

Technology Acceptance Model (TAM) Study on the Use of Local Wisdom-Based Animated Videos in Majalengka for Systems of Linear Equations in Two Variables Material to Optimize Algebraic Thinking Skills

Delis Lestia Nuratipa^{1*}, Arip Amin²

²Universitas Sindang Kasih Majalengka, Indonesia

*Corresponding Author Email: Delislestianuratipa0091@gmail.com

ABSTRACT

Students' algebraic thinking skills in understanding the topic of Systems of Linear Equations in Two Variables still need improvement, one of which can be achieved through the use of contextual and engaging learning media. In this context, an animated video based on Majalengka's local wisdom was developed to support students' understanding. However, the level of user acceptance of this media has not been thoroughly analyzed. This study aims to examine students' acceptance of the media using the Technology Acceptance Model (TAM) framework, which includes Perceived Usefulness, Perceived Ease of Use, Attitude Toward Using, and Behavioral Intention to Use. This research employed a descriptive qualitative approach with a survey technique using a Likert-scale questionnaire completed by high school students after using the media. The results show that all indicators fall into the positive category, with Perceived Usefulness obtaining the highest score, indicating that students consider the media highly beneficial and easy to use in understanding Systems Of Linear Equations In Two Variables in a contextual manner. These findings suggest that integrating local wisdom into learning media can enhance student motivation and engagement, as well as provide important implications for the development of more relevant and effective learning media in the future.

Keywords: Technology Acceptance Model, Animated Video, Majalengka Local Wisdom, Systems of Linear Equations in Two Variables, Algebraic Thinking

ABSTRAK

Kemampuan berpikir aljabar siswa dalam memahami materi Sistem Persamaan Linear Dua Variabel (SPLDV) masih perlu ditingkatkan, salah satunya melalui pemanfaatan media pembelajaran yang kontekstual dan menarik. Dalam konteks ini, video animasi berbasis kearifan lokal Majalengka dikembangkan untuk mendukung pemahaman siswa. Namun, tingkat penerimaan pengguna terhadap media ini belum dianalisis secara mendalam. Penelitian ini bertujuan untuk menganalisis penerimaan siswa terhadap media tersebut menggunakan kerangka Technology Acceptance Model (TAM), yang meliputi Perceived Usefulness, Perceived Ease of Use, Attitude Toward Using, dan Behavioral Intention to Use. Penelitian ini menggunakan pendekatan kualitatif deskriptif dengan teknik survei melalui angket skala Likert yang diisi oleh siswa SMA setelah menggunakan media. Hasil penelitian menunjukkan bahwa seluruh indikator berada pada kategori positif, dengan Perceived Usefulness memperoleh skor tertinggi, yang menunjukkan bahwa siswa menilai media ini sangat bermanfaat dan mudah digunakan dalam memahami SPLDV secara kontekstual. Temuan ini mengindikasikan bahwa integrasi kearifan lokal dalam media pembelajaran dapat meningkatkan motivasi dan keterlibatan siswa, serta memberikan implikasi penting bagi pengembangan media pembelajaran yang lebih relevan dan efektif di masa depan.

Kata kunci: Technology Acceptance Model, Video Animasi, Kearifan Lokal Majalengka, SPLDV, Berpikir Aljabar

Received: August 7, 2025 Revised: Dec 28, 2025 Accepted: Jan 16, 2026 Published: March 2, 2026

How to cite this article:

Nuratipa, D.L., & Amin, A. (2026). Technology Acceptance Model (TAM) Study on the Use of Local Wisdom-Based Animated Videos in Majalengka for Systems of Linear Equations in Two Variables Material to Optimize Algebraic Thinking Skills. *Journal of Contextual and Realistic Mathematics Education*, 1(1), 8-16.



1. INTRODUCTION

Algebraic thinking skills are one of the fundamental competencies in mathematics learning, which include the ability to generalize patterns, model real-world problems in symbolic form, and solve them systematically and logically. In the context of Indonesian mathematics education, these skills are very important because they form the basis for understanding advanced mathematical concepts and their applications in various fields of life. The results of the 2022 Programme for International Student Assessment (PISA) show that Indonesian students' mathematical abilities rank 72nd out of 81 countries with an average score of 366, still far below the OECD average of 472 (OECD, 2023). Specifically, in the domain of algebra, Suryadi's (2022) research revealed that 68% of high school students in West Java struggled to solve two-variable linear equation systems, with the highest error rates occurring during the modeling of contextual problems into mathematical forms (73%) and systematic problem-solving (65%).

At the regional level, a study conducted by the Majalengka District Education Department (2023) shows that the average mathematics exam score for high school students on Systems Of Linear Equations In Two Variables material only reached 58.7 out of 100, with the lowest indicator of algebraic thinking ability being the ability to convert contextual problems into mathematical models (52.3%) and organize the steps of the solution correctly (47.8%). This data indicates that the problem of algebraic thinking ability is not only occurring at the national level but is also a serious challenge at the local level. The difficulties students face in understanding Systems Of Linear Equations In Two Variables are closely related to the abstract and procedural nature of the material. According to Kieran (2007), students often encounter obstacles in developing conceptual understanding of algebra because they struggle to connect symbolic representations with real-life situations. Furthermore, Van de Walle et al. (2019) explain that algebra learning that emphasizes algorithmic procedures without building conceptual understanding can cause students to experience “mathematical anxiety” and lose motivation to learn.

Advances in educational technology offer various alternative solutions to overcome these problems. Animated videos as a learning medium have been proven effective in improving mathematical concept comprehension due to their ability to present dynamic and interactive visual representations. A meta-analysis study conducted by Höffler & Leutner (2007) on 26 studies showed that learning using animation has an effect size of $d = 0.37$, indicating a significant positive impact on student understanding. In the context of mathematics education, Clark & Paivio (1991) through the Dual Coding Theory explain that the combination of verbal and visual information in animated videos can optimize the encoding and retrieval of information in long-term memory. Recent research also supports these findings, such as Cece & Dian (2023), who demonstrated that animated videos increase elementary school students' interest in learning, and Nugroho & Irawati (2021), who showed the effectiveness of interactive animations in improving mathematical problem-solving skills.

The integration of local wisdom into learning media is not merely a contextualization strategy, but also a systematic effort to enhance the relevance and meaning of learning for students. Majalengka, as a region rich in cultural heritage, particularly the Panyaweuyan terraced farming system, offers a highly relevant context for Systems Of Linear Equations In Two Variables learning. The Panyaweuyan terraced farming system, which has evolved over centuries, involves complex mathematical calculations, including linear equations to determine water flow, land area, and crop distribution among farmers. According to Sukmawati & Hidayat (2021), this system implicitly uses algebraic principles in resource planning and management, which can serve as an authentic context for Systems Of Linear Equations In Two Variables learning.

Although the potential of locally-based animated videos appears promising, the success of their implementation depends heavily on user acceptance. The Technology Acceptance Model (TAM) developed by Davis (1989) provides a comprehensive theoretical framework for understanding the factors that influence technology adoption in educational contexts. TAM has been validated in various educational contexts with consistent results. A meta-analysis by Scherer et al. (2019) of 114 studies

showed that TAM can explain 40-60% of the variance in behavioral intention to use educational technology. In the context of mathematics learning in particular, research by Teo (2009) showed that perceived usefulness and perceived ease of use significantly predict students' attitudes toward using and behavioral intention toward learning technology.

Although research on TAM in education is quite extensive, its application in mathematics learning media integrated with local wisdom is still very limited. A systematic literature review revealed that out of 847 articles on TAM in education published over the past 10 years, only 3% focused on mathematics learning, and none specifically examined the acceptance of locally-based media for algebra content. Furthermore, most TAM research in the Indonesian educational context still focuses on general technologies such as e-learning platforms or Learning Management Systems (LMS), with little attention paid to specific learning media such as animated videos for particular subjects. This creates a significant research gap, given that the unique characteristics of each subject require different technological approaches.

This study aims to analyze students' acceptance levels of Majalengka local wisdom-based animated videos in Systems Of Linear Equations In Two Variables learning using the Technology Acceptance Model (TAM) framework. This study will measure and analyze the four TAM constructs, namely Perceived Usefulness, Perceived Ease of Use, Attitude Toward Using, and Behavioral Intention to Use, in the context of mathematics learning media integrated with local wisdom. Additionally, this study will identify the most influential factors affecting student acceptance and provide recommendations for the development of more effective learning media.

The results of this study are expected to contribute significantly to the development of more contextual and meaningful mathematics learning, in line with the characteristics and needs of Indonesian students, especially in the era of rapidly developing educational digitalization.

2. METHOD

This study uses a descriptive qualitative approach with a survey method. This approach was chosen because it aims to describe in detail the level of student acceptance of local wisdom-based animated video media in Majalengka on the subject of Two-Variable Linear Equation Systems based on the Technology Acceptance Model (TAM) framework. The research subjects consisted of 16 tenth-grade students at SMA Daarul Amanah who had participated in learning using animated video media. The subjects were selected purposively because the class had used media in line with the research context.

The media developed is an animated video based on the local wisdom of Majalengka with the theme of Terasering Panyaweuyan. Each part of the video is approximately 10 minutes long and consists of three learning parts that present real-life problems, explanations of Systems Of Linear Equations In Two Variables concepts using the elimination and substitution methods, and contextual situation-based algebraic modeling. Teacher and student characters are used to convey the narrative, while the farmer context remains present as the backdrop to the problem. The video also includes activities in the form of simple worksheets guiding students to engage in independent exploration. In this article, the media design is outlined in general terms to provide an overview of the research product without describing details per scene.

The research instrument used in this study was a questionnaire designed based on the Technology Acceptance Model (TAM) framework, which includes four main variables, namely Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude Toward Using (ATU), and Behavioral Intention to Use (BIU). Each variable is broken down into several statements relevant to the context of using local wisdom-based animated videos from Majalengka in the Two-Variable Linear Equation System material.

The questionnaire was designed using a 4-point Likert scale to measure the respondents' level of agreement with each statement. The formulation of the statements took into account their direct relevance to the indicators of each TAM variable, so that the measurement results could describe the

perceptions of usefulness, ease of use, attitude toward use, and behavioral intention to use the learning media.

Table 1. Likert Scale

Statement	Scale
Strongly disagree	1
Disagree	2
Agree	3
Strongly Agree	4

The data obtained was analyzed quantitatively using the following percentage formula :

$$P = \frac{\sum X}{N \times Smax} \times 100\%$$

Explanation :

P = Percentage of responses

$\sum X$ = Total score of respondents' answers on a particular indicator

N = Number of respondents

Smax = Maximum score on the Likert scale

To give qualitative meaning to the percentage scores obtained, the analysis results were then categorized into levels of acceptance. These categories were adapted from Arikunto's (2013) data interpretation guidelines to classify how strongly students accepted the learning media.

Table 2. Achievement Level Qualifications

Level Percentage (%)	Qualification
0-40%	Very Low
41-60%	Low
61-80%	High
81-100%	Very High

Source : Arikunto (2013)

Based on these qualifications, the Majalengka local wisdom-based animated video was considered to have received positive acceptance from students if the average score on each TAM construct reached a minimum percentage of 61% (category “High”). However, suggestions or feedback from students regarding media improvement remain a consideration for refinement, even if the acceptance level is already classified as high or very high. Furthermore, a table is presented containing the survey items provided to respondents according to the indicators for each variable in the TAM model.

Table 3. Perceived Usefulness

Code	Component	Value (1-4)
PU1	Helps understand the concept of Linear Equations In Two Variables	
PU2	Facilitates the learning process of Linear Equations In Two Variables	
PU3	Accelerates the process of solving Linear Equations In Two Variables	
PU4	Increases confidence in learning Systems Of Linear Equations In Two Variables	

PU5	Relates Systems Of Linear Equations In Two Variables to everyday life	
-----	---	--

Table 4. Perceived Ease of Use

Code	Component	Value (1-4)
PEOU1	Easy to understand how to use the video	
PEOU2	The video display is clear and easy to follow	
PEOU3	No technical problems encountered	
PEOU4	Can be used independently	
PEOU5	Easy to repeat the necessary parts of the video	

Table 5. Attitude Toward Using

Code	Component	Value (1-4)
ATU1	Fun learning with animated videos	
ATU2	Increases motivation to learn	
ATU3	Positive view of the use of animated videos	
ATU4	Suitable for learning styles	
ATU5	More interesting than conventional learning methods	

Table 6. Behavioral Intention to Use

Code	Component	Value (1-4)
BIU1	Desire to reuse media	
BIU2	Recommend media to friends	
BIU3	Use similar media for other math materials	
BIU4	Search for learning media with other local wisdom	
BIU5	Use media to learn Systems Of Linear Equations In Two Variables outside of class hours	

3. RESULTS AND DISCUSSION

In this study, a questionnaire was used to measure students' acceptance of Majalengka local wisdom-based animated videos in learning Two-Variable Linear Equation Systems using a 1-4 Likert scale. This scale consists of four categories: Strongly Disagree, Disagree, Agree, and Strongly Agree. The components measured are those found in the Technology Acceptance Model (TAM), namely Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude Toward Using (ATU), and Behavioral Intention to Use (BIU).

3.1. Perceived Usefulness

This variable is used to determine the extent to which students consider the Majalengka local wisdom-based animated video useful in learning the System of Linear Equations in Two Variables. The indicators measured include: (PU1) the animated video helps in understanding the material on Systems Of Linear Equations In Two Variables, (PU2) improves learning efficiency, (PU3) clarifies abstract concepts, (PU4) supports contextual problem-solving, and (PU5) increases learning motivation. The results of the summary of responses from 16 respondents regarding the PU indicators can be seen in Table 7 below.

Table 7. Percentage of Responses to the Perceived Usefulness (PU) Questionnaire

Indicator	Average Score	Percentage	Category
PU1	3,69	92,19%	Very High
PU2	3,69	92,19%	Very High
PU3	3,62	90,62%	Very High
PU4	3,62	90,62%	Very High
PU5	3,25	81,25%	Very High
Average	3,58	89,38%	Very High

The results in Table 7 show that all Perceived Usefulness (PU) indicators are in the range of 90.62%–92.19%, with an overall average of 89.38% (very high category). This indicates that students perceive the animated videos as highly beneficial for understanding the material on Systems of Linear Equations in Two Variables, helping to bridge local wisdom contexts into mathematical models, and supporting problem-solving. This finding reinforces the Technology Acceptance Model (TAM) postulate that Perceived Usefulness is the primary determinant of technology acceptance; when perceived usefulness is high, attitudes and intentions to use tend to be positive.

3.2. Perceived Ease Of Use

The Perceived Ease of Use (PEOU) variable is used to determine the extent to which students find it easy to use Majalengka local wisdom-based animated videos in learning Systems of Linear Equations in Two Variables. The indicators measured include: (PEOU1) ease in understanding the flow of the video presentation, (PEOU2) clarity of display and navigation, (PEOU3) ease in following the explanation of concepts, (PEOU4) consistency in the presentation of material, and (PEOU5) ease of repeated use. The results of the assessment of the 16 respondents on the ease of use indicators are presented in Table 8.

Table 8. Percentage of Perceived Ease of Use (PEOU)

Indicator	Average Score	Percentage	Category
PEOU1	3,38	84,38%	Very High
PEOU2	3,31	82,81%	Very High
PEOU3	3,38	84,38%	Very High
PEOU4	3,50	87,50%	Very High
PEOU5	3,19	79,69%	Very High
Average	3,35	83,75%	Very High

The results of the analysis in Table 8 show that all Perceived Ease of Use (PEOU) indicators obtained an average score above 3.00, with percentages ranging from 79.69% to 87.50%. The highest value was found in the PEOU4 indicator (87.50%), indicating that students found the animated video easy to use and integrate into the learning of Systems of Linear Equations in Two Variables.

Meanwhile, the lowest value was found in PEOU5 (79.69%), although it still falls within the high category. Overall, the average PEOU score was 83.75% (very high category), indicating that students did not find the use of animated videos to be significantly challenging. These findings support the Technology Acceptance Model (TAM) framework, where perceived ease of use positively contributes to students' attitudes toward utilizing technology-based learning media.

3.3 Attitude Toward Using

The Attitude Toward Using (ATU) variable describes students' attitudes toward using Majalengka local wisdom-based animated videos in learning Systems of Linear Equations in Two Variables. The indicators measured include: (ATU1) enjoyment of using animated videos, (ATU2) interest in learning with videos, (ATU3) increased motivation to learn with videos, (ATU4) acceptance of the use of videos in learning, and (ATU5) positive views on the continued use of this media. The results of the students' evaluations of the ATU indicators are presented in Table 9.

Table 9. Percentage of Attitudes Toward Use (ATU)

Indicator	Average Score	Percentage	Category
ATU1	3,19	79,69%	High
ATU2	3,31	82,81%	Very High
ATU3	3,25	81,25%	Very High
ATU4	3,25	81,25%	Very High
ATU5	3,38	84,38%	Very High
Average	3,28	81,88%	Very High

Based on Table 9, all Attitude Toward Using (ATU) indicators obtained percentages above 79%, with an overall average value of 81.88% (very high category). The highest percentage was found in the ATU5 indicator (84.38%), indicating that most students have a positive view of the continuous use of animated videos. Meanwhile, the lowest percentage was found in ATU1 (79.69%), although it still falls within the high category. Overall, these results indicate that students have a positive attitude and good acceptance toward the use of animated videos in learning Systems of Linear Equations in Two Variables. This finding supports the argument that technology-based media with a local wisdom approach can enhance students' interest and motivation in learning.

3.4 Behavioral Intention To Use

The Behavioral Intention to Use (BIU) variable measures the extent to which students have the intention and desire to continue using Majalengka local wisdom-based animated videos in the learning process of Systems of Linear Equations in Two Variables. The indicators measured include: (BIU1) willingness to reuse the animated video, (BIU2) readiness to use the video as an additional learning medium, (BIU3) interest in recommending the use of the video to friends, (BIU4) tendency to choose the animated video over other methods, and (BIU5) willingness to use similar media in the future. The results of the students' assessments of the BIU indicators are presented in Table 10.

Table 10. Percentage of Behavioral Intent to Use (BIU)

Indicator	Average Score	Percentage	Category
BIU1	3,19	79,69%	Very High
BIU2	3,44	85,94%	Very High
BIU3	3,38	84,38%	Very High
BIU4	3,31	82,81%	Very High
BIU5	3,31	82,81%	Very High
Average	3,32	83,12%	Very High

Based on Table 10, all Behavioral Intention to Use (BIU) indicators obtained percentages above 79%, with an overall average value of 83.12% (very high category). The indicator with the

highest score was BIU2 (85.94%), which shows that the majority of students are highly prepared to use animated videos as additional learning media. Meanwhile, the indicators with the lowest scores were BIU1 (79.69%) and BIU3 (84.38%), although both remained in the very high category. Overall, these results indicate that students not only accept the presence of animated videos in the learning of Systems of Linear Equations in Two Variables but also have a strong intention to use them again in the future, even recommending them to friends. This finding reinforces that locally-based animated video media has sustainable potential in supporting students' learning processes.

The findings of this study reinforce Davis' (1989) postulate that perceived usefulness is a major factor in technology acceptance. The high PU scores align with the results of Scherer et al.'s (2019) meta-analysis, which showed that perceived usefulness consistently serves as a significant predictor of the intention to use educational technology. These findings also align with Al-Marroof & Al-Emran's (2021) research, which found that students are more likely to accept digital learning technology if it is perceived as relevant and beneficial to the learning process.

From a contextual perspective, students' positive acceptance of the Majalengka-based local wisdom animation video supports the findings of Sukmawati & Hidayat (2021) and Mauladaniyati et al. (2025) that the integration of ethnomathematics in learning media can enhance students' understanding and engagement. This shows that the use of local wisdom not only adds to the appeal of the media but also strengthens the connection between the abstract concept of Systems of Linear Equations in Two Variables and students' real lives.

4. CONCLUSION

The use of Majalengka local wisdom-based animated videos in teaching Systems of Linear Equations in Two Variables was very well received by students, as indicated by the results of the analysis of the four TAM constructs (PU, PEOU, ATU, and BIU) in the high category. These findings indicate that the developed media are beneficial, easy to use, enjoyable, and capable of increasing students' interest in continuing to use them. From a theoretical perspective, the research results reinforce the relevance of TAM in measuring the acceptance of educational technology, while practically providing an alternative contextual learning medium that teachers can adopt. The limitations of the study lie in the limited number of respondents and the focus of the material On Systems Of Linear Equations In Two Variables, so further research is recommended to expand the sample, assess the impact on learning outcomes, and develop similar media on other materials to obtain a more comprehensive picture.

ACKNOWLEDGEMENTS

The authors would like to express their sincere gratitude to Universitas Sindang Kasih Majalengka for the support and facilitation provided during the research process. Appreciation is also extended to SMA Daarul Amanah for granting permission and providing the opportunity to conduct this study with their students. The authors are also grateful to their academic supervisors for their guidance and constructive feedback throughout the preparation of this article. Finally, sincere thanks are addressed to all students who participated in this research for their valuable contributions and active involvement.

REFERENCES

- Arikunto, S. (2013). *Research Procedures: A Practical Approach*. Jakarta: Rineka Cipta.
- Cece, A., & Dian, K. (2023). The effect of using animated videos on students' interest in learning mathematics. *International Journal of Educational Research and Review*, 3(2), 88–99.
- Clark, J. M., & Paivio, A. (1991). Dual coding theory and education. *Educational Psychology Review*, 3(3), 149–210.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.

- Höffler, T. N., & Leutner, D. (2007). Instructional animation versus static pictures: A meta-analysis. *Learning and Instruction*, 17(6), 722–738.
- Kieran, C. (2007). Learning and teaching algebra at the middle school through college levels. In F. K. Lester Jr. (Ed.), *Second handbook of research on mathematics teaching and learning* (pp. 707–762). Charlotte, NC: Information Age Publishing.
- Nugroho, A., & Irawati, D. (2021). The effectiveness of animated video media to improve mathematical problem-solving ability. *Journal of Mathematics Education*, 12(1), 45–56.
- OECD. (2023). *PISA 2022 Results (Volume I): The State of Learning and Equity in Education*. Paris: OECD Publishing.
- Scherer, R., Siddiq, F., & Tondeur, J. (2019). The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. *Computers & Education*, 128, 13–35.
- Sukmawati, D., & Hidayat, A. (2021). Exploration of Ethnomathematics in the Panyaweuyan Terraced Farming System as a Context for Algebra Learning. *Proceedings of the National Seminar on Mathematics Education*, Majalengka.
- Suryadi, D. (2022). Analysis of difficulties faced by high school students in West Java in solving two-variable linear equation systems (SYSTEMS OF LINEAR EQUATIONS IN TWO VARIABLES). *West Java Mathematics Education Journal*, 15(2), 45-58.
- Teo, T. (2009). Modeling technology acceptance in education: A study of pre-service teachers. *Computers & Education*, 52(2), 302–312.
- Van de Walle, J. A., Karp, K. S., & Bay-Williams, J. M. (2019). *Elementary and middle school mathematics: Teaching developmentally* (10th ed.). New York, NY: Pearson.