand the theory of making choux paste because in practice it is quite difficult to make. This has become the author's attention to developing interactive presentation-based learning media using AhaSlides software on choux paste material at Telkom Bandung Tourism Vocational School. The research objectives are (1) planning the development of interactive presentation-based learning media using AhaSlides software, (2) creating interactive presentation-based learning media using AhaSlides software, (3) carrying out validation tests on interactive presentation-based learning media using AhaSlides software. This research uses the first level Research and Development (R&D) method, with a descriptive qualitative approach. The research results stated that (1) planning the development of interactive presentation-based learning media using AhaSlides software, with stages of finding potential problems, literature study, product design. (2) create interactive presentation-based learning media with the stages of creating an account on the Ahaslides software, creating files on the AhaSlides software, creating interactive presentations. (3) Carrying out validation tests on material, language and media, with a statement that they are suitable for use.

ARTICLE INFO

Article History:

Received 02 Feb 2023

Revised 10 Mei 2023

Accepted 18 Aug 2023

Available online 01 Nov 2023

Keyword:

AhaSlides,

Choux Paste,

Interactive Learning Media

1. INTRODUCTION

Choux pastry is a classic product in continental cuisine that is typically served as a dessert, though it may also appear as an appetizer. Understanding the theoretical foundation behind choux pastry preparation is essential for vocational students, particularly because of the challenges involved in its practical execution. Field teaching experience (PPL) and unstructured interviews indicate that approximately 77% of students lack a proper understanding of choux pastry preparation techniques. This difficulty is further compounded by the teacher's reliance on traditional, non-interactive teaching methods, such as PowerPoint slides and whiteboard explanations. These findings suggest the urgent need for a more engaging and interactive approach to instruction—especially in complex culinary subjects (Putra et al., 2021; Salamah & Fitria, 2023; Wijaya & Gunawan, 2022; Lin et al., 2020).

Interactive learning media are essential in addressing student comprehension difficulties, especially in technical subjects like choux pastry. Platforms such as AhaSlides foster two-way communication between teachers and learners, facilitating real-time feedback, discussion, and active participation. According to Hurd and Jennings (2009), interactive presentation media are effective in promoting understanding, skill development, and motivation. More recent studies confirm that interactive digital tools improve learner focus and enhance classroom dynamics, particularly when applied in vocational contexts where demonstration and feedback are crucial (Ismail et al., 2022; Kurniawati & Susanti, 2023; Ozturk et al., 2020; Zhang & Zhu, 2021).

AhaSlides is a web-based software that allows real-time interaction, where students can respond instantly via their mobile phones or laptops. It is widely used to conduct polls, quizzes, and collaborative activities that support both formative assessment and learner engagement. The real-time nature of AhaSlides enables instructors to gauge students' understanding and make immediate instructional adjustments. Studies show that interactive tools like AhaSlides enhance student motivation, learning outcomes, and digital communication skills (Morris et al., 2021; Sutisna et al., 2022; Al-Sharafi et al., 2023; Wang & Lee, 2021). It also supports flexible access across devices, which is particularly advantageous in a post-pandemic hybrid learning environment.

Furthermore, the use of AhaSlides aligns with the principles of constructivist learning, where students build knowledge through interactive, meaningful experiences. These tools help implement Universal Design for Learning (UDL), ensuring that students with varying needs and backgrounds can access content equitably. Media-enriched environments foster autonomy, exploration, and critical thinking, which are essential skills in modern culinary education (Kim & Park, 2021; Rahmat et al., 2021; Park et al., 2023; Torres & Ortega, 2022). Given these benefits, AhaSlides offers an ideal solution for enhancing instruction in subjects that require both technical accuracy and creative skill, such as choux pastry.

2. METHODS

This research uses the R & D method at level 1 because the results of this research will produce interactive presentation-based learning media products using AhaSlides software on choux paste material.

"Conducting research but not continuing with product manufacture and not conducting field testing. In this case the research was carried out with the aim of producing a product

design and the design was validated internally (expert and practitioner opinion) but not tested externally (field testing). The steps used in this research can be seen in the following Figure 1.

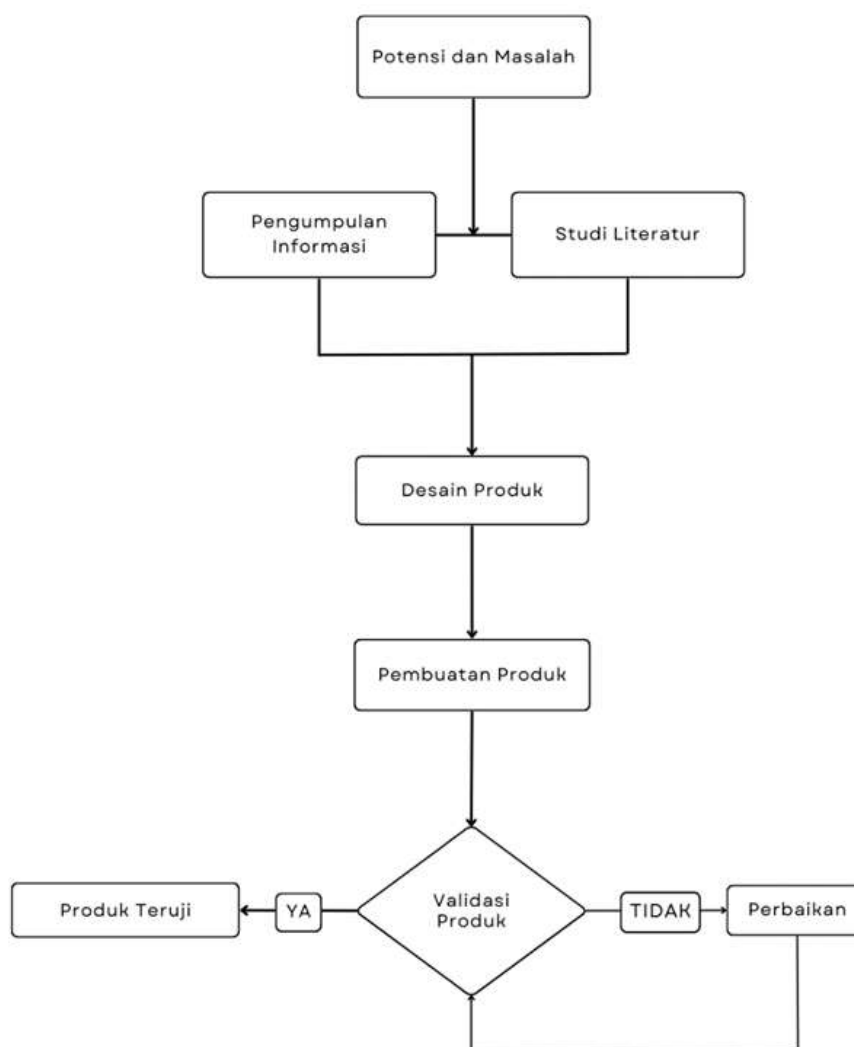


Figure 1. Diagram

The following is an explanation of several of these stages:

1) Potential and problems

The potential and problem identification stage was carried out using the direct observation method regarding the learning media used in the implementation of pastry and bakery subjects carried out by researchers while participating in the field practice program at Telkom Bandung Tourism Vocational School.

2) Literature study and Information Gathering

Information collection and literature studies were carried out by conducting a literature review regarding learning, learning media and interactive media to study the theoretical foundations underlying the development of interactive presentation-based learning media using Ahaslides software on choux paste material at Telkom Bandung Tourism Vocational School.

3) Product Design

Making interactive presentation product designs using Ahaslides as a learning media including preparing learning materials, handouts for designing interactive presentation-based learning media development using Ahaslides software on choux paste material.

4) Product Manufacturing

This stage is the stage of creating an interactive presentation of choux paste material, including creating an interactive presentation and the editing process which refers to handouts and storyboards.

5) Product Validation

Product validation is carried out by experts to assess the suitability of the product. At this stage, experts are asked to provide assessments and suggestions for improvements to the product for improvements to be made by the author. The aspects that will be assessed are material aspects, linguistic aspects, media aspects.

6) Product Revision

At this stage, a revision process is carried out according to input from validator experts to improve the product so that it meets the applicable criteria, and the validation process is carried out again until there is no input from experts and the product is suitable.

7) Tested Products

The tested product is an interactive presentation with a format that has been validated and is suitable for use.

3. RESULTS AND DISCUSSION

3.1. Result

The results of this research lead to data obtained through several stages of data collection through preliminary studies, observation and expert judgment. The results of this research obtained planning for developing interactive presentation-based learning media using Ahaslides software, creating interactive presentations using AhaSlides software on choux paste material in pastry and bakery subjects, and validation test results for interactive presentations using AhaSlides software.

The subjects studied were Pastry and Bakery Products, Basic Competency 3.9 Analyzing Choux Paste. Thus, the object of this research is class XI students who take the Pastry Bakery Products subject. This observation was carried out during the Field Practice Program (PPL) activities at Telkom Bandung Tourism Vocational School.

The product in this research is an interactive presentation using AhaSlides software which has been validated by Dadi Mulyadi, S.Pd, MT, media lecturer at the Education Technology Study Program, Faculty of Education, Indonesian Education University, Bandung, Dra. Lilis Siti Sulistyaningsih, M.Pd., Indonesian language lecturer at the Indonesian Language Education Study Program, Faculty of Language and Literature, Indonesian Education University, Bandung and material expert namely Kadhafiah Hilmi, S.Pd who is a material expert in the field of pastry and bakery who is the Head Telkom Bandung Tourism Vocational School.

Planning the Development of Interactive Presentation Based Learning Media Using AhaSlides Software on Choux Paste Material

3.1.1. Potential and Problems

The stages of potential problems are carried out using the observation method. Observations were carried out at the Telkom Bandung Tourism Vocational School, when the researcher was carrying out Field Introduction to Educational Unit activities during the

Pastry Bakery Products subject. In the observation process, the author found that during the delivery of the material, 77% of students had grades on the choux pastry material that were below average. The author also conducted searches during classroom learning activities and found that many students did not pay attention to the material presented by the teacher due to the use of media that was less interesting and interactive. After going through a discussion process with the teacher, it emerged that there was a need to develop learning media that were more interactive and interesting during the learning process. From this problem, the author had the idea to develop simple presentation media into interactive presentation-based learning media using AhaSlides software

The observation stage is carried out in several steps, namely determining the object being observed, collecting facts related to the object, and preparing a journal to record the results of the observation, taking notes, and editing the results of the observation. Apart from that, direct interviews were conducted with the resource person, namely the pastry and bakery products subject teacher, namely Ida Farida, S.Pd.

3.1.2. Literature Study and Information Gathering

This stage is carried out by searching for relevant sources such as textbooks, scientific articles, websites, recipe reviews, and other sources that have information related to the material to be presented. The results of the literature study and information gathering are contained in the form of a handout which will be used as reference material in interactive presentation-based learning media using Ahaslides software on choux paste material, which can be seen on the attached page.

3.1.3. Material Preparation

At the design stage the researcher carried out two stages, namely:

1) Material Design

Basic competencies

3.9. Analyzing cakes from choux paste

Learning objectives

Through discussions, extracting information, and observations, students are expected to be able to:

1. Identify Cakes from choux paste with confidence
 2. Explain the tools and materials used for manufacturing cake made from eclair dough (choux paste) properly
 3. Sequencing the technical procedures for making cakes from choux paste correctly
 4. Determine the criteria for cake results from choux paste correctly
 5. Apply the technique of serving cakes from choux paste correctly
- Analyze problems in making cakes from choux paste correctly.

Learning materials:

1. Identification of cakes from eclairs (choux paste)
2. Explanation of cake tools and ingredients from choux paste
3. Processing techniques for making cakes from choux paste
4. Criteria for cake results Cake from eclair dough (choux paste)
5. Technique for serving cakes from choux paste
6. The problem of making cakes from choux paste

2) Media Design

At this stage the researcher carried out several processes to design interactive learning media by creating storyboards, collecting materials, collecting images.

The material is made according to available references, and is arranged coherently in the form of handouts to make it easier for students to study the material.

Collection of photos/images, videos, etc. Images/photos are downloaded from various sources which are then included in learning media to support material. Video on how to make choux paste as support for this material. All objects are processed using Ahaslides Software to be used as interactive learning media

3.1.4. Create a script or storyboard

Storyboard is a description of the process of making learning media which was created to facilitate the process of making learning media products which can be seen in Appendix page 71.

3.2. Creating Interactive Presentation Based Learning Media Using Ahaslides Software on Choux Paste Material

In this process, media creation goes through a series of stages. Namely compiling all components such as material, evaluation, images, videos into Interactive Learning Media using AhaSlides software. The process of creating learning media is structured according to a previously designed storyboard. The design results in the form of a lossless compression file format (*.png) are then applied to the application background.

3.2.1. Create an account on AhaSlides software

Account creation is done on the main display of the AhaSlides website by pressing the available registration option. Creation is done by filling in your personal information and including your email address. The registration process requires verification of the attached email account by opening a letter from the ahaslides developer which contains a link to click. The account will be verified and can be used to create interactive presentation-based learning media using Ahaslides software on choux paste material.

3.2.2. Create files in AhaSlides software

Creating files in the AhaSlides software can be done by accessing the main page after logging in using AhaSlides. Files can be created by pressing the create button then selecting the create new option.

3.2.3. Creation of Interactive Presentations

Creating interactive presentation-based learning media using Ahaslides software on choux paste material through a series of processes such as entering designs into Ahaslides software, inserting material and supporting images into Ahaslides software, entering questions into Ahaslides software, and creating procedures for using interactive presentation-based learning media using Ahaslides software. on choux paste material.

The following is the process of creating Interactive Presentation Based Learning Media Using Ahaslides Software on Choux Paste Material:

1) Main View

When you open the application, the main display will appear in the form of an animation in graphics interchange format (*.gif) which is a type of format that uses a bitmap image format and supports 8 bits per pixel in each image.



Figure 2. Main View

2) Instructions for use

Guide on how to use interactive presentations via AhaSlides software



Figure 3. Display Instructions for Use

3) Log In View

When you move to the next page, a QR Code scan display will be available so that students can follow the learning process interactively, and there is also a menu feature at the bottom left and a chat column that can be used to communicate.



Figure 4. Log In View

4) Display the title of the main material

Contains a display to introduce the main topic of discussion of the material to be presented. The title of the material and basic competencies as well as the name of the subject are listed.



Figure 5. Display of Main Material Title

5) Display of learning objectives

On this page, a display of the learning objectives in the choux paste material will be available so that students can understand the learning objectives in the material that will be presented



Figure 6. Learning Objectives Display

6) Interactive display of word clouds

Next is the interactive slide display of word clouds, where this feature helps to help visualize the popularity of words or phrases that are thought by the audience. This feature simply shows how words are visualized, and to gather understanding learners can submit their own words



Figure 7. Word Clouds Feature View

7) Material

This page contains several material displays which are sorted based on stages starting from understanding, history, materials used, equipment used, cooking methods, tips on making, to how chemical reactions occur during the process of making choux pastry products.



Figure 8. Material View

8) View video of making choux pastry

This display presents videos associated with videos on the YouTube page which are useful for enriching the material to be presented and providing audio-visual information about the process of making the product.

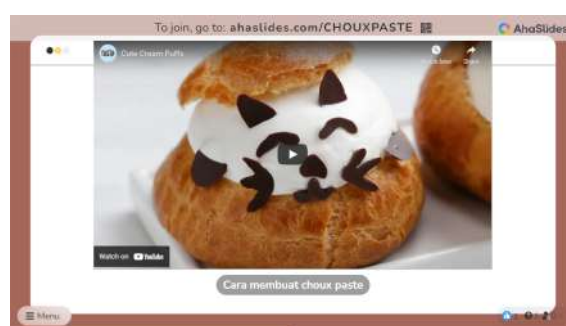


Figure 9. Video view of making choux paste

9) Evaluation

The evaluation page is designed to resemble a fun quiz with questions related to the material that has been presented. There are 3 questions with a competition quiz model so that the evaluation process is enjoyable.

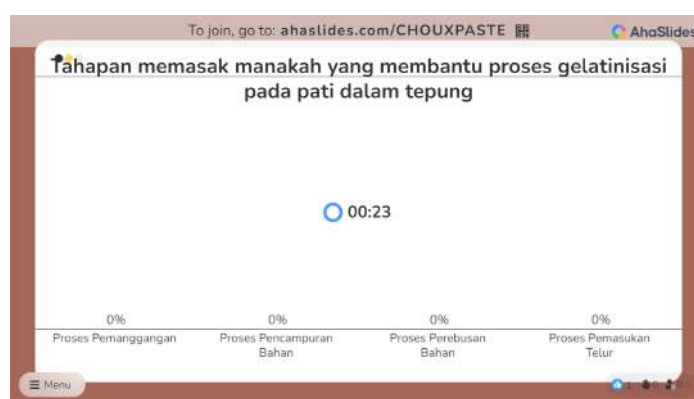


Figure 10. Evaluation View

10) Task

This display provides information about the assignments that will be given with directions from the teacher.



Figure 11. Task View

11) Handout link

This display displays a link connected to an online handout document which is useful as additional material and information about choux pastry products, so that students can read it easily.



Figure 12. Handout View

12) Closing

This display provides information to students that the learning activity has been completed.



Figure 13. Closing View

3.3. Carrying out Validation Tests for Interactive Presentation Based Learning Media Using AhaSlides Software on Choux Paste Material

3.3.1. Material Expert Validation Analysis

At the data analysis stage the learning media is tested for suitability by material experts. This instrument analysis is used to determine the suitability of the learning media aspect, namely the content of the material.

The material expert validation process was carried out by a material expert who is the Principal and teacher in the pastry bakery sector at Telkom Bandung Tourism Vocational School, namely Mrs. Kadhafiah Hilmi, S.Pd. Validation will be carried out on Thursday, June 30 2022 at the Telkom Bandung Tourism Vocational School.

Table 1. Material Expert Validation Results Table2Material Expert Validation Results

Aspect	Item	Appropriateness
Material Contents	1. Suitability of material to the syllabus	Worthy
	2. Suitability of material to learning objectives	Worthy
	3. Conformity of material with competency standards	Worthy
	4. Suitability of material with basic competencies	Worthy
	5. The correct choux paste ingredients are correct	Worthy
	6. The completeness of the materials for the choux paste making process is correct	Worthy
	7. Knowledge of choux paste making tools is correct	Worthy
	8. Knowledge of the ingredients for making choux paste is correct	Worthy
	9. Knowledge of general information regarding choux paste is correct	Worthy
	10. The process of making choux paste is arranged sequentially	Worthy
	11. The manufacturing stages are arranged systematically and specifically	Worthy
	12. The characteristics of choux paste are correct	Worthy
	13. The material is written in standard language	Worthy
	14. Accurate drawing of tools and materials for the process of making choux paste	Worthy
	15. Easy to understand images	Worthy
	16. Accuracy of presentation in presenting material	Worthy
	17. The presentation of the material is coherent	Worthy
	18. Easy to understand overall	Worthy

According to the results of the second stage of validation, it can be concluded that all aspects have received appropriate assessments and no input has been given, so that the learning media in terms of material can be declared appropriate.

3.3.2. Language Validation Analysis of Material Content by Linguistic Experts

The linguist validation process is carried out by a linguist who is a Lecturer in Indonesian Language Education, Faculty of Language and Literature Education, Indonesian Education University, Mrs. Dra. Lilis Siti Sulistyaningsih, M.Pd..

Validation was carried out on Friday, July 15 2022. The validation results can be seen in the following table:

Table 3. Linguist Validation Results

Aspect	Item	Appropriateness
Straightforward	1. Accuracy of sentence structure	Worthy
	2. Sentence effectiveness	Worthy
	3. Standardity of terms	Worthy
Communicative	4. Message readability	Worthy
	5. Accuracy in the use of language rules	Worthy
Dialogic and Interactive	6. Ability to motivate messages or information	Worthy
	7. Ability to encourage critical thinking	Worthy
Suitability and consistency with the level of development of students	8. Suitability of students' intellectual development	Worthy
	9. Suitability to the level of emotional development of students	Worthy
Sequence and integration of thought flow	10. Sequence and integration between learning activities	Worthy
	11. Sequence and coherence between paragraphs	Worthy
Use of terms, symbols, or icons.	12. Consistency in use of terms	Worthy
	13. Consistent use of symbols or icons	Worthy

According to the table above, it can be concluded that the results of the linguist's validation are appropriate in all aspects so that the learning media from the linguist's perspective is appropriate and can be used.

3.3.3. Media Expert Validation Analysis

The media expert validation process was carried out by a media expert who is a Lecturer in Educational Technology, Faculty of Education, Indonesian Education University, Mr. Dadi Mulyadi, S.Pd, MT,.

Validation was carried out on Thursday, July 21 2022. The validation results can be seen in the following table:

Table 4. Media Expert Validation Results

Aspect	Item	Appropriateness
Learning Media Display	1. Attraction/Opening	Worthy
	2. Text Readability	Worthy
	3. Appropriate text font	Worthy
	4. Text Color Harmony with Background	Worthy
	5. Image suitability to material	Worthy
	6. Image Sharpness	Worthy
	7. Clarity of Instructions for Media Use	Worthy
	8. Arrangement or Layout Arrangement	Worthy
	9. Consistency of Button Usage	Worthy
	10. Appropriate Use of Fonts	Worthy

Learning Media Programming	11. Speed in opening media (Loading)	Worthy
	12. Simplicity of Visual Media	Worthy
	13. Clarity of Instructions	Worthy
	14. Ease of Use	Worthy
	15. Text Efficiency	Worthy
	16. Ease of Opening and Closing Programs	Worthy
	17. Ease of Using the Program	Worthy
	18. Increasing Learning Motivation	Worthy
Media Benefits	19. Increasing Student Interactivity	Worthy
	20. Use of Learning Media is Easier to Understand	Worthy

Based on the results of the second stage of validation, there are no further suggestions for improvement and the assessment scale is appropriate. So that learning media is suitable for use in terms of media.

3.2. Discussion

The discussion of research results on the development of interactive presentation-based learning media using AhaSlides software on choux paste material aligns closely with the objectives of this study. The first stage involved planning the development of the media, which began with classroom observations at Telkom Bandung Tourism Vocational School. The researcher observed that the current instructional approach lacked interactive support and that many students struggled to understand the choux paste preparation process. These findings were consistent with those from unstructured interviews and the researcher's PLSP (Professional Field Experience) activities. Effective media planning, as emphasized by Al-Azawei et al. (2020), is critical for ensuring that instructional tools meet learners' cognitive and behavioral needs. Media designed to change student behavior or improve learning outcomes must be grounded in a well-structured, evidence-based planning process that considers content complexity, learner characteristics, and delivery modes (Kim & Lee, 2020; Lee & Wong, 2022; Zainuddin et al., 2020).

The second stage involved the creation of interactive presentation-based learning media using AhaSlides software. This process began with the collection and organization of instructional materials, followed by storyboard development and media visualization using digital design tools. The instructional content was adapted into interactive slides that allowed real-time audience engagement. The media was designed to ensure consistency between the presenter's view and the audience's screen, reducing cognitive load and ensuring smooth content delivery. According to Cabero-Almenara et al. (2021), effective digital media development must emphasize learner interaction, interface clarity, and narrative coherence to ensure optimal learning experiences. Recent research also shows that media embedded with interactive features such as quizzes and live responses significantly enhances motivation and retention in vocational learning contexts (Kusuma & Cahyaningtyas, 2023; Park et al., 2023; Chang et al., 2020).

The third stage focused on the validation test of the developed media, conducted by three expert validators using a structured questionnaire. This process assessed the feasibility of the media across four key dimensions: content accuracy, design quality, usability, and pedagogical

relevance. The results showed that the media was rated as “very feasible” in all aspects. In line with Pellas and Peroutseas (2021), validation is a crucial phase in instructional media development to ensure that educational tools are functionally effective, pedagogically appropriate, and user-friendly. The importance of expert validation is reinforced by recent literature, which emphasizes that digital learning tools must be aligned with student learning outcomes, accessible across devices, and intuitive to use (Kim & Park, 2021; Widodo et al., 2022; Al-Sharafi et al., 2023).

Overall, this research highlights that the development of interactive learning media using AhaSlides is both feasible and impactful. It offers a practical solution to the challenges faced by vocational students in understanding complex material, such as choux paste preparation. Furthermore, it aligns with 21st-century teaching practices by integrating technology-enhanced, learner-centered pedagogies that promote engagement, creativity, and autonomy.

4. CONCLUSIONS

The results of planning the development of interactive presentation-based learning media using Ahaslides software on choux paste material with material design in the form of handouts and storyboards created to support the process of creating interactive presentation learning media using AhaSlides software. The material design is made in the form of a handout which is made into an e-book which is used as a reference source for material used in interactive presentations using AhaSlides software. From the results of the storyboard design, 16 storyboard slides were created which were used to design interactive presentation-based learning media using AhaSlide software. The results of creating interactive presentation-based learning media using AhaSlide software, with a total of 31 slides consisting of an opening section, instructions for use, materials, creation video, quiz and closing. The validation test results of interactive presentation-based learning media using Ahaslides software on choux paste material were declared suitable for use. The validation test process with media experts, material experts and language experts stated that the media was suitable for use and there was no further improvement process.

5. REFERENCES

- Al-Azawei, A., Parslow, P., & Lundqvist, K. (2020). Barriers and opportunities of e-learning implementation in Iraq: A case of public universities. *Education and Information Technologies*, 25, 3205–3226. <https://doi.org/10.1007/s10639-020-10131-2>
- Al-Sharafi, M. A., Arshad, M. R., & Alajmi, M. (2023). Enhancing learner participation through mobile-based presentation apps in vocational training. *Education and Information Technologies*, 28, 1153–1171. <https://doi.org/10.1007/s10639-023-11784-1>
- Cabero-Almenara, J., Llorente-Cejudo, M. C., & Morales-Cevallos, M. B. (2021). Design and validation of a technological acceptance model for flipped learning in higher education. *Australasian Journal of Educational Technology*, 37(5), 66–82. <https://doi.org/10.14742/ajet.6904>
- Chang, C. Y., Hwang, G. J., & Yen, Y. F. (2020). Effects of flipped classroom integrated with mobile technology on students’ learning performance and perceptions. *Interactive Learning Environments*, 28(4), 464–481. <https://doi.org/10.1080/10494820.2019.1674067>

- Ismail, A., Hamid, R., & Latif, L. A. (2022). Engagement strategies using interactive presentation media in technical training. *Journal of Technical Education and Training*, 14(1), 89–98. <https://doi.org/10.30880/jtet.2022.14.01.010>
- Kim, J., & Lee, W. (2020). Developing a framework for validating digital learning materials: A study in vocational high schools. *International Journal of Educational Technology in Higher Education*, 17(1), 88. <https://doi.org/10.1186/s41239-020-00232-z>
- Kim, Y., & Park, S. (2021). Digital inclusion in multimedia learning: Designing inclusive education through assistive technologies. *International Journal of Educational Technology in Higher Education*, 18(1), 56. <https://doi.org/10.1186/s41239-021-00285-6>
- Kurniawati, D., & Susanti, R. (2023). Improving culinary learning outcomes using interactive presentation methods. *Journal of Education and Practice*, 14(2), 45–53. <https://doi.org/10.7176/JEP/14-2-07>
- Kusuma, I. W., & Cahyaningtyas, A. I. (2023). Enhancing student engagement using interactive media in vocational education: A study on AhaSlides implementation. *Journal of Technical Education and Training*, 15(2), 34–42. <https://doi.org/10.30880/jtet.2023.15.02.004>
- Lee, Y. C., & Wong, W. Y. (2022). Interactive multimedia as a tool for enhancing culinary education in vocational schools. *International Journal of Interactive Mobile Technologies (IJIM)*, 16(8), 48–60. <https://doi.org/10.3991/ijim.v16i08.29999>
- Lin, Y. C., Lee, L. T., & Lai, Y. H. (2020). Digital learning for vocational education: Barriers and strategies. *Journal of Vocational Education Studies*, 3(1), 25–34. <https://doi.org/10.5281/zenodo.3883409>
- Morris, C., Pinheiro, H., & Moniz, H. (2021). Real-time feedback and learner performance: The role of audience response systems. *Education and Information Technologies*, 26(6), 5465–5482. <https://doi.org/10.1007/s10639-021-10573-z>
- Ozturk, E., Turan, M., & Sahin, I. (2020). Interactive e-learning tools in vocational education: A case study. *International Journal of Emerging Technologies in Learning*, 15(11), 89–103. <https://doi.org/10.3991/ijet.v15i11.14215>
- Park, H., Lee, J., & Choi, M. (2023). Assessing creativity and digital literacy in media-rich classrooms: Toward performance-based evaluation. *Journal of Educational Multimedia and Hypermedia*, 32(2), 115–134. <https://doi.org/10.4018/JEMH.20230401>
- Pellas, N., & Peroutseas, E. (2021). Designing and validating a model for evaluating digital learning environments in vocational education. *British Journal of Educational Technology*, 52(4), 1596–1612. <https://doi.org/10.1111/bjet.13090>
- Putra, R. A., Wibowo, D. T., & Nurmala, S. (2021). Pengembangan media pembelajaran interaktif berbasis web untuk materi pastry di SMK. *Jurnal Pendidikan Teknologi dan Kejuruan*, 24(2), 110–119. <https://doi.org/10.21831/jptk.v24i2.40759>
- Rahmat, M., Nasir, M., & Fadilah, N. (2021). Constructivist-based learning with interactive media to improve culinary students' comprehension. *International Journal of Interactive Mobile Technologies (IJIM)*, 15(14), 122–135. <https://doi.org/10.3991/ijim.v15i14.23985>
- Salamah, U., & Fitria, R. (2023). Challenges in practical culinary education in vocational schools. *International Journal of Hospitality & Culinary Arts*, 6(1), 56–66. <https://doi.org/10.34128/ijhca.v6i1.354>

- Sutisna, E., Aditomo, A., & Lestari, N. (2022). Penggunaan AhaSlides untuk meningkatkan interaksi siswa dalam pembelajaran daring. *Jurnal Teknologi dan Pembelajaran*, 13(1), 41–50. <https://doi.org/10.21009/jtp.v13i1.30234>
- Torres, R., & Ortega, E. (2022). Media production in education: Fostering creativity and digital citizenship in the post-pandemic classroom. *Journal of Media Literacy Education*, 14(1), 45–60. <https://doi.org/10.23860/JMLE-2022-14-1-4>
- Wang, J., & Lee, H. (2021). Digital teaching tools and student motivation: Exploring interactivity in learning platforms. *Interactive Learning Environments*, 29(7), 1123–1140. <https://doi.org/10.1080/10494820.2020.1748286>
- Widodo, H., Iskandar, S., & Sudrajat, A. (2022). Validation of interactive digital learning modules for culinary practice in vocational schools. *International Journal of Instruction*, 15(3), 477–492. <https://doi.org/10.29333/iji.2022.15326a>
- Wijaya, A., & Gunawan, I. (2022). Analisis kendala pembelajaran praktik kuliner berbasis daring. *Jurnal Pendidikan Vokasi*, 12(1), 77–88. <https://doi.org/10.21831/jpv.v12i1.39832>
- Zainuddin, Z., Shujahat, M., Haruna, H., & Chu, S. K. W. (2020). The impact of gamified flipped learning on student engagement and motivation. *Computers & Education*, 145, 103729. <https://doi.org/10.1016/j.compedu.2019.103729>
- Zhang, J., & Zhu, C. (2021). Enhancing engagement through interactive platforms in hybrid learning. *Education and Information Technologies*, 26, 7459–7476. <https://doi.org/10.1007/s10639-021-10569-9>