Multimedia as Digital Literacy in Culinary Arts Vocational Learning

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Abstract
Learning media plays an important role in attracting students attention to understand the material. The results of observations of D3 Tata Boga 2017 students showed that only 18 out of 39 students reached the minimum completion criteria (78%) on napkin folding material, with learning resources limited to modules and jobsheets. One of the learning media through computers is using adobe flash player. The use of adobe flash player has not been utilized by the Culinary Study Program for student learning resources on napkin folding material. Based on this fact, learning to make napkin folds requires a stimulus from the lecturer, namely through the development of learning media. This study aims to develop and test the feasibility of interactive multimedia as digital literacy on napkin folding material. This study used R&D with a 4D development model (Define, Design, Develop, and Disseminate). The data analysis technique used the Content Validity Ratio (CVR) method. The interactive multimedia-based program uses Adobe Animate 2019 and Adobe Premiere Pro CC 2019. The interactive multimedia developed consists of several features including an introductory menu, theory, video tutorials, and knowledge test questions as the final score. The results show user validation of 0.41 and are included in the appropriate CVR criteria. Based on the results of the validation of the material expert, the feasibility was obtained at 94.6% and 85.7% for the high feasibility aspect criteria. The results of the media expert validation obtained a feasibility value of 86.4% and 81.8% for the high feasibility aspect criteria. The field group trial consisting of 30 culinary program students obtained results of 84.38% and were included in the feasibility criteria. It is concluded that interactive multimedia as digital literacy is declared "suitable" as a learning resource in the Food and Beverage Service course.

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INTRODUCTION

The rapid development of technology has positive and negative impacts in various fields, especially in education (Abu Talib et al., 2021; Bulman & Fairlie, 2016). Interesting types of media help educators in delivering learning materials to students (Sudarsana et al., n.d.). With class conditions with a large number of students, sometimes it is difficult to focus on the material being delivered, especially in practical courses in the material demonstration process (Rahim et al., 2022). The learning patterns given to students also vary greatly depending on the lecturer providing the material.

Based on observations of students in the Culinary Arts Education Study Program, it was found that most students did not master and were passive in the napkin folding material. Napkin folding is the material for forming and folding napkins of a certain size

into beautiful and attractive shapes where the napkins are usually placed on the table as decoration, and function to wipe the mouth when eating (Azizah et al., 2024). In terms of material value, 78% of students who received a score according to the minimum completion criteria of 18 out of 39 students. Trianto (2024) said that a class is said to have completed learning if at least 85% of students obtain that score.

Student learning resources or references are still limited to the modules and job sheets that have been used so far. The digital reference that students use is YouTube, where the existing material does not match the material needs that are in accordance with CPL and the characteristics of students in restaurant arrangement and service lectures. Learning is carried out using the help of PowerPoint media on the basic theory of napkin folding. However, students do not master the material and cannot follow the folding examples from the theory presented. The use of digital media can create new, innovative methods in learning so as to produce an effective learning process. Digital media is one of the uses of technology in the learning process that can help students access material according to their individual learning style and speed (Balakrishnan & Gan, 2016; Beacham & Alty, 2006; Haleem et al., 2022; Thompson, 2013). Learning resources that use digital media have been shown to increase student motivation and interest in learning subjects and materials (Alphonce & Mwantimwa, 2019; Lin et al., 2017; Umarova, 2020).

To minimize the gap in learning the napkin folding material, multimedia development was carried out by utilizing Adobe Flash Player. Multimedia used in the learning process combines several components such as text, audio, video, graphics, and animation (Abdulrahaman et al., 2020; Irawan, 2021; Syafruddin et al., 2021; Windiartha et al., 2017). Adobe Flash is a product/ software from Adobe that is used for the process of creating and processing animations, images, or videos (Matta & Gupta, 2021; Reimers & Stewart, 2007). Adobe Flash Professional CS5 is a software used to create interactive digital animations that are widely used to create interesting applications and software because they can use various components such as images, sound, video, and animation that can also be combined with other software (Chun, 2012). This software can be collaborated with the web to enrich features that can increase creativity in creating media content optimally and attractively (Febriati et al., 2022; Georgenes, 2012; Gerantabee & Team, 2011). The appearance, function and choice of various palettes, as well as a very complete set of tools are very helpful in creating interesting animated works. Therefore, this software is commonly and popularly used to create good animation and multimedia works.

Adobe Flash Player is used to make interactive learning effective, efficient, and quickly accessible to students (Ampera, 2017; Menggo et al., 2021) because education is required to develop science and technology rapidly. One software or applications that can increase learning motivation by using Adobe Flash C (Hidayah et al., 2017). Heldman (2012) stated that Adobe Flash CS6 is good software. used to support interactive learning. Because, interactive learning media With the Adobe Flash CS6 application you can combine graphics, animation, sound, and more. have the ability to interact with users.

Based on this theory, it is hoped that using Adobe Flash Player can create media that improves student understanding. The results of Yenni et al. (2018) research on the use of audio-visual media with interactive CD types say that students will find it easier to accept audio visual media because this media does not only involve one type of sensory organ but can also improve student learning outcomes. The use of audio-visual media has several advantages, including students being able to remember the material presented through images and sound, stimulating critical thinking skills, and increasing the efficiency of learning and student understanding (Marlena et al., 2019). Based on these advantages, it is hoped that the use of learning multimedia can provide better results compared to audio-visual media.

Several research results related to the use of Adobe Flash Player as a learning medium have positive results (Fandini et al., 2021; Muslim et al., 2018; Windiartha et al., 2017). The use of Adobe Flash Player at the learning orientation stage contributes to the activeness of the learning process and the delivery of learning materials and messages (Asmarany et al., 2023; Ben Ma, 2018). Learning media in the form of short story texts created with Adobe Flash CS6 has proven to be an excellent medium and is able to improve students' understanding of learning about literature (Siburian et al., 2020). The application of Adobe Flash Player-based media contributes to better performance in learning soccer skills (Riyadi et al., 2020).

Based on these studies, researchers focus on developing interactive multimedia-based learning media on napkin folding material using Adobe Flash Player to create interactive multimedia that can improve the understanding of vocational education and culinary arts students.

Interactive media using the Adobe Flash application contains material that is equipped in the form of text, images, and videos so that it is easier to provide an overview to students about the material of napkin folds, and with the navigation button will make students have full control of the media and can repeat material that has not been understood. This media also has several advantages compared to other media, namely the element of interactive relationships. Computers realize the relationship between stimulus and response, foster inspiration, and increase interest. Through this media, students can foster interest and enthusiasm for learning because this Adobe Flash-based interactive learning media creates interaction for students (Istiqomah, 2011).

METHODS

The method used is Research and Development (R&D), which is a type of research that aims to produce and develop products (Arnold & Bell, 2001; Richey & Klein, 2014). This research uses R&D with the 4D development model (Define, Design, Develop, and Disseminate). Multimedia-based learning media was applied using experimental research. This study used a pre-test and post-test randomized control group design.

The subjects in this study were 39 students of the 2018 Culinary Study Program who took the Basic Table Service course. Data collection methods, namely: (1) Observation, data obtained based on observations during the implementation of learning napkin folding material; (2) Interview, conducted to the lecturer to find out the basic competencies that must be achieved; (3) Questionnaire, in the form of a closed questionnaire. Data collection tools used in the research, namely field study instruments, instruments for media and material experts, and student assessment instruments.

1. Field Study Instrument Lattice

Table 1. Observation and Interview Grids

No.	Aspects	Indicator	Methods
1.	Subject matter	Basic competencies to be achieved, learning objectives, student learning references	Interview
2.	Learning process	Methods applied and media used	Observation
3.	Student characteristics	Student attitude, classroom atmosphere	Observation
4.	Means infrastructure	Availability media, devices learning, learning resources	Interview, Observation

The results of interviews and observations show that learning resources are limited to modules and books. Students tend to be passive because learning methods are in the form

of lectures, discussions, and demonstrations with media in the form of modules and Power Point, and classes are equipped with LCD to support learning.

2. Instrument Lattice for Media Experts

Table 2. Instrument Lattice for Media Experts

No.	Aspects	Indicator	Question No.
1.	Media display	Interactive display design	1
		Text and image sizes are compatible with laptops/computers	2
		Colors and motifs and colors do not disturb learners' concentration	3
		Accuracy selection color so comfortable to look at	4
		Accuracy of the choice of writing type (text)	5
		Readability of writing (text)	6
		Accuracy of text size selection (*font*)	7
		Appropriateness of music illustration (*backsound*)	8,9
		Navigation effectiveness	10, 11, 12
		Button (button) has attractive shape and works well	13, 14
2.	Programming	Ease of use of the program	15
		Ease of selecting the program menu	16
		Clarity of instructions for use	17
		Freedom to choose video material to study	18
		Ease of interaction with the program	19
		Ease of exiting the program	20
		Button function speed (navigation performance)	21
		Accuracy reaction button (navigator button)	22
	Total items		22

Validation of the media expert instrument from the assessment of 2 validators, then the next step is to calculate the Content Validity Index (CVI).

3. Instrument Lattice for Material Experts

Table 3. Instrument Lattice for Material Experts

No.	Aspects	Indicator	Question No.
1.	Learning	Accuracy of material content with competency standards	1
		The accuracy of the content of the material with learning indicators	2
		The accuracy of the content of the material with the learning material	3
		Accuracy of title with learning material	4
		According to student needs	5
		Helps students learn independently	6
		Helps increase learning interest	7
2.	Content	Help learn about napkin folds	8
		Help explain types of napkin folds	9

Clarity example folds napkin given	10
Help learners differentiate napkin folds with enough examples	11
Use of language used in learning media	12
Use of language appropriate to the level of the learners	13
Appropriateness of images and videos	14
Total items	14

Validation of the material expert instrument from the assessment of 2 validators on the video assessment instrument and the instrument as a whole. Then the next step is to calculate the Content Validity Index (CVI).

4. Grids of Student Assessment Instruments

Table 4. Grids of assessment instruments by students

No.	Aspects	Indicator	Question No.
1.	Programming	Ease of use	1
		Menu selection	2
		Freedom to choose materials	3
		Ease of interaction with the program	4
		Ease of exiting the program	5
		Navigation effectiveness	6
		Button function speed and button reaction	7, 8
2.	Media Display	Layout of text and images	9, 10
		Background	11
		Appropriateness of font selection and font size	12, 13
		Readability of text	14
		Clarity of music and sound	15
		The video is in accordance with the material	16
		Buttons have an attractive shape and function well	17, 18
	Contents	Integrity of material, depth material, clarity of material content	19, 20, 21
		Clarity of adequacy of examples provided	22, 23, 24
		Language clarity and appropriateness language	25, 26
		Clarity of images and illustrations	27
	Learning	Title, target users	28, 29, 30
		Variety of material	31, 32, 33, 34, 35
	Total items		35

The media that has been validated; the next step is to test it on students. The one-to-one test consisted of 3 students, the small group test consisted of 6 students, and the field group test consisted of 30 students.

The data analysis technique uses the Content Validity Ratio (CVR) method by Lawshe (Romero Jeldres et al., 2023). The Content Validity Ratio (CVR) method is called Subject Matter Experts (SME), which states whether the test items are important in the measurement objectives (Matore et al., 2018; Shrotryia & Dhanda, 2019). The results of the CVR calculation are in the form of a ratio of 0.00-1.00. In the calculations of media experts and material experts, the instrument is calculated using the following formula (Schneider et al., 2010).

$$x = \frac{\text{Number of all experts' assessment}}{\text{All experts' assessment}} \times 100\%$$

$$x = \text{Percentage Score}$$

The answer results were obtained by calculating the percentage of scores to develop the conclusions described in Table 5.

Table 5. Guidelines for Assessment Criteria for Material Experts and Media Experts

No	Scale	Criteria
1.	0% - 25%	There is no eligibility aspect
2.	25% - 50%	There are aspects of feasibility that are quite low
3.	50% - 75%	There is a fairly high feasibility aspect
4.	75% - 100%	There is a high feasibility aspect

The answer results were obtained by calculating the percentage of scores to develop the conclusions described in Table 6.

Table 6. User Assessment Criteria Guidelines

No	Scale	Criteria
1.	76% - 100%	High Product Effectiveness
2.	51% - 75%	Product Effectiveness Medium
3.	25% - 50%	Low Product Effectiveness

Effectiveness of using interactive media based on Adobe Flash Player in the development of napkin folding material can be known by increasing children's procedural cognitive about making various healthy food recipes using experimental design (before-after). The answer results are obtained by calculating the percentage of scores to develop conclusions explained in Table 7 (Arikunto, 2010).

Table 7. User Assessment Criteria Guidelines

Score	Criteria
X > 75%	Possible to do
X ≤ 75%	Not feasible

Hypothesis is a temporary answer to a research problem whose truth is still being tested empirically. Measurement of student learning achievement is done through post-test results. Hypothesis testing in this study uses the T test.

RESULTS & DISCUSSION

Interactive Media Development Results Based on Adobe Flash Player

This research has developed flash-based interactive media on napkin folding material. This media was developed using Adobe Flash using the 4D model (Define, Design, Develop, Disseminate). This media development aims to increase students' knowledge and skills about napkin folding material.

The software specifications used in the design, creation, and implementation of Flash-based interactive media about napkin folding materials are 1) Operating System: Windows 10 Pro; 2) Flash: Adobe Animate 2019; and 3) Video: Adobe Premiere Pro.

1. Needs Analysis (Define)

Needs analysis consists of two methods, namely problem analysis and learning component analysis. Both analyses are carried out using data collection methods in the form of interviews and observations. Learning materials for folding napkins require appropriate media to improve students' understanding of the material. The media developed should be media that is interesting and motivates students to learn. One of them is Adobe Flash-based media which is suitable as an interesting learning media and can be self-learning. The guidelines for compiling Adobe Flash-based media are in the form of basic course syllabuses, while the material presented is based on reference sources in books and the internet.

2. Design

The stage after analyzing potential and problems is planning the learning media to be developed. Learning multimedia needs to be designed and developed according to the final learning objectives so that the media is able to provide an experience that is comparable to the time and effort expended by teachers and learners (Abdulrahaman et al., 2020). This stage includes:

a. Making flowcharts and storyboards for learning media

Flowchart and Storyboard are arranged based on materials adjusted to the syllabus. The basic competency is to differentiate between folding napkins and making napkin folds, but in this development research the basic competency is making napkin folds.

b. Preparation of media suitability assessment instruments

The Adobe Flash-based media development instrument was created to determine the level of feasibility of the media that had been created. The instrument was in the form of a questionnaire consisting of three types of questionnaires, namely media experts, material experts and students as target media users.

3. Development

This stage is the production stage of developing learning media products. In making this napkin folding media, it is made based on a previously created design. The design is in the form of a flowchart and storyboard. This media is made using Adobe Animate 2019 and Adobe Premiere Pro CC 2019. This software is able to integrate several media including text, images, animation, video and music.

The first page of flash-based learning media containing the title Interactive Learning Media Folded Napkin Material, "UNJ Logo", "Faculty of Engineering", "Culinary Arts Study Program", "Jakarta State University". Content of the media that has been created using Indonesia language can be seen in the image below:

Figure 1. First Page Napkin Folding Media

The next button on the media display when clicked will display an opening video containing "Opening Remarks", "Exposure of expected competencies after viewing this learning media". This page contains a next button to enter the next learning media. The destination page can be seen in Figure 2 below:

Figure 2. Napkin Fold Media Advanced Page View

The next button on the media display, when clicked, will display the main page containing menus that students can select.

Figure 3. Main Menu Page View of Napkin Folding Media

If the next button is clicked, the first video material will appear containing text in the form of the types of folds "Pyramid", "Arrow", "Bird Heaven", "Bishop's Hat", "Rose Bud". The characteristics of the page display size can be seen in Figure 4 below:

Figure 4. Example of a video tutorial page display

On the main page there is a sixth menu, namely the practice question button. This button will display a page of practice questions related to the napkin folding material.
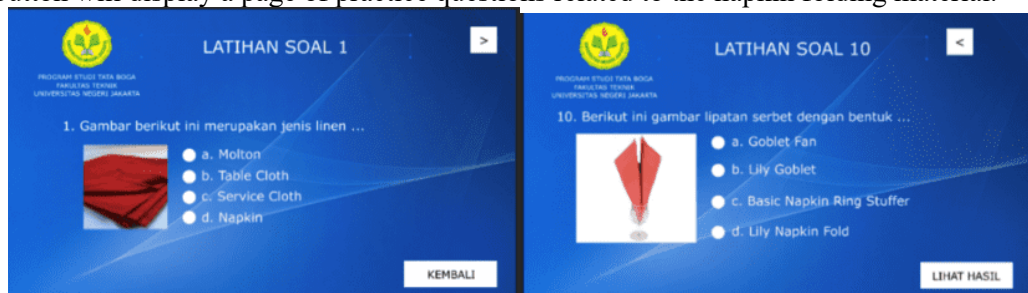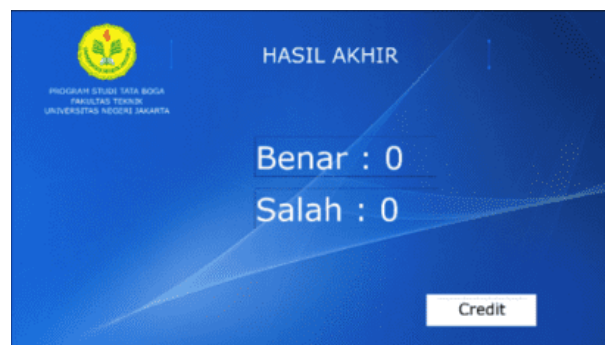

Figure 5. Quiz Question Page View

Figure 6. Final Quiz Score Page View

On the main page there is an exit button that functions to end the Serbet Folding learning media program. This button will display a re-confirmation page whether to exit the program or not.

Figure 7. Display of the Napkin Folding Learning Media Page

Then, a feasibility test and user trial were conducted. The following are the assessment results in the table.

Table 8. User Assessment Criteria Guidelines

No	Evaluation	Scale (Percentage)		Criteria
1	Subject Matter Expert Validation	94.6%	85.7%	High eligibility
2	Media Expert Validation	85.7%	86.4%	High eligibility
3	One-on-One Trial	87.14%		High eligibility
4	Small Group Trial	86.31%		High eligibility
5	Field Group Trial	84.38%		High eligibility

Based on the results, the interactive flash player- based media about napkin folding can be said to be worthy of being tested on Culinary Arts Education students, Faculty of Engineering, Jakarta State University. According to material experts, interactive flash-based media about napkin folding can be said to be worthy of being tested on Culinary Arts Education students, Faculty of Engineering, Jakarta State University. To support the validation results of material experts, interactive learning-based learning media is said to be effective in improving student learning outcomes because 87.60% of students have achieved KKM. The increase in student learning outcomes using interactive learning media is in line with the impact of using interactive media which can help students improve their understanding, present data in an interesting and reliable way, make it easier to interpret data, and condense information (Dunlosky et al., 2013). Based on the results of the study, it can be concluded that interactive learning media based on Basic Network learning is effective for use as a learning medium in the Basic Network learning (Islapirna et al., 2023; Pernanda et al., 2018). Interactive learning based on inspirational multimedia in general administration subjects is declared valid and suitable for use as a learning medium in schools (Akbarini et al., 2018).

A large-scale trial was conducted with 30 participants. The assessment was conducted to test the feasibility of learning media assisted by Adobe Flash Player. Students were asked to fill out a questionnaire to find out their opinions about the learning media for folding napkins. Based on observations, the percentage results were 84.38% for the feasibility criteria. The media was declared feasibility based on students' ability to use interactive media based on Adobe Flash Player about folding napkins as a learning medium in the basic Culinary Arts course. It can be concluded that the implementation of learning to fold napkins in large-scale trials was better than in small-scale trials. Media supported by Adobe Flash Player does not require improvement. This is in line with the research of Ingtyas & Akmal (2024), where interactive learning media related to the material of Spices and Herbs made using Macromedia Flash obtained a percentage of media acceptance results of 84.36% which is included in the category of a very high feasibility level.

4. Distribution

After the interactive multimedia product is declared feasible, the final stage is

Dissemination. At this stage, interactive multimedia socialization is carried out to users and field trials are carried out, both in small and large groups. Socialization is carried out to students and then a questionnaire is distributed to see the students' response to the final media developed. The results of the following regional socialization stage It can be said that the students' response to interactive multimedia learning to fold napkins is "Very Positive". This shows that students can receive the material well and really like the media that is developed because the assessment includes aspects of acceptance, attractiveness and ease of use. In accordance with the final product, it is a learning media that can be used to convey messages to recipients, especially interactive multimedia (Hashim, 2018). In accordance with the previous statement, the interactive multimedia that was developed is a learning program that contains text, images, graphics, sound, video, animation, simulations in an integrated and synergistic manner with the help of computer devices to achieve certain learning objectives where users can actively interact with the program (Darari, 2017). As well as user trials that produce results that the media has good quality and is suitable for use for learning. Finally, socialization makes the media liked and gets a positive response (Sikumbang, 2022). The feasibility of interactive learning multimedia can be seen through several things such as ease of navigation, cognitive content of media integration, attractiveness, and holistic function (Fathoni et al., 2023).This is in line with the results of research conducted by Lenny Trilestari (2012) at SMK N 12 Bandung with the thesis title "The Effect of Interactive Multimedia Use on Student Learning Outcomes on Competency Standards for Measuring Using Measuring Instruments", with the experimental research method used is Quasi Experimental Design with a Pretest-Posttes design, Nonequivalent Control Group Design, which places research subjects into two class groups consisting of experimental groups and control groups that are not randomly selected, concluding that the use of interactive multimedia has a positive effect on mastery of the material so that student learning outcomes are better.

Learning Outcome Assessment

There is an increase in learning outcomes in the pre-test and post-test results. This can be seen from the results of the T test through the SPSS 16.0 program. Based on the results of the hypothesis test, there is a significant difference between student learning outcomes between the control group and the experimental group. The pretest results are used to determine the level of difference between the two groups. The average pretest of the control group obtained 56, and the experimental group obtained 55,67. In the experimental group, there was an increase in learning outcomes in the material of folding napkins through Macromedia Flash media which was obtained by 32,33. In the control group, there was an increase in learning outcomes in the material of folding napkins through power point which was obtained by 8.

Furthermore, the implementation of the research in the experimental group was carried out by explaining the material related to the theory of folding napkins through learning media. The researcher explained and visualized the theory of folding napkins through Macromedia flash media. In contrast, the control group carried out learning through power point media. Interactive multimedia is considered suitable for delivery because it can involve animation, video, and audio. In addition, students feel more interested in learning compared to using textbook media (Cairncross & Mannion, 2001; García et al., 2007; Mishra & Sharma, 2005).

The results of the analysis show that P-value Sig. = 0.916> 0.05. This means that Ho is accepted and Ha is rejected. T $_{count}$ 0.106 < T $_{table}$ 1.6715 with degrees of freedom = n1 + n2-2 = 58. This means that Ho is accepted and Ha is rejected. The conclusion is that there is no significant difference between the pre-test results of students in the control group and the experimental group. The T-test column shows that P-value = 0.000 for 1-sided testing.

P-value Sig = 0.000 < 0.05. This means that Ho is rejected and Ha is accepted. T_{count} 8.849 < T_{table} 1.6715 with degrees of freedom = n1 + n2-2 = 58. This means that Ho is rejected and Ha is accepted. The learning outcomes of students who use interactive learning media based on flash players on napkin folding material are greater than powerpoint media. It is concluded that interactive multimedia based on flash players has a positive influence in its use. The calculation of the effectiveness of the experimental group using interactive media based on flash player on the material of folding napkins obtained 88% with high product effectiveness criteria. The calculation of the effectiveness of the control group using powerpoint on *flash player* on the material of folding napkins obtained 64% with medium product effectiveness criteria. The advantages of utilizing Macromedia Flash-based learning multimedia include producing attractive media because of several animations, providing practice quizzes and learning summaries, and having consistent and interactive navigation features that help improve learning outcomes (Heldman, 2012; Ingtyas & Akmal, 2024).

The learning outcomes of students using interactive *flash player- based learning media* on napkin folding material are greater than those of powerpoint media. It is concluded that interactive multimedia based on *flash player* has a positive influence on its use. *Macromedia Flash's ability* to create various interesting animations makes this software popular in the development of interactive learning media. For example, in the creation of learning media with Macromedia Flash for Occupational Safety and Health material which has proven effective because it has succeeded in increasing student learning outcomes by 81.92% (Ulgari et al., 2023), and also in learning media for automotive charging system material which has proven to be suitable for use in learning in vocational schools (Suyitno et al., 2020). Interactive learning media is not only developed using *Macromedia Flash* but also using other computer software. Akmal et al. (2022) who created Adobe Animate-based learning media related to table manner material. The media successfully helped in learning *table manner* because it was equipped with features, materials, practices, and video tutorials. Web-based learning media has been proven to develop creative thinking skills (Rahmawati, 2021). Interactive *website- based* media used in culinary arts learning can improve students' understanding and learning outcomes, provide students with interest in being able to learn independently at home, and practice various garnish making techniques (Fridiarty et al., 2022).

Expert assessment and student perception, the interactive learning media developed is valid, practical, and highly recommended for use as a source of independent learning for students in discrete method courses, interactive learning. The media developed is effective in improving student learning outcomes (Faruk, 2014). Media development is created due to lack of students' interest, motivation, and in the subject. The results show interactive learning media is considered feasible for use (Damarwan & Khairudin, 2017). Interactive multimedia products are available in .html file types that can be used as supporting learning resources for LMS (Learning Management System) such as Moodle, learning websites, and so on.

Based on the discussion above, it can be concluded that the use of visual media in napkin folding material can improve student learning achievement. Students find it easier to understand the material presented by lecturers using interactive multimedia based on Adobe Flash Player. This can be seen from the enthusiasm of students in following the napkin folding material with interactive multimedia based on Adobe Flash Player. Lecturers using Macromedia flash interactive multimedia will save time and energy in their delivery, and lecturers can more efficiently deliver material accompanied by images and animations.

This research is in accordance with the opinion written by Nugraheni (2015: 107) that interactive multimedia is considered suitable for delivering this material because it can

involve animation, video and audio so that students feel more interested in learning than just using textbook media. This is also in accordance with Sunaryo Soenarto's (2004: 69) statement about learning supported by the use of multimedia technology will be able to provide a concrete experience, increased learning motivation and student learning retention. So it is expected that there will be further research on the effectiveness of using Adobe Flash-based napkin folding learning media.

CONCLUSION

Based on the results of research and development, the following conclusions can be drawn: (1) Development of Napkin Folding Learning Media through the define, design, develop, disseminate (4D) stage. Learning media in the form of interactive media containing Adobe Flash program with napkin folding material applied to basic catering courses; (2) The results of the feasibility test of the validation stage by media experts and material experts with criteria that meet the feasibility aspects; (3) The results of the field trial consisting of the results of one to one, small group, and field group trials, the media was declared feasible; (4) The results of the analysis of t count and t table state that the value of student learning outcomes using flash player-based interactive learning media on napkin folding material is greater than the learning outcomes of students using power point media. So it can be concluded that flash player-based interactive multimedia has a positive influence on its use.

REFERENCES

Abdulrahaman, M. D., Faruk, N., Oloyede, A. A., Surajudeen-Bakinde, N. T., Olawoyin, L. A., Mejabi, O. V., Imam-Fulani, Y. O., Fahm, A. O., & Azeez, A. L. (2020). Multimedia tools in the teaching and learning processes: A systematic review. *Heliyon*, *6*(11). https://doi.org/10.1016/j.heliyon.2020.e05312

Abu Talib, M., Bettayeb, A. M., & Omer, R. I. (2021). Analytical study on the impact of technology in higher education during the age of COVID-19: Systematic literature review. *Education and Information Technologies*, *26*(6), 6719–6746. https://doi.org/10.1007/s10639-021-10507-1

Akbarini, N. R., Murtini, W., & Rahmanto, A. N. (2018). Design of Interactive Learning Multimedia Development in General Administration Subject. *International Journal of Multicultural and Multireligious Understanding*, *5*(4), Article 4. https://doi.org/10.18415/ijmmu.v5i4.218

Akmal, N., Putri, Y. E., & Anugerah, A. I. (2022). Developing adobe animate-based interactive learning media of table manner for university students. *International Journal for Educational and Vocational Studies*, *4*(3), Article 3. https://doi.org/10.29103/ijevs.v4i3.9336

Alphonce, S., & Mwantimwa, K. (2019). Students' use of digital learning resources: Diversity, motivations and challenges. *Information and Learning Sciences*, *120*(11/12), 758–772. https://doi.org/10.1108/ILS-06-2019-0048

Ampera, D. (2017). *Adobe Flash CS6-Based Interactive Multimedia Development for Clothing Pattern Making*. 314–318. https://doi.org/10.2991/ictvt-17.2017.54

Arikunto, S. (2010). *Prosedur penelitian suatu pendekatan praktek* (Edisi revisi 4). Rineka Cipta. https://cir.nii.ac.jp/crid/1130000795354347648

Arnold, E., & Bell, M. (2001). Some new ideas about research for development. *Partnerships at the Leading Edge: A Danish Vision for Knowledge, Research and Development*, 279–319.

Asmarany, A. I., Mudriadi, W., Solissa, E. M., Sudadi, S., & Sudyana, I. N. (2023). Effectiveness Analysis of Students' Creative Thinking Skills Program by Optimizing The Development of Adobe Animate-Based Vlab Static Electricity Media. *Mudir: Jurnal Manajemen Pendidikan*, *5*(2), 392–397.

Azizah, A. N., Yulianti, Y., & Rusilanti, R. (2024). Pengembangan Video Pembelajaran American Service sebagai Sumber Belajar Mata Kuliah Penataan dan Pelayanan Restoran. *Journal of Comprehensive Science (JCS)*, *3*(7), 2352–2371. https://doi.org/10.59188/jcs.v3i7.805

Balakrishnan, V., & Gan, C. L. (2016). Students' learning styles and their effects on the use of social media technology for learning. *Telematics and Informatics*, *33*(3), 808–821. https://doi.org/10.1016/j.tele.2015.12.004

Beacham, N. A., & Alty, J. L. (2006). An investigation into the effects that digital media can have on the learning outcomes of individuals who have dyslexia. *Computers & Education*, *47*(1), 74–93. https://doi.org/10.1016/j.compedu.2004.10.006

Ben Ma. (2018). Animation Production Teaching Model based on Design-Oriented Learning. *International Journal of Emerging Technologies in Learning*, *13*(8), 172–184. https://doi.org/10.3991/ijet.v13i08.9049

Bulman, G., & Fairlie, R. W. (2016). Chapter 5 - Technology and Education: Computers, Software, and the Internet. In E. A. Hanushek, S. Machin, & L. Woessmann (Eds.), *Handbook of the Economics of Education* (Vol. 5, pp. 239–280). Elsevier. https://doi.org/10.1016/B978-0-444-63459-7.00005-1

Cairncross, S., & Mannion, M. (2001). Interactive Multimedia and Learning: Realizing the Benefits. *Innovations in Education and Teaching International*, *38*(2), 156–164. https://doi.org/10.1080/14703290110035428

Chun, R. (2012). *Adobe Flash Professional CS6 Classroom in a Book*. Adobe Press.

Damarwan, E. S., & Khairudin, M. (2017). *Development of an Interactive Learning Media to Improve Competencies*. 24–27. https://doi.org/10.2991/ictvt-17.2017.5

Darari, M. B. (2017). Penggunaan Media Adobe Flash Pada Pembelajaran Kesebangunan dalam Meningkatkan Kemampuan Pemecahan Masalah Matematika Siswa SMP Negeri 7 Medan. *JURNAL HANDAYANI PGSD FIP UNIMED*, *7*(2), Article 2. https://doi.org/10.24114/jh.v7i2.7233

Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving Students' Learning With Effective Learning Techniques: Promising Directions From Cognitive and Educational Psychology. *Psychological Science in the Public Interest*, *14*(1), 4–58. https://doi.org/10.1177/1529100612453266

Fandini, E. A. N., Siswandari, S., & Kristiani, K. (2021). The Impact of Adobe Flash Media on Increasing Students' Critical Thinking Ability. *International Journal of English Literature and Social Sciences*, *6*(5), 045–048.

Faruk, A. (2014). Development of interactive learning media based lectora inspire in discrete method course. *Proceeding of International Conference On Research, Implementation, And Education If Mathematics And Science UNY*. https://core.ac.uk/download/pdf/33509333.pdf

Fathoni, A., Prasodjo, B., Jhon, W., & Zulqadri, D. M. (2023). *Media dan Pendekatan Pembelajaran di Era Digital: Hakikat, Model Pengembangan & Inovasi Media Pembelajaran Digital*. Eureka Media Aksara. https://repository.penerbiteureka.com/id/publications/565174/

Febriati, F., H, N., & Dolla, A. A. (2022). Development of Adobe Flash-Based Multimedia in Learning Recognition of Parts of Human Body. *AL-ISHLAH: Jurnal Pendidikan*, *14*(3), Article 3. https://doi.org/10.35445/alishlah.v14i3.2126

Fridiarty, L., Putri, Y. E., Anugerah, A. I., & Waruwu, M. A. S. (2022). Development of website-based culinary art learning media in improving practical skills in the culinary arts study program. *International Journal for Educational and Vocational Studies*, *4*(3), Article 3. https://doi.org/10.29103/ijevs.v4i3.9337

García, R. R., Quirós, J. S., Santos, R. G., González, S. M., & Fernanz, S. M. (2007). Interactive multimedia animation with Macromedia Flash in Descriptive Geometry teaching. *Computers & Education*, *49*(3), 615–639. https://doi.org/10.1016/j.compedu.2005.11.005

Georgenes, C. (2012). *How to Cheat in Adobe Flash CS5: The Art of Design and Animation*. Routledge. https://doi.org/10.4324/9780240522081

Gerantabee, F., & Team, A. C. (2011). *Flash Professional CS5 Digital Classroom*. John Wiley & Sons.

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, *3*, 275–285. https://doi.org/10.1016/j.susoc.2022.05.004

Heldman, W. (2012). *Adobe Flash Professional CS6 Essentials*. John Wiley & Sons.

Hidayah, S., Wahyuni, S., & Ani, H. M. (2017). Penggunaan Media Pembelajaran Interaktif Dengan Aplikasi Adobe Flash Cs6 Untuk Meningkatkan Motivasi Belajar Pada Kompetensi Dasar Menganalisis Peran, Fungsi Dan Manfaat Pajak (Studi Kasus Siswa Kelas Xi Ips 1 Orang 1 Jember Semester Genap Tahun Ajaran 2016/2017). *JURNAL PENDIDIKAN EKONOMI: Jurnal Ilmiah Ilmu Pendidikan, Ilmu Ekonomi Dan Ilmu Sosial*, *11*(1), Article 1. https://doi.org/10.19184/jpe.v11i1.5012

Ingtyas, F. T., & Akmal, N. (2024). Development Of Macromedia Flash-Based Interactive Media In Food Ingredients Knowledge Subjects. *International Journal of Educational Research & Social Sciences*, *5*(3), Article 3. https://doi.org/10.51601/ijersc.v5i3.818

Irawan, R. (2021). Literature Study: Utilization of Android-Based Learning Media Using Adobe Flash CS 6 (As An Educational Solution During The Covid-19 Pandemic). *Journal of Physics: Conference Series*, *1940*(1), 012127. https://doi.org/10.1088/1742-6596/1940/1/012127

Islapirna, I., Fadhilah, Hendriyani, Y., & Wakhinuddin. (2023). Development of Interactive Learning Media in Computer Subjects and Basic Networks in Vocational High Schools. *JOURNAL OF INFORMATICS AND TELECOMMUNICATION ENGINEERING*, *6*(2), 579–586. https://doi.org/10.31289/jite.v6i2.8867

Lin, M.-H., Chen, H.-C., & Liu, K.-S. (2017). A Study of the Effects of Digital Learning on Learning Motivation and Learning Outcome. *Eurasia Journal of Mathematics, Science and Technology Education*, *13*(7), 3553–3564. https://doi.org/10.12973/eurasia.2017.00744a

Marlena, N., Dwijayanti, R., & Widayati, I. (2019). *Is Audio Visual Media Effective for Learning?* 260–264. https://doi.org/10.2991/icesshum-19.2019.42

Matore, M. E. E. M., Khairani, A. Z., Nor, M. M., & Radzi, N. M. M. (2018). Evaluating the Content Validity of IKBAR Using Content Validity Ratio Among Profesional Experts. *Advanced Science Letters*, *24*(7), 5316–5319. https://doi.org/10.1166/asl.2018.11725

Matta, H., & Gupta, R. (2021). Augmented Reality: An Upcoming Digital Marketing Tool in India. In P. K. Kapur, G. Singh, & S. Panwar (Eds.), *Advances in Interdisciplinary Research in Engineering and Business Management* (pp. 31–38). Springer Nature. https://doi.org/10.1007/978-981-16-0037-1_3

Menggo, S., Lon, Y. S., Widyawati, F., Yuliantari, A. P., & Rahim, R. (2021). *ICEHHA 2021: Proceedings of the 1st International Conference on Education, Humanities, Health and Agriculture, ICEHHA 2021, 3-4 June 2021, Ruteng, Flores, Indonesia.* European Alliance for Innovation.

Mishra, S., & Sharma, R. C. (2005). *Interactive Multimedia in Education and Training.* Idea Group Inc (IGI).

Muslim, S., Gitama, N. P., Suprianto, B., Rahmadyanti, E., & Kusumawati, N. (2018). Influence of learning media based on adobe flash professional to psychomotor domain learning outcomes on plc courses viewed from level of creative thinking student. *Jurnal Pendidikan Vokasi*, *8*(3), Article 3. https://doi.org/10.21831/jpv.v8i3.21552

Pernanda, D., Zaus, M. A., Wulansari, R., & Islami, S. (2018). Effectiveness of instructional media based on interactive cd learning on basic network at vocational high school: Improving student cognitive ability. *International Conferences on Educational, Social Sciences and Technology*, 443–447. https://doi.org/10.29210/2018163

Rahim, F. R., Sari, S. Y., Sundari, P. D., Aulia, F., & Fauza, N. (2022). Interactive design of physics learning media: The role of teachers and students in a teaching innovation. *Journal of Physics: Conference Series*, *2309*(1), 012075. https://doi.org/10.1088/1742-6596/2309/1/012075

Rahmawati, I. (2021). Peningkatan Kemampuan Menulis Teks Narasi Bahasa Inggris Melalui Media Gambar Berseri Pada Siswa Kelas X MIPA 3 SMA Negeri 6 Semarang. *Jurnal Pendidikan Sultan Agung*, *1*(2), Article 2. https://doi.org/10.30659/jp-sa.v1i2.15626

Reimers, S., & Stewart, N. (2007). Adobe Flash as a medium for online experimentation: A test of reaction time measurement capabilities. *Behavior Research Methods*, *39*(3), 365–370. https://doi.org/10.3758/BF03193004

Richey, R. C., & Klein, J. D. (2014). *Design and development research: Methods, strategies, and issues*. Routledge. https://www.taylorfrancis.com/books/mono/10.4324/9780203826034/design-development-research-rita-richey-james-klein

Riyadi, S., Doewes, R. I., & Gontara, S. Y. (2020). The value of Adobe Flash Player media in the learning of football skills. *ISS*, 10.

Romero Jeldres, M., Díaz Costa, E., & Faouzi Nadim, T. (2023). A review of Lawshe's method for calculating content validity in the social sciences. *Frontiers in Education*, *8*. https://doi.org/10.3389/feduc.2023.1271335

Schneider, K. P., Fuller, J. C., Tuffner, F. K., & Singh, R. (2010). *Evaluation of conservation voltage reduction (CVR) on a national level*. Pacific Northwest National Lab.(PNNL), Richland, WA (United States). https://www.osti.gov/biblio/990131

Shrotryia, V. K., & Dhanda, U. (2019). Content Validity of Assessment Instrument for Employee Engagement. *Sage Open*, *9*(1), 2158244018821751. https://doi.org/10.1177/2158244018821751

Siburian, S., Hutagalung, S. M., & Daulay, S. (2020). Development of Adobe Flash CS6 Learning Media in Short Story-Based on Learning Text of Advanced Local Community of Batak Toba Students in Tanjungmorawa. *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal*, *3*(1), Article 1. https://doi.org/10.33258/birle.v3i1.855

Sikumbang, S. P. (2022). *Pengembangan Media Pembelajaran Multimedia Interaktif Materi Tipe Pelayanan Room Service* [Doctoral, UNIVERSITAS NEGERI JAKARTA]. http://repository.unj.ac.id/32369/

Sudarsana, I. K., Arini, N. W., Mastini, G. N., Sukerni, N. M., & Pusparini, L. D. (n.d.). *Learning Media: The Development and Its Utilization*. Yayasan Ahmar Cendekia Indonesia.

Suyitno, S., Purwoko, R. Y., Widiyono, Y., Jatmoko, D., Nurtanto, M., & Hassan, Z. (2020). Development of learning media for automotive charging system based on macromedia flash vocational school. *Universal Journal of Educational Research*, *8*(11), 64–71.

Syafruddin, S., Lestari, I. D., Noviati, W., & Ramdhayani, E. (2021). *Development of Learning Media for Educational Games Based on Adobe Flash in Biology*. 107–111. https://doi.org/10.2991/assehr.k.210525.056

Thompson, P. (2013). The digital natives as learners: Technology use patterns and approaches to learning. *Computers & Education*, *65*, 12–33. https://doi.org/10.1016/j.compedu.2012.12.022

Trianto. (2024). *Model Pembelajaran Terpadu: Konsep, Strategi, dan Implementasinya dalam Kurikulum Tingkat Satuan Pendidikan (KTSP)*. Bumi Aksara.

Ulgari, S., Firdaus, F., Nursanni, B., & Yulia, E. (2023, May 3). *Feasibility and Effectiveness of Interactive Multimedia Courses of Occupational Safety and Health Assisted with Macromedia Flash Software*. Proceedings of the 4th Annual Conference of Engineering and Implementation on Vocational Education, ACEIVE 2022, 20 October 2022, Medan, North Sumatra, Indonesia. https://eudl.eu/doi/10.4108/eai.20-10-2022.2328881

Umarova, Z. (2020). Pedagogical Opportunities of Media Resources in a Digital Media Educational Environment. *Journal La Edusci*, *1*(5), Article 5. https://doi.org/10.37899/journallaedusci.v1i5.252

Windiartha, A., Kristiyanto, A., & Purnama, S. K. (2017). The Develompment of Media Based on Adobe Flash Player in Training Basic Technique of Futsal. *Journal of Physical Education Health and Sport*, *4*(2), Article 2. https://doi.org/10.15294/jpehs.v4i2.11118

Yenni, Y., Syamswisna, S., & Marlina, R. (2018). Pengaruh Media Pembelajaran Audiovisual Terhadap Hasil Belajar Siswa Materi Sel Kelas XI MIA SMA. *Jurnal Pendidikan Dan Pembelajaran Khatulistiwa (JPPK)*, *7*(9), Article 9. https://doi.org/10.26418/jppk.v7i9.27915