



Developing 3D Animated Videos Using The Plotagon Story Application to Improve Arabic Listening Skills

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ENGLISH ABSTRACT

This research aimed to develop 3D animated videos using the Plotagon story application as a learning media for Arabic listening skills, test the effectiveness of the 3D animated videos developed to increase students' interest and improve their Arabic listening skills. This research used Hannafin and Peck's research and development model modified based on research needs. Research instruments included interviews, questionnaires, and tests. Data analysis techniques used were quantitative descriptive, one-sample t-test, and independent-sample t-test. The research results explained that the quality of the material and media of the 3D animated video developed using the Plotagon story application was very good. The video is effective in increasing students' interest in learning Arabic listening skills. Additionally, it helps them improve their Arabic listening abilities. It is possible to conclude that the production of multimodal input-based learning media using the Plotagon Story application can help students gain Arabic listening skills.

Keywords: 3D Animation Videos, Arabic Listening Skills, Plotagon Story Application

INDONESIAN ABSTRACT

Penelitian ini bertujuan untuk mengembangkan video animasi 3D dengan menggunakan aplikasi cerita plotagon sebagai media pembelajaran keterampilan menyimak bahasa Arab, menguji keefektifan video animasi 3D yang dikembangkan untuk meningkatkan minat siswa, serta menguji keefektifannya untuk meningkatkan keterampilan menyimak bahasa Arab. Penelitian ini menggunakan model penelitian dan pengembangan Hannafin dan Peck yang dimodifikasi berdasarkan kebutuhan penelitian. Instrumen penelitian meliputi wawancara, angket, dan tes. Teknik analisis data menggunakan deskriptif kuantitatif, uji t satu sampel, dan uji t sampel independen. Hasil penelitian menjelaskan bahwa kualitas materi dan media video animasi 3D yang dikembangkan menggunakan aplikasi plotagon story sangat baik. Video animasi 3D yang dikembangkan efektif meningkatkan minat siswa dalam pembelajaran keterampilan mendengarkan bahasa Arab. Dan video animasi 3D yang dikembangkan efektif meningkatkan keterampilan menyimak bahasa Arab (maharah istima') siswa. Dapat disimpulkan bahwa pengembangan media pembelajaran berbasis input multimodal untuk menunjang pembelajaran keterampilan menyimak bahasa Arab perlu dilakukan dengan aplikasi cerita plotagon.

Kata Kunci: *Video Animasi 3D, Kemahiran Menyimak Bahasa Arab, Aplikasi Plotagon Story*

Introduction

Listening is an important part of the major skill in language learning, but listening is also one part that is not always taught well by teachers. Listening is categorized as the least understood and least researched skill among the four other language skills, including speaking, reading, and writing (Vandergrift, 2007). Meanwhile, learning media in teaching listening used in conventional foreign language (FL) classes, where students tend to listen to audio material provided with an audio player that includes a textbook and passively receive instruction from the teacher, fails to increase student learning motivation or improve their listening comprehension.

The problems described previously can be solved by using images and videos to support text-based materials, such as transcripts of spoken texts or articles, to improve students' listening comprehension stages (Carpenter and Olson, 2012; Jiang, 2016). This explanation is based on the belief that the use of multimodal input allows the creation of an authentic environment to enhance foreign language (FL) learning (Richard E. Mayer, 2005). Jiang (2016) added that students' listening performance was poorer when they studied using conventional learning media, compared to those who studied using multimodal or multimedia learning media. The use of multimodal or multimedia learning media input such as descriptions or line drawings accompanied by text-based

material has been believed to have benefits for learning (Carpenter and Olson, 2012; Kholis et al., 2023; Wilberschied and Berman, 2004), but the results of the teaching are not always satisfactory. So that the use of descriptions that provide information that complements the audio part of the material (Ginther, 2002) and is not distracting (Jiang, 2016) is a requirement for creating satisfactory teaching results.

Learning media to improve listening comprehension is needed to enable students to acquire types of listening comprehension abilities in real-world contexts. In recent years, advanced 3D animated video technologies such as Plotagon Story as a 3D animated video software, have been utilized in language classes because they can integrate various types of multimodal information and provide a nearly authentic learning environment for foreign language learners (Alwasilah, 2019; Guzmán Gámez and Moreno Cuellar, 2019).

Plotagon as 3D animation software is one of the advanced technologies that attracts the attention of researchers and educators and its potential for foreign language (FL) mastery has been proven (Al-Khalidi, Omaima, and Al-Sabah, 2022; Alwasilah, 2019; Rudiamon, 2022). This happens because Plotagon as 3D animation software does not only involve images, videos, animations, music, symbols, and others, all of which are elements found in authentic contexts, but also it creates a visual context in which learners can experience authentic context. However, most studies on learning Arabic through animated videos focus on oral communication (Rudiamon, 2022), written communication (Alwasilah, 2019), or effective construction (Al-Khalidi et al., 2022), while only a few studies focus on listening skills. Based on this problem, therefore, this research aims to develop 3D animated videos by utilizing the Plotagon Story for learning Arabic listening skills and investigate the effect of its use on students' listening comprehension of Arabic as a foreign language (AFL) and their learning preferences towards the 3D animated video developed.

Methods

The research design used in this study was Research and Development. The development model chosen was the Hannafin and Peck (1988) development model which was modified according to research needs, where the development model has four stages consisting of the needs analysis stage, the design and construction stage, and

the development and implementation stages. Researchers added an evaluation stage by including effectiveness testing of the media.

The need analysis stage utilizes quantitative and qualitative data. Quantitative data was obtained through questionnaire and qualitative data was obtained by interviews regarding the implementation of the media. The results are then used as a reference for the design and development stages. Based on the need analysis, the researcher designed the learning media of Arabic listening class in the form of 3D animated videos using the Plotagon Story application. The media was then being tested for its suitability by several experts including material and media experts. Next stage was testing the effectiveness of the learning media developed in the previous stage by comparing the learning outcomes of the experimental group and the control group.

The research subjects in this study were first-year students in four Arabic language classes. Two classes are from the English Language Education (PBI) department and the rest are from the Early Childhood Education (PIAUD) department. The four classes were further divided into experimental groups (two classes) and control groups (two classes). The experimental group consisted of PIAUD 1A (N=27) and PBI 1B (N=34). Meanwhile, the control group consisted of PIAUD 1B (N=26) and PBI 1C (N=34). The selection of participants was carried out by purposive sampling. The validator for material experts was selected from Arabic language lecturers at the Faculty of Education at UIN Walisongo Semarang. Meanwhile, validators for media experts were selected from several learning media lecturers at the Faculty of Education UIN Walisongo Semarang.

Research Instrument

This research used three types of instruments, they are interview guides, questionnaires, and tests. An interview guide was used to obtain qualitative data regarding students' needs of media in learning listening. The questionnaire was used to obtain quantitative data regarding students' interests. Meanwhile, the test was used to obtain data regarding the effectiveness of the 3D videos.

Data Analysis Technique

The data obtained from the experts were analyzed by calculating the average of their assessments regarding a 3D animated video developed using the Plotagon Story

Application. Then, the data obtained from students regarding their interest in the use of 3D videos in their learning were analyzed using a one-sample t-test. Meanwhile, the data collected from the test were analyzed using an independent sample t-test to test the effectiveness of teaching using the new media in increasing students' Arabic listening skills.

Development Procedure

The procedure for developing learning media for Arabic listening skills consisted of four main stages. The need analysis stage included several activities. The first was teacher analysis. The second was material analysis. The next stage was an analysis of student needs. The design stages carried out for early-stage product development include several activities. The first was making a storyboard and the second was determining materials to be put into 3D animated video media by animators. The development and implementation phase included several activities. The first was the production of 3D animated videos by animators. Second was production improvements by animators. Third was validation from material and media experts. Fourth was product revision by the animator. Next was the implementation of the video which had been determined. The researchers then distributed the questionnaires to the students to determine their interest in the implementation of the video. The last stage was testing their listening skills after implementing 3D animated videos in learning. The evaluation stage included several activities beginning with analyzing student interest regarding the implementation of 3D animated videos in learning and then analyzing their Arabic listening skills after learning.

Technology-Assisted Listening Skills

Listening skills are an important part of language skills which are the foundation of other language skills (Gilakjani and Sabouri, 2016). The active language input process is carried out by listening. This suggests that receiving information and understanding meaning is done through a complex and active process, listening. (O'Malley, Chamot, and Küpper, 1989) Listeners' failure to understand the information they receive occurs when they do not utilize all the resources available to understand meaning (Vandergrift, 2007). According to Anderson and Lynch (1988), these resources include background knowledge, knowledge of the context, and knowledge of the language system. Context

knowledge includes location, time, and person, all of which relate to the listening material. Knowledge of the listening context is categorized as an index of the difficulty of the listening material. Listening to material that is related to students' authentic experiences makes it easier for students to understand the material (Prabhu, 1987), on the other hand; a lack of contextual information causes students' weak understanding of listening material (Goh, 2000). Visual media can be used as a supporting tool to provide or convey contextual information that students need and to improve listening comprehension (Jones, 2003; Michael Rost, 2013; Yeldham, 2016). Wilberschied and Berman (2004) explained that images that have transcripts in the form of written words and sentences enable young and less language-proficient students to understand TV broadcasts in a second (SL) or foreign (FL) language.

Advanced and multimodal media, which are technological advances in recent years, have been included in the listening process to enable listeners to enhance their listening comprehension through contextual cues (Cross, 2011) Many studies reported that multimodal media has a significant influence on second language (SL) or foreign (FL) Listening (Aldera, 2015; Keguruan dan Ilmu Pendidikan, Arfazul Ilmi, and Novita Dewi, 2022; Tao, Luo, and Zhao, 2017). For example, Ilmi and Dewi (Keguruan dan Ilmu Pendidikan et al., 2022) investigated English as a foreign language (EFL) learners' perceptions of the integration of multimodal information into English as a foreign language (EFL) classroom practices and reported that integrating multimodal information in the EFL learning process increased students' interest and engagement. Meanwhile, Tao, Luo and Zhao (Tao et al., 2017) examined how multimodal information influences EFL students' listening comprehension, and modality congruence influences students' listening comprehension, especially when the visual modality matches the audio modality information.

Most studies reporting the effectiveness of multimodal media to improve foreign language (FL) listening comprehension focus on English as a foreign language (EFL), not Arabic as a foreign language (AFL). Meanwhile, the use of authentic video contexts for foreign language (FL) students, especially Arabic language (AFL) students, has been less widely explored compared to research that explores images and videos as visual media. Due to the absence of research literature that focuses on authentic multimodal media for

the listening comprehension of Arabic as a foreign language (AFL) learners, further research on this topic is urgently needed.

Development of Learning Media of Arabic Listening Skills Using Plotagon Story Application

Learning media is expected to be able to support students' cognitive and affection processes (Asrori and Hasanudin, 2015) because it has a role in creating an atmosphere, situation, or conditions, and a learning environment that is favorable for teaching (Azhar Arsyad, 2019) and influence the formation of students' knowledge (Putia, Suryani, and Setiawan, 2018). Nowadays, technology-based learning media have been widely developed (Al-Khalidi et al., 2022; Alwasilah, 2019; Amalia, 2017). Software applications can be used to develop technology-based learning media (Rudiamon, 2022), one of which is by utilizing the Plotagon application (Alwasilah, 2019), which is 3D animation video software that has been used as a kind of audio-visual material (Al-Khalidi et al., 2022). Considering that learning through animation has several characteristics including fun, innovative, integrative, imaginative, and visual context, this has attracted the attention of foreign language (FL) student (Amal, Bire, and Suek, 2023; Amalia, 2017; Praveen and Srinivasan, 2022). The fun, innovative, integrative, imaginative, and visual context of animated videos has been proven to be beneficial for students learning motivation (Amal et al., 2023; Makfiro, Thooyibah, and Mauludiyah, 2022) listening skills (Amal et al., 2023; Amalia, 2017) and speaking skills (Amalia, 2017).

Plotagon Story as software for creating 3D animated stories allows users to write their own stories and edit their cartoon animations according to their needs (Salma, Machmudah, and Nurhidayati, 2022). According to Thohir et al, (2021) Plotagon story allows users to present 3D shapes by adding variations of characters, sounds, and settings according to their needs to make animated stories more interesting. Meanwhile, Mudinillah, Nurfadilah, and Rudiamon (2022) reported that using the Plotagon Story application had a positive influence on students' enthusiasm for learning Arabic language skills.

Given that Arabic is considered one of the most difficult languages to learn (Mustafawi et al., 2022), 3D animated video learning can improve the learning of Arabic as a second (ASL) / foreign language (AFL) as well as other foreign languages such as

English (Guzmán Gámez and Moreno Cuellar, 2019), and Spanish (Wehner, Gump, and Downey, 2011). Relevant studies on 3D animated video learning for learning Arabic as a second/foreign language (ASL/AFL) mainly focus on its positive influence on learner affect, such as motivation, anxiety, or perception (Al-Khalidi et al., 2022). Nowadays, more and more relevant research is emerging that focuses on the impact of learning 3D animated videos with the Plotagon application on the language skills of Arabic as a foreign language (AFL) learners, such as speaking ability (Aulia 2023; Rudiamon 2022), writing ability (Alwasilah, 2019) or affection of Arabic as a foreign language (AFL) learners (Makfiro et al., 2022; Rudiamon, 2022).

Regarding Arabic communication skills, oral and written-based communication and vocabulary are the most investigated skills. Mudinillah, Nurfadilah, and Rudiamon, (2022) conducted research to investigate how 3D animated videos influence the oral communication of Arabic as a foreign language (AFL) students. They found that students were greatly helped in learning Arabic. They experienced significant improvements in their speaking skills when they worked on Arabic language assignments. Apart from oral communication skills, listening learning by Arabic as a foreign language (AFL) students benefit from independent learning by learning 3D animation videos based on Plotagon Story (Rudiamon, 2022). Meanwhile, in research by Makfiro, Thooyibah, & Mauludiyah (2022), reported that the use of 3D animated videos increased the enthusiasm and motivation of Arabic as a foreign language (AFL) students. The research shows that 3D animation video learning is beneficial for Arabic as a foreign language (AFL) students.

Although many studies relevant or related to the acquisition of Arabic language skills through learning animated videos have been conducted, only a few studies have focused on the effects of learning Arabic on listening comprehension of Arabic as a second/foreign language (ASL/AFL). Considering that several studies using multimodal for listening comprehension of Arabic as a second/foreign language (ASL/AFL) have been developed, this research aims to develop 3D animated video learning media with Plotagon Story to improve listening comprehension and find new empirical evidence to expand Authentic multimodal comprehension for listening comprehension To achieve these objectives, three research questions were addressed in this study: 1) What are the stages of developing 3d animated videos using plotagon story application as learning media of Arabic listening skills for UIN Walisongo Semarang students?. 2) To what

extent are the 3D animated videos developed using the Plotagon Story application effective in increasing the UIN Walisongo Semarang students' interest in learning Arabic listening skills?. 3) Are the 3d animated videos developed using the Plotagon Story application effective in improving UIN Walisongo Semarang students' Arabic listening skills?

What Are the Stages of Developing 3D Animated Videos Using Plotagon Story as Learning Media of Arabic Listening Skills for UIN Walisongo Semarang Students?

Research and development of learning media for Arabic listening skills has been carried out based on development steps using the Hannafin and Peck (1988) (Michael J and Kyle L, 1988) development model consists of three stages which are described as follows:

Need Analysis Stage

This stage was carried out to obtain information to be used as consideration in developing learning media with the Plotagon Story Application to increase students' interest and ability regarding Arabic listening skills This analysis includes teacher analysis, syllabus analysis, and students' need analysis.

Instructor Analysis

Interview results show that the majority of Arabic language teachers use conventional learning methods, such as online or offline lectures, discussions and presentations. Commonly used learning media are textbooks, power boards, and whiteboards. However, teachers find that learning media does not support their teaching process and also find it difficult to facilitate students' independent learning. Arabic listening skills material is categorized as complex material to teach. Arabic listening skills require complex modalities to fulfill students' multimodality (Tao et al., 2017) in learning Arabic language skills Apart from that, students tend to be passive, experiencing obstacles in the process of learning Arabic listening skills and difficulties related to learning independence. Supporting the affective process is a challenge in itself in learning to listen to Arabic, apart from the cognitive process of listening to Arabic. Therefore, these two things encouraged the development of learning media. That can increase student interest to play an active role in learning. The learning media developed is also expected to be able to facilitate learning that is interesting, contextual,

authentic, and meets students' multimodality. Besides, the learning media does not only provide animation but also provides material that suits students' needs.

Material Analysis

The analysis indicated that Arabic language teachers experienced difficulties in providing students with learning media that is interesting and suitable for their needs. Arabic listening skills material requires interesting learning media, offers real experiences, and authentic contexts (Prabhu, 1987), and facilitates student multimodality, not just focusing on audio or visuals. The material is based on the *Syamil* textbook published by the Language Development Center of the Walisongo State Islamic University, Semarang. Thus, the development of learning media that refers to the *Syamil* textbook needs to be carried out.

Student Need Analysis

The student needs questionnaire given to PIAUD 1A and PBI 1B students is was given directly or offline. The results obtained show that almost 100% of students have smart phones and the frequency of using them is very high. Around 70% of students think that the explanation given by the teacher did not help students understand the Arabic listening material. They think that the use of multimedia enables them to become interested in learning. Most students (78%) were interested in learning to listen using multimedia, which in this research is 3D animated videos developed using the Plotagon Story application.

The previous explanation indicates that the learning media used are still conventional because they have not been able to optimally facilitate teachers in learning listening. Learning media also tends to be monotonous and unable to make students interested. Apart from that, learning media were also not able to facilitate multimodality and support students' affection and cognition processes. So, the media are needed to facilitate students' multimodality and support their interest in improving their Arabic listening skills.

Design Stage

The design stage was an advanced stage of the need analysis stage, where the media was designed using the Plotagon Story. This stage includes several activities that must be carried out. The first was creating create a Storyboard. Second, search

determining materials to be designed into an animated video. Storyboards are sketches of images designed sequentially based on a storyline, where storyboards can enable story ideas to be easily conveyed and the 3D animated video design being developed. Meanwhile, the main element in the 3D animation video is the *Khiwar* material in chapter 1 of the PPB UIN Walisongo Semarang's *Syamil* book. Processing animated videos as learning media based on these main materials includes several steps.

The first is to choose a scene, namely the conversation (*khiwar*) between Muhammad and Ibrahim.

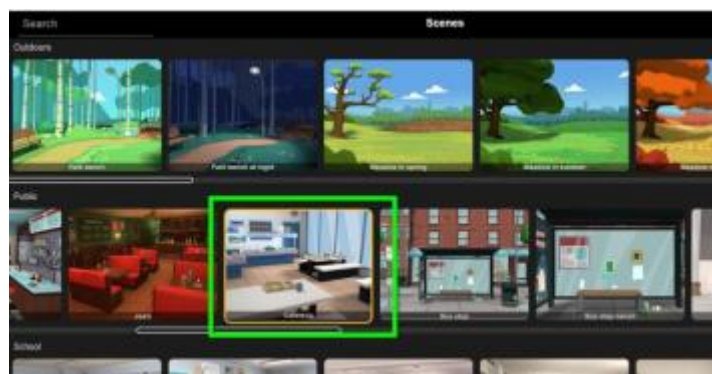


Figure 1. Cafeteria public space

The second is setting the video storyline, namely selecting characters according to the animated video storyline. This step allows the customization of animated characters based on skin color, age, and so on. Selecting facial characters can be done by clicking on the create character section, and then selecting the features in the Plotagon application.



Figure 2. Creating a new character

After the character features panel appears, the shape of the face, clothes, pants, and shoes can be adjusted by clicking on the icon on the panel.

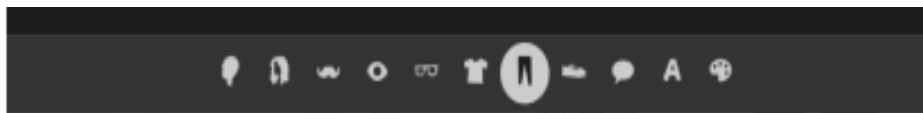


Figure 3. Plotagon Story character feature icons

Repeat the previous steps to create the character Ibrahim.



Figure 4. Results of character feature settings

After all the animated video characters are finished, on the right there is a choice of character positions in the selected scene. The scene setting this time is in the cafeteria, so it fits Muhammad and Ibrohim's position.

Next, to start a conversation, click the message icon at the bottom. Then select the video character who will speak in that part. In this message panel, the user can start an audio recording that will be input to the selected character.

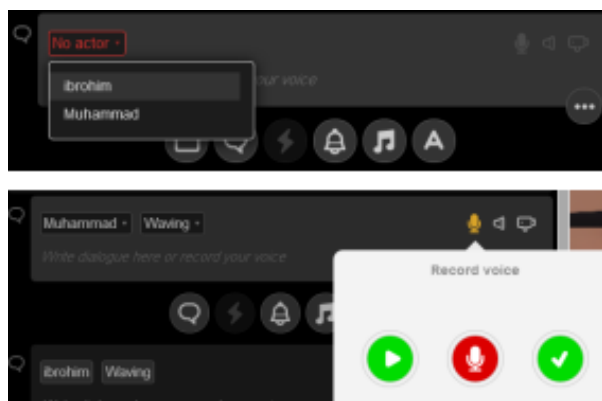


Figure 5. inserting conversation audio

Follow the two steps above until the entire material text has been inserted into the animated video in audio form.



Figure 6. selecting the Movement feature on Plotagon

The main element in the 3D animation video is the conversation (*khiwar*) material in chapter 1 of the PPB UIN Walisongo Semarang *syamil* book.

Development Stages

The development stages in this research include several stages. An explanation of the development stages is as follows:

Material Expert Assessment

Material expert assessment is a stage used to assess whether the material of 3D animated videos developed using the Plotagon Story application is in accordance with the material taught in learning Arabic listening skills for UIN Walisongo Semarang students. The results were explained as follows:

Table 1. Material Expert Assessment

Aspect	Score	Percentage	Category
Material	4.00	80	Good
Suitability	4.67	93.33	Very good
Use	4.13	82.5	Good
Average	4.26	85.28	Very Good

The validation results by material experts cover three aspects, namely material aspects, suitability aspects, and usage aspects. The material aspect received an average score of 4.00 with a percentage of 80% and was categorized as good, where the assessment consisted of three indicators. The suitability aspect received an average score of 4.67 with a percentage of 93.33% and was categorized as very good, where the assessment consisted of three indicators. Meanwhile, the usage aspect received an average score of 4.13 with a percentage of 82.5% and was categorized as good, where the assessment consisted of four indicators. Overall, the material quality of 3D animated videos developed using the Plotagon Story application received an average score of 4.26 with a percentage of 85.28% and was categorized as very good.

Media Expert Assessment

Media expert assessment is a stage used to assess the suitability of 3D animated videos developed with the Plotagon Story application to be used as learning media of Arabic listening skills. The results of the analysis regarding the assessment of media experts regarding the suitability of 3D animated videos developed using the Plotagon Story application can be explained as follows:

Table 2. Media Expert Assessment

Aspect	Score	Percentage	Category
Attractiveness	4.50	90	Very Good
Appearance	4.50	90	Very good
Ease of use	4.50	90	Very Good
Multimodality	4.88	97.5	Very Good
Average	4.59	91.88	Very Good

The validation results by media experts cover four aspects, namely attractiveness, appearance, ease of use and multimodality. The attractiveness aspect received an average score of 4.50 with a percentage of 90% and was categorized as very good, where the assessment consists of three indicators. The appearance aspect gets an average score of 4.50 with a percentage of 90% and is categorized as very good, where the assessment consists of three indicators. The ease-of-use aspect received an average score of 4.50 with a percentage of 90% and was categorized as very good, where the assessment consisted of two indicators. The multimodality aspect obtained an average score of 4.88 with a percentage of 97.5% and was categorized as very good, where the assessment consists of four indicators. Overall, the 3D animated video developed using the Plotagon Story application based on media quality obtained an average score of 4.59 with a percentage of 91.88% and was categorized as very good.

Implementation Stage

The implementation of 3D animation videos developed using the Plotagon Story application is tested in two randomly selected classes, namely PIAUD 1A and PBI 1B classes. Furthermore, these two classes are called the control group. The implementation of 3D animated videos as a learning medium for Arabic listening skills was carried out over four meetings. At the end of this implementation stage, students who were in the control group were allowed to provide their assessments regarding the

videos. They were also given a test to determine their learning results after using the videos. These two data are then processed and presented in a discussion.

To What Extent Are the 3D Animated Videos Developed Using the Plotagon Story Application Effective in Increasing UIN Walisongo Semarang Students' Interest in Learning Arabic Listening Skills?

Analysis related to this is divided into two, namely data normality test, and difference test. Normality test using post-test scores is intended to fulfill the prerequisites for parametric statistical tests. The statistical hypothesis of data normality is as follows:

H_0 = Data follow a normal distribution

H_a = Data do not follow a normal distribution

Table 3. Normality Test of Experimental Group Data

Class	Shapiro-Wilk		
	Statistic	df	Sig
Experiment	.965	61	.074

The normality results of the PBI 1B experimental pre-test data are shown in Table 3, where the table reports that the Shapiro-Wilk sig value = 0.074 is greater than 0.05. This shows that the distribution of experimental data meets the normality assumption. The Shapiro-Wilk test was chosen because the sample was less than 100. It can be concluded that these two data meet the requirements for further parametric statistical tests.

Hypothesis testing was carried out to find out whether the videos were effective in increasing students' interest in learning Arabic listening. The test uses the t-test formula (one sample t-test) with the following hypothesis:

$$H_0 = \mu_1 \leq 75$$

$$H_a = \mu_1 > 75$$

Table 4. Result of One-Sample T-Test

Class	Score	\bar{X}	σ (SD)	σ^2 (Var)	Df	t_{count}	t_{table}
Experiment	4948	81.11	4.47	19.94	60	10.70	2.66

Table 4 shows that t_{count} is in the H_0 rejection area. This can be concluded that there is a difference in the average interest between the experiment and the minimum

criteria (75). Obtained $t_{count} = 10.70$ and $t_{(0.05;60)} = 2,66$. Because of $t_{count} = 10.70 > t_{(0.05;60)} = 2,66$, H_0 is rejected or H_a is accepted. This shows that the 3D animated videos are effective in increasing students' interest in learning Arabic listening skills. The videos are able to integrate multimodal information and authentic learning environments (Alwasilah, 2019; Guzmán Gámez and Moreno Cuellar, 2019) so that this helps effective construction (Al-Khalidi et al., 2022), such as student interest in learning.

Are the 3D Animated Videos Effective in Improving Students' Arabic Listening Skills?

The third research question discusses whether the 3D animated videos are effective in improving students' Arabic listening skills. The analysis was divided into three parts which include data normality testing, data homogeneity testing and hypothesis testing.

The test group's normality test using post-test test scores is intended to fulfill the prerequisites for parametric statistical tests. The statistical hypothesis of data normality is as follows:

H_0 = Data follows a normal distribution

H_a = Data do not follow a normal distribution

Table 5. Normality Test Results of PBI 1B and PBI 1C Data

Class	Kolmogorov-Smirnov		
	Statistic	df	Sig
Experiment PBI 1B	.145	34	.067
Control PBI 1C	.135	34	.123

The normality results of the PBI 1B experimental data are shown in table 5, where the table reports that the Kolmogorov-Smirnov sig value = 0.067 is greater than 0.05. This shows that the distribution of the PBI 1B experimental data meets the normality assumption. Then, the normality results of the PBI 1C control group data displayed in the table show that the Kolmogorov-Smirnov sig value = 0.123 is greater than 0.05. This shows that the PBI 1C data distribution meets the normality assumption. It can be concluded that these two data meet the requirements for further parametric statistical tests.

Table 6. Normality Test Results of PIAUD 1 and PIAUD 1B Data

Class	Kolmogorov-Smirnov		
	Statistic	df	Sig
Experiment PIAUD 1A	.161	27	.072
Control PIAUD 1B	.154	26	.116

The normality results of the PIAUD 1A experimental group data shown in table 6 report that the Kolmogorov-Smirnov sig value = 0.072 is greater than 0.05. This shows that the distribution of pre-test data for the PIAUD 1A experimental group meets the normality assumption. Then, the normality results of the PIAUD 1B control group data displayed in the table report that the Kolmogorov-Smirnov sig value = 0.116 is greater than 0.05. This shows that the data distribution for the PIAUD 1B control group meets the normality assumption. It can be concluded that these two data fulfill the requirements for further parametric statistical tests.

After the data normality test was carried out, the data from the two pairs of classes was then tested for its homogeneity. This aims to determine whether pairs of data have the same variance or not. The statistical hypothesis of the homogeneity test is as follows:

$$H_0: \sigma_1^2 = \sigma_2^2$$

$$H_a: \sigma_1^2 \neq \sigma_2^2$$

The test used is the F test, the test criteria are if $F_{\text{count}} < F_{\text{table}}$ then H_0 is accepted with a significance level of 5%. The results of the homogeneity test calculation are as follows:

Table 7. Results of Homogeneity Tests for PBI 1B and PBI 1C

Class	Score	\bar{X}	σ^2 (Var)	N	F_{count}	F_{table}
PBI 1B	257	7.56	2.254	34	1.00	2.38
PBI 1C	217	6.38	2.243	34		

Table 7 reports that F_{count} for both samples (1.00) is smaller than F_{table} (2.38) so H_0 is accepted. This means that both samples have the same variance or both classes are homogeneous.

Table 8. Results of Homogeneity Tests for PIAUD 1A and PIAUD 1B

Class	Score	\bar{X}	σ^2 (Var)	N	F_{count}	F_{table}
PIAUD 1A	202	7.48	2.028	27	1.41	2.38
PIAUD 1B	156	5.78	1.44	26		

Table 8 reports that F_{count} for both samples (1.41) is smaller than F_{table} (2.38) so H_0 is accepted. This means that both samples have the same variance or both classes are homogeneous.

Hypothesis testing was carried out to find out whether the 3D animated video developed using the plotagon story application was effective in increasing UIN Walisongo Semarang students' Arabic listening skills. The test uses the t-test formula (independent sample t-test) with the following hypothesis:

$$H_0 : \mu_1 \leq \mu_2$$

$$H_a : \mu_1 > \mu_2$$

Table 9. Results of Mean Difference of PBI 1B and PBI 1C

Class	Score	\bar{X}	σ (SD)	σ^2 (Var)	df	t_{count}	t_{table}
PBI 1B	257	7.56	1.501	2.254	66	3.902	2.66
PBI 1C	217	6.38	1.498	2.243			

Table 9 shows that t_{count} is in the H_0 rejection area. This can be concluded that there is a difference in the means of the two groups. It is obtained $t_{count} = 21.906$ and $t_{(0,05;66)} = 2.66$. Because $t_{count} = 3.902 > t_{(0,05;66)} = 2.38$ then H_0 is rejected or H_a is accepted. This shows that the Arabic listening skills of PBI 1B students (experimental group) are better than the Arabic listening skills of PBI 1C students (control group). The statistical calculation results of the mean difference test show that the 3D animation videos developed using the Plotagon story application are effective in improving UIN Walisongo Semarang students' Arabic listening skills.

Table 10. Results of Mean Difference of PIAUD 1A and PIAUD 1B

Class	Score	\bar{X}	σ (SD)	σ^2 (Var)	df	t_{count}	t_{table}
PIAUD 1A	202	7.48	1.42	2.028	51	4.821	2.66
PIAUD 1B	156	5.78	1.20	1.440			

Table 10 shows that t_{count} is in the H_0 rejection area. This can be concluded that there is a difference in the means of the two groups. It is obtained $t_{count} = 4.821$ and $t_{(0,05;51)} = 2.66$. Because of $t_{count} = 4.821 > t_{(0,05;51)} = 2.66$, H_0 is rejected or H_a is accepted. This shows that the Arabic listening skills of PIAUD 1A students (experimental group) are better than the Arabic listening skills of PIAUD 1B students (control group). The statistical calculation results of the mean difference test show that the videos are effective in improving their Arabic listening skills. Multimodal input such as developed

3D animated videos enable the creation of authentic environments and provide multimodal information (Carpenter and Olson, 2012; Wilberschied and Berman, 2004) to improve foreign language proficiency (Richard E. Mayer, 2005) and listening proficiency (Carpenter and Olson, 2012; Jiang, 2016), such as Arabic listening skills.

Conclusion

The development of multimodal input-based learning media to support learning Arabic listening skills needs to be done by utilizing existing technology. The 3D animated videos developed using the Plotagon Story application as learning media have very good quality material and media. This media is effective in increasing students' interest as well as improving their skills in learning Arabic listening.

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