

Educational game based on macromedia flash in Indonesian language learning in junior high school

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ABSTRACT

Educational game is an application package that is used as a tool that aims to encourage students to undergo learning activities. The objectives of this study are (1) to describe educational games based on Macromedia Flash for Indonesian language learning in junior high schools; and (2) to describe the results of implementing Macromedia Flash-based educational games with the Fisher Yates Shuffle algorithm in learning Indonesian in junior high schools. The research approach is a qualitative descriptive research. The research is based on case studies with subjects and objects that focus on class VIII C students and Indonesian language teachers at SMP Negeri 2 Jatisrono. Data collection techniques are by using observation techniques, questionnaires, interviews, and tests. The research sample is 30 VIII C students. Data analysis is guided by Miles & Huberman's view which consists of three streams of activities that occur simultaneously, namely: data reduction, data presentation, drawing conclusions/verification. The data validity test was carried out using source triangulation technique. In connection with the research results based on eight indicators, it can be understood that the level of student activity in learning Indonesian based on educational games based on Macromedia Flash with the Fisher Yates Shuffle algorithm has increased. The percentage of 87% of students explained that the Macromedia Flash application based on the Fisher Yates Shuffle algorithm was able to increase student activity. This research encourages the integration of technology in the world of education. Flash-based games can offer interactive and dynamic content, enhancing the learning experience.

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Introduction

Educational games designed to stimulate thinking are part of increasing concentration and solving problems (Tokarieva et al., 2019; Vidakis et al., 2019). Educational games are able

to attract students' attention and foster a sense of fun and joy in learning activities (Laine & Lindberg, 2020; Sarji & Mampouw, 2022). The main advantage is in the form of visualization of real problems, so that the game is considered interesting as part of the learning media (Farhan et al., 2022; Kholida et al., 2020). Defining efficacy in an educational context can be challenging because of the different variables involved in different learning contexts. In addition, there are disciplinary boundaries which have traditionally meant that a broad cross-disciplinary approach to data collection and analysis is discouraged. But to understand education, and especially questions around efficacy, we need to adopt a more interdisciplinary approach.

Learning becomes a fun and interactive experience. The aim of the game is to motivate students to participate actively, stay involved, and invest their efforts in acquiring knowledge and skills (Pitoyo et al., 2020; Pratiwi et al., 2023; Rianto, 2022). Educational games are software packages as tools that aim to encourage students through game systematics (Nasher & Ferdiansyah, 2021). The presence of variations in learning methods can provide learning experiences that are not monotonous (Rahmawati & Setyaningsih, 2021). Educational games must be developmentally appropriate, meaning that games must consider all aspects of the development of the target age including the physical, motor, social, cognitive, and emotional domains (Buffardi & Valdivia, 2019; Khadijah et al., 2022; Miller & Kocurek, 2017). Game developers working in this field must have an understanding of student development (Mayer, 2019). Building the efficacy of play and learning is a tricky endeavor. It needs to be kept in a wider context to understand how we learn. So how game science fits into the broader disciplinary framework is a critical consideration. Viewed from this educational perspective, the idea of "game science" is part of what we call, "educational science" and because of its digital nature is often placed within a subdiscipline of technology-enhanced learning.

Macromedia Flash is a multimedia platform and software used to create animations, games and internet enrichment applications that can be viewed, played and run in Adobe Flash Player (Masykur et al., 2017). Macromedia Flash is software used to create animated images. The use of Macromedia Flash as a learning medium is useful for teachers as an aid in compiling teaching materials and organizing learning (Fartina et al., 2020; Irvan et al., 2020; Sidik et al., 2020). With the Macromedia Flash application, it is hoped that teachers will be more creative in improving the quality of learning, so that they can improve student learning outcomes (Suyitno et al., 2020). Macromedia Flash is software that has several advantages, including being able to combine text, sound or video in the form of buttons or presentations that can be easily operated by students as a medium and source of learning information that can be studied

at any time. Macromedia Flash is considered easy to learn for people who are not well versed in the field of information technology, because the process does not take a long time.

The development of increasingly advanced technology has led to a variation of the Fisher Yates Shuffle algorithm as an easy way to randomize the digital version of the questions. The algorithm used in designing educational games is the Fisher Yates Shuffle algorithm to randomize the questions that appear in the game (Chen et al., 2017; West et al., 2015). This randomization is expected to be able to randomize questions effectively and efficiently (Hazra et al., 2015; Karawia, 2019). This game based on the Fisher Yates Shuffle algorithm with the Macromedia Flash application offers novelty in the realm of educational games. The Fisher Yates Shuffle algorithm can be used to create interesting games using the Macromedia Flash application.

The application of the concept of artificial digital games is very helpful in various educational problems (Maryono et al., 2018). The concept of this algorithm is expected to be able to apply randomization of questions effectively and efficiently (Hazra et al., 2015; Karawia, 2019). This educational game based on the Fisher Yates Shuffle algorithm with the Macromedia Flash application offers novelty in the realm of education. Universally, randomization of questions is needed in learning to ensure fairness, comprehensive assessment, critical thinking, reduce dependence on memorization, and prepare students to face challenges in the real world (Irfan et al., 2020; Musanna & Kumar, 2019). The learning stage that implements educational games will really help to be active in the learning process and convey messages and lesson content at that time. In line with this, it can arouse students' motivation and interest in learning. Learning media can also help students improve understanding, present data in an interesting and reliable manner, facilitate data interpretation and obtain appropriate information.

Language is an inseparable part of human life. Language is a life skill that is continuous with one another. Language is used and applied in the fields of education, religion, social affairs, and so on (Khair et al., 2021). Language skills include listening, speaking, reading, and writing (Amrullah, 2015; Loren et al., 2017). These four skills are skills that cannot be separated and are continuous with one another. Listening is one of the language skills that influences a person's learning competence (Abdulrahman et al., 2018; Momang, 2021). The learning process of listening activities will be more dominant compared to reading, speaking and writing activities even though all four are integrated with each other. In the context of language learning, listening activities can be a key factor for academic and professional success. Speaking skills are considered as one of the most difficult aspects of language learning (Leong & Ahmadi, 2017). Speaking requires students to master a number of language features that are related to

one another. While reading is an activity that often requires focus, interest and sustained effort, motivation has been found to predict reading performance above and beyond cognitive ability (Bergen et al., 2017; McGeown et al., 2015). Viewed from the aspect of writing, the aim of learning Indonesian is for students to be able to express experiences and ideas, be able to express feelings in writing and clearly, be able to also write down information in accordance with the subject matter (context) and circumstances (situation).

Based on interviews conducted by researchers with Indonesian language teachers, it was stated that the level of ability of junior high school students was still low. This shows that it is less than optimal in the use of learning media to achieve student competence. Teaching materials delivered by teachers so far are only text-based and the majority have not yet implemented digital devices. This problem affects the activity and learning outcomes of students in learning Indonesian materials for advertising texts, slogans and posters in junior high schools. Exploring the use of Macromedia Flash-based educational games as a form of media in learning Indonesian in junior high schools. The aim is to increase students' level of involvement and understanding of advertising text materials, slogans and posters. This reflects the lack of media integration in the curriculum which has not influenced students' activeness and understanding of the material.

Advertising text is persuasive or an invitation to arouse people's minds to buy or use certain products (Inderasari et al., 2021; Latifah et al., 2023; Yulika et al., 2022). Slogan texts are short words or sentences that are used as a basis for life guidelines or main principles of a business, organization, and so on. Posters are almost the same as advertisements, namely notification of an idea, new thing, or important thing to the public (Dewi et al., 2022; T.A & O.A, 2019). Posters rely on a mix of images and words. Posters are usually displayed in public places (Dewi et al., 2022).

Several studies on educational games were developed to provide a new face and the needs of the world of education. Research conducted by Hiasa (2022) shows that digital educational games are an interesting and effective tool for assessment and learning with a variety of students. Participating students, regardless of gender or ethnicity. This research examines a micro-level personalization approach in which a particular type of in-game learning support is tailored to the student's game-based circumstances. Research conducted by Muji et al. (2021) shows that learning evaluation of the type of test or final assessment can be carried out through online application-based games. Through the process of maximizing the use of quiz features in educational games supported by guidance from the teacher. Evaluation of learning through educational games can make it easier for teachers to carry out detailed and

objective assessments. It is important to note that this research will explore the extent to which Macromedia Flash-based games can be used in the context of Indonesian language learning in junior high schools. This research has not explored the impact of using this technology on student understanding, student activity and learning outcomes.

Contradictions in the literature can be seen depending on the context, topic and game elements applied. In line with research conducted by previous researchers (state of the art) revealed that educational games are utilized through various media (based on the applications used) (Muji et al., 2021; Nasher & Ferdiansyah, 2021; Shute et al., 2021). In contrast to the results of previous studies, this study reveals the escalation of indicators of student activity through the implementation of educational games based on the Fisher Yates Shuffle algorithm. Through questions designed to guide students to be interactive. Students are able to manage time flexibly when answering questions and at the end of the evaluation the value obtained will be displayed (Muliya, 2022; Windawati & Koeswanti, 2021). Based on the background of the problem, it can be explained that the aims of this research are (1) to describe educational games based on Macromedia Flash for Indonesian language learning in junior high schools; and (2) to describe the results of implementing Macromedia Flash-based educational games with the Fisher Yates Shuffle algorithm in learning Indonesian in junior high schools level.

The research context regarding the use of Macromedia Flash-based educational games in Indonesian language learning in junior high schools contains research gaps that need to be explored further. One of them is an in-depth evaluation of how educational games can be integrated into the official Indonesian language learning curriculum in junior high schools. The differences between conventional approaches and technology-based methods need to be researched thoroughly to understand their impact on achieving Indonesian language learning goals. Apart from that, more in-depth research is still needed regarding the factors that influence students' activeness in using Macromedia Flash games in learning Indonesian. This research can help create clearer guidelines for optimizing the benefits of technology-based educational games in Indonesian language learning in junior high schools.

Method

The design of this research is qualitative research with a case study research strategy. Qualitative methods are research methods used to test theories. This was done to obtain general conclusions. A case study research strategy is research carried out on certain objects in a real life context, temporary and specific in nature (Behnamnia et al., 2020; Jojor & Sihotang, 2022). Case studies involve observations of the learning process in the classroom. Collect data on test results and questionnaires from students who have taken part in learning using this

method. This implementation helps analyze the impact of educational games on Indonesian language learning.

This research was conducted at SMP Negeri 2 Jatisrono which is located at Pandeyan, Jatisrono District, Wonogiri Regency, Central Java. The reason the researcher carried out research in this place was related to an interesting phenomenon in the academic environment. This is also based on the connection with the problems studied by researchers. Research subjects included class VIII C students and Indonesian language teachers. The object of the research involves studying the implementation of Macromedia Flash-based educational games (including selection, design, development and use) of games in Indonesian language learning at the junior high school level.

The data source referred to in research is the subject from which data can be obtained and has clear, valid information. Primary data in this research is the result of direct interviews conducted with junior high school students and Indonesian language subject teachers. Results of observations or direct observations on implementation activities of Macromedia Flash-based educational games with the Fisher Yates Shuffle algorithm in Indonesian language learning in junior high schools. Data collection techniques using observation, questionnaires, interviews, and tests. The research sample was 30 VIII C students. Data analysis is guided by Miles & Huberman's view consisting of three streams of activities that occur simultaneously, namely: data reduction, data presentation, drawing conclusions/verification.

Table 1. Number of Questionnaire Respondents on Student Activity Level and Learning Outcomes.

Grade	Respondent	
	Male	Female
VIII C	16	14
Number of Respondent's	30	

The data validity test was carried out using source triangulation technique. Triangulation is the collection of data obtained from various sources to minimize and understand the differences that researchers might get (Montiel-Ruiz et al., 2023). Triangulation with sources means comparing and checking back the degree of trust in information obtained through various sources, namely the combination of student and teacher questionnaires about the use of educational games based on Macromedia Flash with the Fisher Yates Shuffle algorithm in Indonesian language learning in junior high schools.

Results and Discussion

In general, the implementation of this research was carried out by referring to case study research. The case study is carried out in the form of an in-depth analysis of the educational conditions at the school. The main goal is to understand the needs and expectations of all parties involved. It is understood that the results of the research show that there are innovations made by teachers in learning Indonesian in advertising text materials, slogans and posters in class VIIC SMP. Implementing digital learning media that is able to encourage student activity and develop learning achievement.

Educational games based on Macromedia Flash for Indonesian language learning in junior high schools

The use of games focuses on the element of fun and honing language skills. Mee et al. (2021) suggest that to achieve mastery goals and performance goals it is very important to gain mastery experiences in creativity. The attitude of students who play games shows aggressiveness, but with a high level of competence. Motivation in playing games involves curiosity, challenge, a sense of dominance, competition, social communication, variety, excitement effects, relaxation, avoiding stress, being able to restart many times, taking a break, spending free time, and escaping from real life.

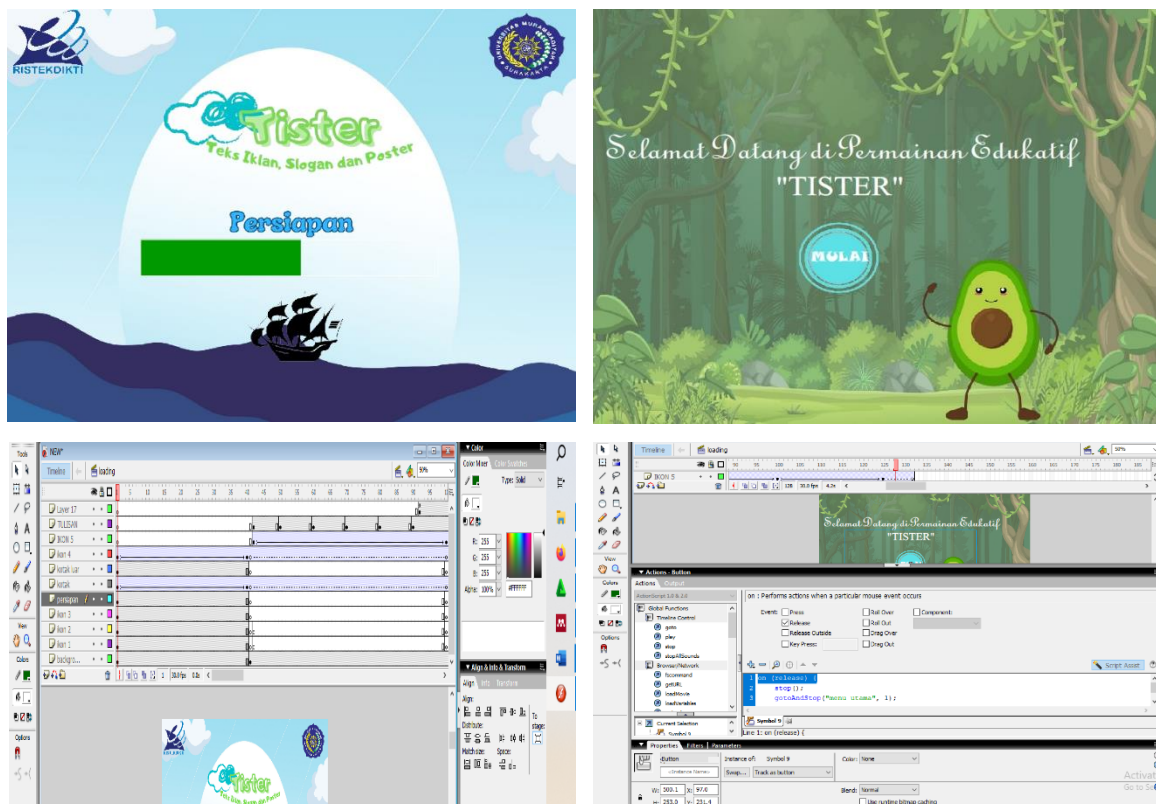


Fig 2. Form of educational game "TISTER"

This "TISTER" application actually stands for advertising text material, slogans and posters. It should be understood that this application is a learning medium for presenting learning materials and evaluations online. Through this application, core competencies and basic competencies are displayed which include the learning carried out. There is a display of material that integrates edutainment concepts. In line with the material that has been submitted, they will be directed to carry out an evaluation based on Macromedia Flash. This evaluation is not solely to fulfill learning outcomes. Please note that the implementation of this evaluation will include improving listening skills. The profile view will be conveyed regarding the several people who are responsible for creating the "TISTER" application. As understood, the "TISTER" application is a new application, so instructions for use will be explained in it (regarding certain buttons and access that can be used). An explanation of the urgency will be conveyed in this application. In connection with this educational game, how big is the level of urgency in the education sector.

The positive results of this application can be seen clearly in the results of the scores obtained by students. From increasing student scores it can be interpreted that educators have the ability to create an educational environment that is fun, meaningful, creative, dynamic and interactive as stated by (Wasito et al., 2022). Thus, students' hopes will be fulfilled to be able to hone their curiosity and be encouraged to enjoy knowledge more (Kesuma et al., 2022; Pursitasari et al., 2019). This encourages students to think critically, solve problems in a fun way, so that the ability to express ideas is more developed, which of course will increase student achievement in the learning process (Laiya et al., 2022; Setiawan et al., 2021; Sumantri et al., 2022; Susanti, 2020).

Randomization of the questions was planned and carried out using the Fisher Yates Shuffle algorithm. It is hoped that this random question will be able to make random material problems escalate effectively and efficiently. Explanations are given in the form of a table of questions. The process of randomizing 20 questions using the Fisher Yates Shuffle algorithm theory is an efficient method and can produce a random and fair randomization. By using the theory of the Fisher Yates Shuffle algorithm, teachers can ensure that each question has the same opportunity to appear at any position in the list of random questions. This provides fairness and variety in the assignment of questions to students, thereby creating a dynamic and unpredictable experience in the testing or evaluation process.

Macromedia Flash is one of the producers of educational games based on the Fisher Yates Shuffle algorithm. This media can also stimulate students to manipulate concepts and be able to find out the real form of understanding Indonesian language material (Tsany et al.,

2020). Users of this program are able to be creative easily and freely to produce animations with flexible movements according to the flow of the desired animation scene, resulting in relatively small files (Agustina et al., 2022; Putri et al., 2022).

It contains a similar positive impact from empirical studies regarding the application of multimedia in learning, concluding that multimedia has the potential to enhance learning as stated by (Alias et al., 2015; Beege et al., 2018). Macromedia Flash is a multimedia capable of producing video, animation, images and sound in an easy and effective way (Rahmi et al., 2019). The algorithm that is used to design educational games is the Fisher Yates Shuffle algorithm which performs a systematic random question on the game (Fujiati & Rahayu, 2020; Rohmah et al., 2020; Yadav et al., 2017). This randomization is expected to be able to randomize questions effectively and efficiently (Subaeki & Ardiansyah, 2017).

The results of the implementation of Macromedia Flash-based educational games with the Fisher Yates Shuffle algorithm in Indonesian language learning in junior high schools

Various content in the educational application "TISTER" relates to ki and kd, materials, evaluations, profiles, instructions for use, and the urgency of the application. Online formative assessment functions are also needed in today's online learning systems (Tsai et al., 2015). Although online formative assessment offers the opportunity to retake tests at a convenient time, some studies have also found that not all online learners use online formative assessment tools in their online learning.

Table 2. Indicator of Student Activity Level

No.	Activity Level Indicator
1.	Participate in learning activities.
2.	Involved in finding answers to the problems discussed.
3.	Ask when students encounter various problems.
4.	Search for the information needed to solve several problems encountered by students.
5.	Conduct group discussions.
6.	Reflecting on students' skills related to the material presented.
7.	Able to solve problems.
8.	Apply the theory that has been presented to solve various problems faced.

The majority of researchers have noted that increasing the level of participation in using online formative assessments in learning is becoming more important. The Indonesian language learning materials implemented are in the form of advertising texts, slogans and posters. The aspects in question are: (1) participating in learning activities, (2) being involved

in finding answers to the problems discussed, (3) asking questions when students encounter various problems, (4) looking for information needed to solve some of the problems students encounter, (5) conducting group discussions, (6) reflecting on students' skills related to the material presented, (7) being able to solve problems, and (8) applying the theory that has been presented to solve various problems faced. The use of the Macromedia Flash application based on the Fisher Yates Shuffle algorithm as a learning medium is a fresh new variation. This implementation is also rarely carried out by the majority of teachers, so class VIII C students are also enthusiastic about this new face. Student activity becomes an active stimulus in learning. This can be shown from the very large response of class VIII C students, namely 87%. Student activity is presented in Fig 3.

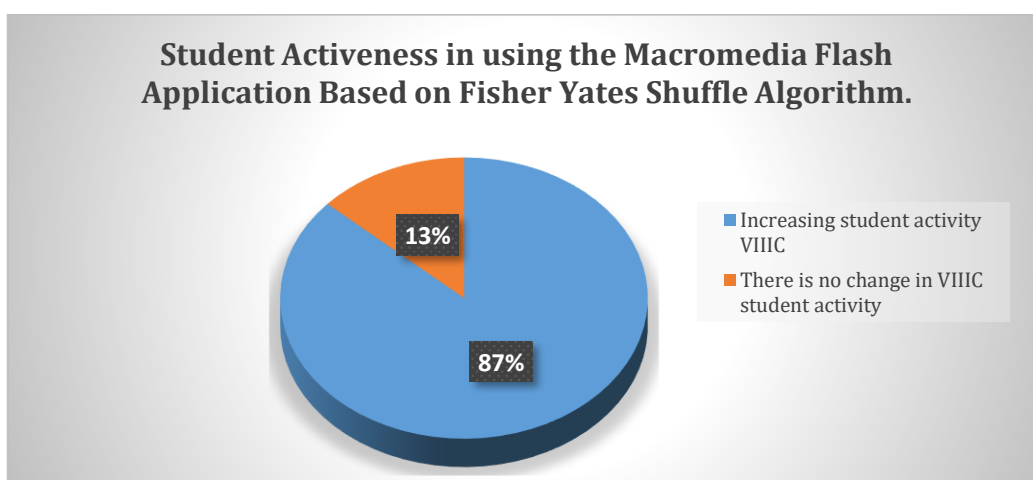


Fig 3. Student Activeness in using the Macromedia Flash Application based on the Fisher Yates Shuffle Algorithm

The percentage presented in Fig 3 shows that student activity is very high, namely 87%. Through Fig 3 it can be seen that this learning activity is useful in increasing student activity, 87% of students explained that the Macromedia Flash application based on the Fisher Yates Shuffle algorithm was able to increase student activity. Indeed, there are still students who feel that there has been no increase in their activity during the learning process. Students who felt there had been no increase in activity were 13%. Closely related to the majority of class VIII C students stating that there was a change for the better (in relation to the escalation of activity during learning). With regard to the evaluation score, it is necessary to understand that the minimum completeness criteria (KKM) score for Indonesian subjects is 75. Through the Macromedia Flash application, an evaluation will be displayed after students work on the questions given. In line with the results of observations in class VIII C, it has a positive impact in relation to the level of student completeness. A total of 26 class VIII C students were able to

optimally work on the questions through educational games using the Macromedia Flash application. This is based on obtaining a score of more than 80.

The manifestation of student activity when carrying out learning activities is an aspect of student involvement in learning activities (Nurhayati, 2020; Prasetyo & Abduh, 2021; Setiawan et al., 2021). In this research, the conclusion of the percentage level of student activity is in line with research by Azzizah & Nugraheni (2022) and Prasetyo (2021) which applies eight indicators of student activity. Evidence of student activity was found. Based on observations of the aspects that underlie the activity contained in the research as well as aspects of student activity according to Prasetyo (2021). The aspects in question are: (1) participating in learning activities, (2) being involved in finding answers to the problems discussed, (3) asking questions when students encounter various problems, (4) looking for information needed to solve some of the problems students encounter, (5) conducting group discussions, (6) reflecting on students' skills related to the material presented, (7) being able to solve problems, and (8) applying the theory that has been presented to solve various problems faced. This indicator is different from the indicators of student activity in learning that were previously explained, namely the indicators in Meilawati's (2022) research which describes five aspects of student activity. The five indicators are: (1) students actively ask questions, (2) students actively express opinions, (3) students actively answer questions, (4) actively do assignments, and (5) dare to present learning results.

Digital-based assessment refers to an evaluation or assessment process that fully uses digital technology as the main platform (Tomczyk et al., 2022). This means that the entire assessment process, from delivering instructions, collecting responses, to assessing results, is carried out electronically. Online tests (with this assessment involving delivery of the test via a digital platform). Participants answer questions online using a variety of delivery methods. Online tests often use special software that can provide automatic scores or generate reports instantly. This is supported by the question whether this educational game has an impact on (student activity and learning outcomes). The criteria for assessing student perceptions can be seen in Table 3.

The questionnaire design in this research was to determine the level of student activity. All components in the questionnaire were validated by credible researchers and pre-tested on different participants to confirm the trustworthiness of the questionnaire. The questionnaire contains eight (8) questions. Regarding the eight (8) questions in the form of responses classified into a four-point Likert scale which includes the categories: 1) strongly disagree, 2) disagree, 3) agree, and 4) strongly agree (Suriaman et al., 2023).

Table 3. Criteria for assessing the level of students' perceptions of activeness during Indonesian language learning in junior high school.

Questions	Answer's Choice			
	Strongly Disagree (STS)	Don't agree (TS)	Agree (S)	Strongly agree (SS)
1. Students are able to participate in learning activities.				
2. Students are actively involved in finding answers to the problems discussed.				
3. Students ask questions when students encounter various problems.				
4. Students look for the information needed to solve some of the problems students encounter in group discussions.				
5. Students carry out group discussions.				
6. Students reflect on student skills related to the material presented.				
7. Students are able to solve problems.				
8. Students apply the theory that has been presented to solve various problems faced.				

Scale	Category
1	Strongly Disagree (STS)
2	Don't Agree (TS)
3	Agree (S)
4	Strongly Agree (SS)

To determine students' perceptions about the effectiveness of Macromedia Flash-based educational games in learning Indonesian in junior high schools. This includes filling in a satisfaction scale that contains their personal opinions. More specifically, it looks at how the Macromedia Flash application with the Fisher Yates Shuffle algorithm supports students in the learning process.

Table 4. Interpretation Criteria for Student Scores

Score Intervals (%)	Qualification
$P \leq 100\%$	Very Good (SB)
$65\% \leq P < 85\%$	Good (B)
$45\% \leq P < 65\%$	Fairly Good (CB)
$25\% \leq P < 45\%$	Not Good (KB)

The results of class VIII C students' responses were to determine the level of student activity through educational games. The researcher implemented the formula that has been explained and calculated the response scores for class VIII C students. Student A was given a questionnaire in the form of eight (8) questions related to indicators of increasing the level of student activity. Overall, student A got a score of 27. For comparison, student B got a score of 23 from filling in the questionnaire that was distributed. The score is integrated into the formula that has been explained. The average percentage of each component is calculated by the formula:

$$P = \frac{\Sigma_R}{\Sigma_X} \times 100\%$$

Information:

P = Percentage of student responses

Σ_R = The total score for each criterion chosen by the student

Σ_X = The ideal score for student responses to educational games

Calculation of scores for student A

$$P = \frac{\Sigma_R}{\Sigma_X} \times 100\%$$

$$P = \frac{27}{32} \times 100\%$$

$$P = 84,37\% \text{ (good)}$$

Calculation of scores for student B

$$P = \frac{\Sigma_R}{\Sigma_X} \times 100\%$$

$$P = \frac{23}{32} \times 100\%$$

$$P = 71,87\% \text{ (good)}$$

The results of this research are supported by previous research presented by Supriharyanti et al. (2020) revealed that there were 26 students who got a score of more than or equal to 70. Of this, 90% of students passed the test. In connection with the test results, students also provided responses indicating that the Macromedia Flash digital module was very useful. Macromedia Flash digital module to increase student motivation and understanding in learning. From the presentation of this study, it can be concluded that the Macromedia Flash digital module is very effective when used in mathematics learning. In line with this, research carried out by Maryono et al. (2018) stated that the Fisher Yates Shuffle algorithm is reliable for randomizing questions and answers in multiple choice models. In line with this, the results obtained from collecting questionnaires for VIII C students. Overall, student A got a score of 27 after calculating the percentage obtained by a formula of 84.37%. For comparison, student B got a score of 23 from filling in the questionnaire which was

distributed after calculating it using a formula to obtain a percentage of 71.87%. Research conducted by Maryono et al. (2018) stated that the Fisher Yates Shuffle algorithm is reliable for randomizing questions and answers in multiple choice models. This algorithm is very suitable for installation in learning media that has features for exams.

This research describes the implementation of educational games using the Macromedia Flash application based on the Fisher Yates Shuffle algorithm. Hiasa (2022); Muji et al. (2021); Suryani et al. (2022) states that online learning media is not only about the application of knowledge and evaluation. This research found that the novelty of educational games can encourage students to think creatively, find unique solutions to problems, and think critically. This is in accordance with the concept of using randomization of questions (Fisher Yates Shuffle algorithm) in educational games.

Research conducted by Muji et al. (2021); Nasher & Ferdiansyah (2021); Shute et al. (2021) highlight approaches through different applications to integrate educational games in the learning process. Therefore, this latest research offers interesting insights by identifying improved indicators of student engagement through the application of the Fisher Yates Shuffle algorithm. Using specially designed questions, students are directed to participate interactively, allowing students to manage their time more flexibly when answering questions. Evaluation results are also displayed transparently, providing a better understanding of the assessments obtained by students (Muliya, 2022; Windawati & Koeswanti, 2021). This discussion highlights the importance of the right approach in the use of educational games and how this can influence student engagement in learning, making a significant difference in the final learning outcomes.

Conclusion

Closely related to several aspects of indicators of student activeness in learning, this results in a percentage level of 87% that students are making progress. This shows that the Macromedia Flash application based on the Fisher Yates Shuffle algorithm is able to increase student activity. This can be seen from the analysis of questionnaire data on eight (8) indicators of student learning independence, namely: (1) participating in learning activities, (2) being involved in finding answers to the problems discussed, (3) asking questions when students encounter various problems, (4) look for the information needed to solve several problems encountered by students, (5) conduct group discussions, (6) reflect on students' skills related to the material presented, (7) be able to solve problems, and (8) apply the theory that has been delivered to solve various problems faced. The positive results of this application are clearly visible in the grades obtained by students. From the increase in student scores, it can be

interpreted that educators have the ability to create an educational environment that is fun, meaningful, creative, dynamic and interactive. This "TISTER" application actually stands for advertising text material, slogans and posters. It should be understood that this application is a learning medium for presenting learning materials and evaluations online.

Declarations

- Author contribution** : Ermira Nilansari Putri is responsible for all writing projects. He also leads screenwriting for data collection, transcription, and analysis. The second author, the third author, and the fourth author who is a lecturer and research collaboration partner, agreed to the final manuscript of this paper.
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- Ethics Approval** : Information on Ethical Consent and informed consent statements are required for all articles published on BAHASTRA since 2023.
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