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Validity of STEM-Based Physics Learning Video on Parabolic Motion for Senior High School Students

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ABSTRACT

Purpose of the study: This article will focus on the validity criteria, with the aim of this research being to assess the extent to which the physics learning media specific to the parabolic motion subtheme in the form of videos developed can be considered valid.

Methodology: This study used research and development (R&D) with the Alessi and Trollip model. The data collection technique was carried out through a validation sheet instrument conducted by 5 expert validators. The development of learning videos was carried out for class XI Senior High School 22 Palembang.

Main Findings: The assessment of the content aspect of the material resulted in a CVI value of 0.93. Furthermore, the evaluation of the media presentation aspect attained a CVI score of 1, and the validation of the productivity and innovation aspects of the material also scored 1. Since the CVI scores are all at 1, it can be inferred that the instructional video created is both valid and appropriate for educational purposes.

Novelty/Originality of this study: This research makes a real contribution in answering the needs of modern learning with the STEM approach and AI technology. The results of this media validation are expected to be a reference for further research and become an inspiration for educators in developing innovative learning media.

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1. INTRODUCTION

One of the fields of science that plays a functional role in changing times is physics. Physics lessons require a strong understanding of concepts. If students do not understand the concepts taught, they will face difficulties in solving problems related to the material [1]. Research by Paramitasari et al., [2] identified that parabolic motion material is one of the topics that is difficult to understand. This difficulty arises because the nature of the material is considered abstract, and many students prefer to memorize formulas rather than understand the concept [3]. Therefore, it is important to prepare physics learning well so that the results are maximized. One way to overcome this challenge is to use learning media, which can facilitate the teaching process for teachers and students, especially on the topic of parabolic motion [4].

Learning media has a very important role in the teaching and learning process. In the context of teaching, teachers often utilize learning media as a tool to convey material, so that students can understand

better [5], [6]. But teachers must also pay attention to the media used. Media selection must consider conditions related to the existing situation and the abilities possessed by students [7]. Learning media includes various forms, such as tools, means, and communication channels, which can be used by students and educators to support and facilitate learning activities, so that learning outcomes can be achieved effectively and efficiently [8]-[10]. Likewise, according to Learning media refers to tools or sources used in the educational process to convey information between teachers and students, with the aim of achieving the desired learning outcomes [11]. Therefore, teachers are required to utilize technology as learning media and develop various forms of learning media to convey information in the teaching and learning process [12]. Several social media platforms such as Google Classroom, Google Meet, Zoom, Facebook, and YouTube are options that can be used as learning tools. The use of video media in learning has proven to be more interesting than other media [13].

Video as a learning tool is very flexible and offers advantages in terms of practicality and portability [14]. Video-based learning media presents material in an audio-visual format, where learning messages or content can be watched and listened to simultaneously [15], [16]. The use of video media in the learning process has a number of advantages, including increasing learners' knowledge and developing logical and analytical thinking skills [17]. The addition of symbols in the form of words and sentences accompanied by images and audiovisual elements can facilitate the delivery of messages from the sender [18]. Research conducted by Nurwahidah et al., [19] shows that the use of learning video media can increase students' motivation, achievement, and interest in learning, because videos are able to display situations or learning experiences that are relevant to the material. Through connecting the material presented with the daily experiences experienced by students [20]. In addition, learning videos also serve to help students understand complex material [21]. While video has been an effective tool in education, artificial intelligence has the potential to revolutionize the way we create and distribute video content. The rapid advancement of video editing technology today is heavily influenced by the development of artificial intelligence (AI).

Artificial intelligence (AI) has undergone significant development, from simply assisting in animation creation to contributing to more complex visual designs [22]. The use of AI in animation includes creating more responsive characters, more realistic movements, and more dynamic narratives. The integration of AI in the animation production process not only increases efficiency but also encourages innovation. intelligent systems can play a role in the creation of characters, storyboards, and scenarios, thus speeding up and simplifying the production process. With advancements in artificial intelligence, video processing is now moving towards automation, where automated video editing methods based on AI algorithms are able to process multiple videos quickly.

There is research entitled learning media in the form of videos that are valid for use in the previous learning process, concluding that the feasibility of learning videos for power point-based effort and energy material [23]. Learning videos have the effect of increasing interest and understanding of concepts in pressure material [24]. In addition, the successful development of creating contextualized learning videos for fluid material for high school students [25]. In the same context with the title "development of powtoon-based physics animation video on global warming material" which shows that learning media in the category is very feasible according to experts [26]. In this regard, under the title "development of interactive physics learning videos on hydrostatic pressure material" this video is stated based on validation from material, media, and language experts, this learning video has been deemed suitable for use, with an average score obtained o f 72%, 73%, and 73% respectively, this indicates that all three aspects meet the criteria for good feasibility [27].

Considering this description, this research focuses on the development of AI-assisted STEM-based learning videos on parabolic motion material to train high school students' critical thinking skills. In principle, the development of physics learning media must meet three main criteria: valid, practical, and effective. This article will focus on the validity criteria, with the aim of this research being to assess the extent to which the physics learning media specific to the parabolic motion subtheme in the form of videos developed can be considered valid.

2. RESEARCH METHOD

This study uses research and development (R&D). The validity process of learning media in the form of learning videos is obtained through three stages out of four stages. Alesi and Trolip's development model, namely analyzing learning needs, then determining learning objectives and designing learning videos, as well as developing learning videos involving material experts, learning design experts, and learning media experts as validators. This development was carried out with the target users being high school students. The selection of material experts is based on the competence of expert subjects, namely lecturers.

The defining stage consists of two sub-stages namely needs analysis and determining learning objectives. Furthermore, the planning stage consists of three sub-stages namely topic development, drafting, and prototype production. The development stage consists of four sub- stages namely production, validation, analysis and revision, and testing. Then the last is the dissemination stage. The development of learning videos was

carried out for class XI of Senior High School 22 Palembang in the odd semester of the 2024/2025 school year. The learning media validation sheet used as an instrument in this study consists of four aspects of assessment. These aspects include assessment of material content, video display aspects, and innovation/knowledge aspects. The validation process involved five lecturers who assessed the aspects holistically. The video validity assessment was conducted using a guttman scale, which included several categories, namely 0 (not suitable) and 1 (suitable). In this study, the questionnaire employed to gather data on content validity was structured with response categories of "Yes" or "No." The responses provided by the panelists were subsequently analyzed by converting their answers, assigning a value of 1 for "Yes" and a value of 0 for "No." The validation results used the content validity ratio (CVR) approach. The formula for calculating CVR [28] is as follows.

$$CVR = \frac{ne - \frac{N}{2}}{\frac{N}{2}} \quad \ldots.(1)$$

Table 1. Critical CVR scores can be categorized

Number of Validators	CVR critical value
5	0.736
6	0.672
7	0.622
8	0.582

Table 2. Criteria for validity of CVI calculation results

Range	Category
0.00 – 0.33	Invalid
0.34 – 0.67	valid
0.68 – 1.00	Very valid

3. RESULTS AND DISCUSSION

The physics material used in the development of this AI-assisted STEM-based learning video is grade 11 high school material, namely on the subtheme of parabolic motion. which is included in the kinematics chapter according to the independent curriculum book. AI helps students in explaining the process of parabolic motion and the concept of parabolic motion and related phenomena which previously tended to be presented in a 2-dimensional or written form such as modules, books were transferred to develop them in a more attractive form, and equipped with animation, background, audio explanation with avatar animation characters. Planning, design, and development are three stages in product development. The process and results of each stage can be seen below.

3.1. Assessment on the material content aspect

The product validation stage in this study was carried out through the use of learning media on parabolic motion material presented in the form of videos. This research was conducted at Senior High School 22 in Palembang City. Validation of physics learning media in the form of videos was carried out by five experts, namely lecturers who are competent in the field of physics education. This validation process was carried out holistically on lecturers who are competent in physics by paying attention to aspects of material content, aspects of video display, and aspects of productivity/material innovation. The assessment of each indicator from the content and material construction aspects is presented in Table 3.

Table 3. Per-Indicator Assessment on the material content aspect

No.	Aspects assessed	CVI	Description
1	Clarity of learning objectives.	1	Very valid
2	Suitability of material with basic competencies	1	Very valid
3	Suitability indicators student development learning with level	1	Very valid
4	The video contains stimuli for students to respond to the video (preparetools write,listen to the material, answer questions)	1	Very valid
5	The material presented is in accordance with the subject matter	1	Very valid

6	The systematic presentation of material on the video is in accordance with curriculum	1	Very valid
7	STEM analysis is in accordance with the material coverage	0.6	Very valid
8	Suitability indicators critical thinking skills learning with level	0.6	Valid
9	Suitability of material content with learning objectives	1	Very valid
10	The suitability of the illustrations presented with the material.	1	Very valid
11	The explanation of the material on the video is clearly displayed.	1	Very valid
12	The language used is in accordance with language rules Indonesian and easy to understand (communicative).	1	Very valid
	CVI value	0.93	Very valid

Based on the results of the validation of the material content aspect has 10 indicators obtained Based on the results of the validation, the aspects assessed on the content of the material have a score of 1. This means that the material used in the video is very valid. However, there are shortcomings seen in 2 indicators of STEM analysis and the suitability of indicators with the level of critical thinking skills by obtaining a score of CVI is 0,6 meaning that it needs to be improved especially in that section. In other words, overall from the aspects of content and construction, the material used in this physics learning video is classified as very valid.

3.2. Assessment on the aspect of video media display

In addition to the material content aspect, the next aspect assessed on the video display was 7 indicators. All indicators of video media aspects displayed in this physics learning video are classified as very valid criteria. The assessment of each indicator of the video display aspect is presented in Table 4.

Table 4. Per-Indicator Assessment on the aspect of video media display

No.	Aspects assessed	CVI	Description
1	Interesting learning video display	1	Very valid
2	Appropriateness of choosing font size and shape.	1	Very valid
3	Accuracy of the music or song accompanying the learning video	1	Very valid
4	Readability of the text on the video	1	Very valid
5	Text layout on the video	1	Very valid
6	Sound quality on video	1	Very valid
7	Image quality on video	1	Very valid
	CVI value	1	Very valid

Based on table 4. The media aspect of physics learning videos is very valid. The assessment on each indicator obtained its CVI value is 1, this means the category is very valid. This learning video is very good, both from the appearance, appropriate fonts, sound quality, image quality, and readability of the text on the video. However, there are several components that need to be improved on the video, including the speed of the video to make it a little slower and the need to add learning outcomes at the beginning of the video as a reference for students in learning the learning video content.

3.3. Assessment on aspects of material productivity and innovation

The validation aspect of material productivity and innovation has 3 indicators by obtaining an assessment from the validator worth 1 or agree. The assessment of all indicators from the aspect of material productivity and innovation is shown in Table 5.

Table 5. Per-Indicator Assessment on aspects of material productivity and innovation

No.	Aspects assessed	CVI	Description
1	The material is presented by several examples of phenomena that occurs in everyday life (contextual)	1	Very valid
2	Video can foster enthusiasm for learning, curiosity know, and students' interest in learning	1	Very valid
3	Able to add new insights for students	1	Very valid
	CVI value	1	Very valid

Based on table 5, the aspects of material productivity and innovation are classified as very good. Valid from all indicators. The CVI value obtained is 1, indicating that the each of these indicators is very goodm because it has appeared in accordance with the aspects of in learning videos. This in line with the opinion according to Nieveen [29], it is important for learning tool to be based on content validity. Construct, in addition, its quality must meet established validity standards.

Learning videos have a number of significant benefits, including help learners understand the material and provide opportunities for students to learn. repeating material that may have been forgotten. The use of video in the learning process teaching can optimize the time available in the classroom, thus enabling exploration of the material in greater depth and breadth. Validation showed that the video physics learning about parabolic motion is feasible to be applied in learning activities. The creation of learning videos is driven by various reasons, given the many benefits it offers. The use of videos as learning media has been proven to be more effective in helping students understand the material compared to just reading the text [30]. In addition, for educators, learning videos provide several advantages, including: (1) increasing educators' creativity; (2) increasing the number of copyrights owned by educators; (3) strengthening educators' personal branding; (4) reducing teacher fatigue in teaching [31]. In other words, it is clear that the use of audio-visual learning media, such as videos, provides many valuable benefits. These include helping students understand and clarify the material delivered by the teacher, as well as making it easier for teachers in the teaching and learning process, both in schools and in distance learning [32]. The development of learning videos is also very important because it can improve students' critical thinking skills, solve problems, and make physics learning more interesting [33]. In accordance with this development as a process carried out with awareness, careful planning, and clear goals, aims to create or improve something [34]. Through this process, it is hoped that a more useful product can be produced, which will support and improve quality, as an effort to achieve better quality.

4. CONCLUSION

The results of data analysis from the validation sheet filled out by five experts show that the AI-assisted STEM-based learning video on parabolic motion material to train critical thinking skills meets the eligibility criteria in terms of material and is included in the very valid category. The feasibility of media display has also been met, with criteria classified as very valid. In addition, the feasibility of productivity and innovation has met the criteria which are also classified as very valid. Overall, the average assessment of the five validators shows that the learning media in the form of videos developed has met the eligibility criteria and can be considered very valid and suitable for use in the learning process.

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REFERENCES

[1] M. A. Sonia, C. M. M. Maing, and M. U. J. Mukin, "Analisis Kemampuan Pemahaman Konsep Fisika Materi Tekanan Pada Siswa Kelas VIII C SMPN 3 Kupang," *Magnet. J. Inov. Pembelajaran Fis. UNWIRA*, vol. 1, no. 1, pp. 23–27, 2023, doi: 10.30822/magneton.v1i1.2044.

[2] W. Paramitasari, H. Permana, and H. Nasbey, "Video Animasi Materi Gerak Parabola Berbasis Problem Based Learning Dilengkapi Dengan Phet Simulation," vol. XI, pp. 81–88, 2023, doi: 10.21009/03.1102.pf12.

[3] T. P. Heryani, I. R. Suwarma, and D. T. Chandra, "Development of STEM-Based Physics Module with Self-Regulated Learning to Train Students Critical Thinking Skills," *J. Penelit. Pendidik. IPA*, vol. 9, no. 6, pp. 4245–4252, 2023, doi: 10.29303/jppipa.v9i6.3578.

[4] M. Ikhbal and H. A. Musril, "Perancangan Media Pembelajaran Fisika Berbasis Android," *Inf. Manag. Educ. Prof. J. Inf. Manag.*, vol. 5, no. 1, p. 15, 2020, doi: 10.51211/imbi.v5i1.1411.

[5] A. P. Wulandari, A. A. Salsabila, K. Cahyani, T. S. Nurazizah, and Z. Ulfiah, "Pentingnya Media Pembelajaran dalam Proses Belajar Mengajar," *J. Educ.*, vol. 5, no. 2, pp. 3928–3936, 2023, doi: 10.31004/joe.v5i2.1074.

[6] A. Amaliah, Adnan, and A. A. Azis, "Pengembangan E-book Berbasis Studi Kasus Pada Materi Perubahan Lingkungan Kelas X SMA," *Biosf. J. Biol. dan Pendidik. Biol.*, vol. 1, no. 7 No 1, 2022, doi: 10.23969/biosfer.v7i1.5630.

[7] S. M. Siahaan and R. E. Putri, "The Augmented Reality Based Flashcards for Learning Heat and Thermodynamics in High School," *J. Penelit. Pengemb. Pendidik. Fis.*, vol. 10, no. 1, pp. 99–108, 2024, doi: 10.21009/1.10109.

[8] M. Rurut, J. Waworuntu, and T. Komansilan, "Pengembangan Media Pembelajaran Matematika Berbasis Mobile di Sekolah Dasar," *Edutik J. Pendidik. Teknol. Inf. dan Komun.*, vol. 2, no. 2, pp. 212–223, 2022, doi: 10.53682/edutik.v2i2.4562.

[9] S. Pratasik and B. M. Ahyar, "Pengembangan Media Pembelajaran Pada Mata Pelajaran Informatika MTS," *Edutik J. Pendidik. Teknol. Inf. dan Komun.*, vol. 2, no. 3, pp. 359–373, 2022, doi: 10.53682/edutik.v2i3.5282.

[10] M. H. Pasaribu and T. Listiani, "Optimalisasi Media Pembelajaran Online Dalam Mendorong Keaktifan Belajar Siswa

Pada Kelas Matematika [Optimization of Online Learning Media To Encourage Students' Active Learning in Mathematics Class]," *JOHME J. Holist. Math. Educ.*, vol. 5, no. 1, p. 44, 2021, doi: 10.19166/johme.v5i1.2855.
[11] W. Wahyuni, M. Iqbal, F. Rizani, and N. Najmuddin, "Penerapan Media Pembelajaran Budaya Sekolah Islami Berbasis Multimedia," *J. TIKA*, vol. 8, no. 1, pp. 33–39, 2023, doi: 10.51179/tika.v8i1.1891.
[12] M. Ediyani, U. Hayati, S. Salwa, S. Samsul, N. Nursiah, and M. B. Fauzi, "Study on Development of Learning Media," *Budapest Int. Res. Critics Inst. Humanit. Soc. Sci.*, vol. 3, no. 2, pp. 1336–1342, 2020, doi: 10.33258/birci.v3i2.989.
[13] T. Asih and P. Ujianti, "Inovasi Video Pembelajaran Berbantuan Aplikasi Powtoon pada Materi Keliling dan Luas Bangun Datar," *Mimb. PGSD Undiksha*, vol. 9, no. 3, p. 375, 2021, doi: 10.23887/jjpgsd.v9i2.36665.
[14] M. N. Rahmi and M. A. Samsudi, "Pemanfaatan Media Pembelajaran Berbasis Teknologi sesuai dengan karakteristik Gaya Belajar," *Edumaspul J. Pendidik.*, vol. 4, no. 2, pp. 355–363, 2020, doi: 10.33487/edumaspul.v4i2.439.
[15] G. N. I. P. Pratama, N. Hidayat, and I. Wahyuni, "Peningkatan Keterampilan Pembelajaran Micro Teaching Berbasis Viduk (Video Unjuk Kerja) Pada Mahasiswa Pendidikan Teknik Sipil Dan Perencanaan, Ft, Uny," *J. Pendidik. Tek. Sipil*, vol. 2, no. 1, pp. 13–23, 2020, doi: 10.21831/jpts.v2i1.31967.
[16] R. S. Ridwan, I. Al-Aqsha, and G. Rahmadini, "Pemanfaatan Media Pembelajaran Berbasis Video dalam Penyampaian Konten Pembelajaran," *Inov. Kurikulum*, vol. 18, no. 1, pp. 38–53, 2020, doi: 10.17509/jik.v18i1.37653.
[17] E. Regiani, F. N. Auliah, and N. Febriyanti, "Pembelajaran Berbasis Video sebagai Inovasi Pendidikan di Era Revolusi 4.0," *Nat. J. Kaji. dan Penelit. Pendidik. dan Pembelajaran*, vol. 8, no. 1, pp. 90–96, 2023, doi: 10.35568/naturalistic.v8i1.2211.
[18] M. R. Apriansyah, "Pengembangan Media Pembelajaran Video Berbasis Animasi Mata Kuliah Ilmu Bahan Bangunan Di Program Studi Pendidikan Teknik Bangunan Fakultas Teknik Universitas Negeri Jakarta," *J. PenSil*, vol. 9, no. 1, pp. 9–18, 2020, doi: 10.21009/jpensil.v9i1.12905.
[19] C. D. Nurwahidah, Z. Zaharah, and I. Sina, "Media Video Pembelajaran Dalam Meningkatkan Motivasi Dan Prestasi Mahasiswa," *Rausyan Fikr J. Pemikir. dan Pencerahan*, vol. 17, no. 1, 2021. doi: 10.31000/rf.v17i1.4168
[20] J. Zhang, G. Liao, and N. Li, "Combining active learning and local patch alignment for data-driven facial animation with fine-grained local detail," *Neurocomputing*, vol. 398, pp. 431–441, 2020, doi: 10.1016/j.neucom.2019.05.102.
[21] E. H. N. Sugini and A. Basit, "Pengaruh Media Pembelajaran Berbasis Animasi terhadap Minat Belajar Peserta Didik Kelas VII SMP Islam Alimuddin Kabupaten Probolinggo," *J. Ilm. Mimb. Demokr.*, vol. 19, no. 02, pp. 28–31, 2020, doi: 10.21009/jimd.v19i02.14616.
[22] M. Tang and Y. Chen, "AI and animated character design: efficiency, creativity, interactivity," *Front. Soc. Sci. Technol.*, vol. 6, no. 1, pp. 117–123, 2024, doi: 10.25236/fsst.2024.060120.
[23] A. Reski, I. D. Palittin, and R. Astutik, "Pengembangan Video Pembelajaran Fisika Materi Usaha Dan Energi Berbasis Powerpoint," *JPF (Jurnal Pendidik. Fis. Univ. Islam Negeri Alauddin Makassar*, vol. 10, no. 2, pp. 107–112, 2022, doi: 10.24252/jpf.v10i2.29642.
[24] S. Aswara, F. D. Amanda, and R. Fitriani, "Pengaruh Media Pembelajaran Fisika Berbasis Video untuk Meningkatkan Minat dan Pemahaman Konsep Materi Tekanan Siswa SMAN 2 Sungai Penuh," *Integr. Sci. Educ. J.*, vol. 3, no. 1, pp. 16–23, 2022, doi: 10.37251/isej.v3i1.173.
[25] A. Patricia, I. M. Astra, and F. Bakri, "Video Pembelajaran Yang Kontekstual Untuk Materi Fluida Di Sma," vol. XI, pp. 321–326, 2023, doi: 10.21009/03.1102.pf44.
[26] M. I. B. Perdana, V. Serevina, and R. Raihanati, "Pengembangan Buku Pengayaan Pengetahuan Elektronik Gempa Bumi Tektonik dari Sudut Pandang Fisika untuk Siswa SMA/ MA," *Lontar Phys. Today*, vol. 1, no. 2, pp. 97–102, 2022, doi: 10.26877/lpt.v1i2.11287.
[27] P. Video, P. Fisika, and I. Pada, "Schrodinger," vol. 3, no. 2, pp. 98–106, 2022.
[28] C. Ayre and A. J. Scally, "Critical Values for Lawshe ' s Content Validity Ratio : Revisiting the Original Methods of Calculation," no. October, 2015, doi: 10.1177/0748175613513808.
[29] Z. Riva'i, N. Ayuningtyas, and A. Fachrudin Dhany, "Pengembangan Media Pembelajaran Berbasis Aplikasi Android pada Materi Himpunan Kelas," *Delta-Pi J. Mat. dan Pendidik. Mat.*, vol. 9, no. 2, pp. 106–119, 2020, doi: 10.33387/dpi.v9i2.2277.
[30] M. Kamlin and T. C. Keong, "Adaptasi Video dalam Pengajaran dan Pembelajaran," *Malaysian J. Soc. Sci. Humanit.*, vol. 5, no. 10, pp. 105–112, 2020, doi: 10.47405/mjssh.v5i10.508.
[31] I. G. Rasagama, "Pengembangan Model Pembelajaran Getaran Berbasis Video Youtube Untuk Meningkatkan Pemahaman Konsep Mahasiswa Politeknik," *J. Pendidik. Sains*, vol. 8, no. 2, p. 91, 2020, doi: 10.26714/jps.8.2.2020.91-101.
[32] D. Roy, S. Tripathy, S. K. Kar, N. Sharma, S. K. Verma, and V. Kaushal, "Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic," *Asian J. Psychiatr.*, vol. 51, no. April, p. 102083, 2020, doi: 10.1016/j.ajp.2020.102083.
[33] D. A. N. Cahaya, "Pengembangan video pembelajaran untuk melatih membaca siswa," vol. XI, pp. 247–252, 2023.
[34] D. Agustina and V. M. Sceisarriya, "Pengembangan alat pukul (loban) dan bola kasti (serpa) sebagai media untuk menarik minat siswa bermain kasti kelas IV MI Nurul Huda Gandusari Development of a bat (loban) and baseball (serpa) as media to attract students' interest in playing baseball for ," *J. PHEDHERAL*, vol. 19, no. 2, pp. 58–62, 2022, doi: 10.20961/phduns.v19i2.64453