# Content validity of D-MESS: Articulate storyline 3-based learning media in sport massage courses

*by* Gede Doddy Tisna Ms

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# Content validity of D-MESS: Articulate storyline 3-based learning media in sport massage courses

**Gede Doddy Tisna MS[abcd]*, Ketut Chandra Adinata Kusuma[abe], I Wayan Muliarta[abc], Gede Eka Budi Darmawan[abe]**

**Universitas Pendidikan Ganesha, Indonesia**

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**ABSTRACT**

The development of innovative learning media is one of the solutions for educators in the learning process in higher education in the current era of digital and technological disruption. Interactive learning media are relevant to be applied in hybrid or blended learning methods. The purpose of this study was to find out the results of validating D-MESS content as an interactive learning medium in sports massage courses. The data used in this study are quantitative data obtained from questionnaires filled out by learning experts, media experts, and programming experts. The data analysis technique used is quantitative descriptive, which is oriented towards the Content Validity Index (CVI) approach. The results of the validation test on D-MESS show that, from the educational aspect, a value of 0.89 is obtained, on the aspect of program display, a value of 0.91, and on the aspect of technical quality, a value of 0.83. Referring to these results, the interactive learning media for the sports massage course, which is named D-MESS, has a high level of validation, both from the educational aspect, program appearance, and technical quality. So that the relevance of all components of the three aspects, such as curriculum suitability, content of learning materials, interaction, feedback, coloring, graphics, sound, animation, display between screens, ease of use, and program security, is very good, even though there are minor revisions. Furthermore, with this very high D-MESS validation value, it is suggested for future research.

**Keywords:** Content validity; interactive learning media; sports massage

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**Corresponding Author:** Gede Doddy Tisna MS, Department of Sport Science, Faculty of Sport and Health, Universitas Pendidikan Ganesha, Singaraja, Indonesia
Email: gd.doddy@undiksha.ac.id

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## INTRODUCTION

The use of digital learning media, digital platforms, technological innovation, and IT infrastructure is no longer an option but a necessity (Dewi et al., 2019; Al-Kahtani et al., 2022). Utilization of learning technology will improve the quality of education (Awaluddin et al., 2021). The COVID-19 pandemic resulted in a transition in learning patterns, namely from face-to-face learning to distance learning (Sun et al., 2020; Rozi et al., 2021; Yao et al., 2022). The pandemic certainly has a negative impact on all educational settings (Kusuma & Hamidah, 2020). Processes that are felt by students, teachers, and parents, as well as a decrease in access to educational facilities. Technology utilization is crucial in the post-Covid-19 era, one of which is

the application of hybrid learning or online learning (Kabassi et al., 2016). Technological sophistication provides assurance of facilities for distance learning on a large scale (Holland, 2019). Educators have a very vital role in implementing hybrid learning, starting from planning activities, learning organization, implementation, and the evaluation stage, in an effort to improve the learning process in the post-COVID-19 pandemic, one of which is by implementing the use of appropriate learning media in the learning process (Saifulloh & Darwis, 2020). The application of hybrid learning must be supported by good learning media (Ismanto et al., 2022).

Good learning media are those that are interactive, contextual, varied, and able to stimulate students to be directly involved in their use (Sugiharni, 2018). Utilization of learning media that is integrated with technology could be used effectively in the learning process based on hybrid learning (Akbar et al., 2022). Learning media is also a tool for conveying material in learning and is able to stimulate the motivation, conceptual understanding, and attention of students so that learning objectives can be achieved (Byusa et al., 2022), and attention of students so that learning objectives could be achieved (Yuliani et al, 2020). Learning media also make learning more interesting so that it makes students interested in participating in learning (Wahid et al., 2020). In the learning process at the university, the use of digital technology as a learning medium could broaden student learning experiences, especially in terms of independence and critical thinking (Wang et al., 2018; Zarei et al., 2021), and also could support a quality and more meaningful learning process (Rasvani & Wulandari, 2021).

The sports massage course at the Faculty of Sports and Health, Universitas Pendidikan Ganesha, is a course that requires every student to have knowledge and skills in the field of sports massage therapy. The scope of material in sports massage learning consists of the history of sports massage, the benefits of sports massage, massage management, anatomy and physiology of the body, manipulation in massage, sports massage, and sports massage manipulation (Salvo, 2023). The characteristics of this course are theory as the basis for learning and practice as an implementation of the theory that has been mastered. With the scope of the material and the characteristics of these courses, it is important for an innovative learning medium to be developed as support in the post-pandemic learning process. The intended innovative learning media are more appropriate for today's students who belong to the millennial generation, namely, the generation born in the digital age who always take advantage of advances in information technology in their lives (Rastati, 2018). This generation is commonly referred to as the Z generation, with its main characteristics being having an interest in new technology and wanting convenience in using it (Priporas et al., 2017).

The use of innovative learning media will attract more students' interest, create a pleasant learning atmosphere, and enable students to learn effectively (Dwiqi et al., 2020). The material presented with the video has an impact on students' memories and also makes students interested in learning (Yu, 2022). The learning process that uses video (with an attractive appearance or features) as a learning media is proven to be effective in improving student learning outcomes, and some of it can replace the traditional learning approach played by class-based teachers (Nurwulan et al., 2020). Video media in online learning strategies is more interesting and more conducive to increasing student enthusiasm to be active in class and could increase student knowledge (Li, 2022).

Previous studies have tried to develop instructional media that take advantage of developments in information technology or digital technology, such as the development of sports massage learning media in the form of interactive multimedia packaged using DVDs to improve the learning outcomes of Physical and Health Education students at FIK UM (Kurniawan, 2021) as well as those based on Android (Efendy et al., 2022), the development of video-assisted interactive multimedia models (Utomo & Wahyudi, 2021), and the development of an articulate storyline based on massage therapy (Kurniawan & Amiruddin, 2022). But, there has been no previous research that has developed interactive learning media that can be used both online and offline in sports massage learning and in accordance with the character of future target users, namely the Z generation. This effort is expected to provide further research direction regarding the development of innovative and interactive learning media for sports massage lectures that have high validity. The learning media that will be used must have high validity so that it has credibility as a support for learning. Because

validity is also an important factor in the selection and implementation of learning in the field or in research (Almanasreh et al., 2019; Koller et al., 2017).

The follow-up effort referred to above is that the researcher develops an articulate storyline for 3-based learning media called D-MESS. The difference between D-MESS and MESS is that MESS is designed for users with an audio-visual learning style. As well as D-MESS provides practice questions for its users to measure their knowledge about sports massage. The main advantage of using articulate storyline 3 is that they can be published offline or online, supported by simple smart brainware with interactive tutorial procedures to help users format CDs, personal websites, and word processing through templates published both offline and online (Darmawan, 2016). Articulate Storyline is a 3-based media that has a PowerPoint-like appearance but has advantages compared to PowerPoint. It has the feature of adding characters, various kinds of quizzes, url links, and buttons; there are also layers that could separate one object from another; there are triggers that function to direct the button to where we want it; besides that, it also has various publish formats such as LMS (Sari & Harjono, 2021).

Articulate Storyline 3 also has other advantages, such as ease of use and support for various formats, including HTML5, to produce attractive tutorial presentations. Articulate Storyline 3 in the form of web-based media could also be run on various devices, such as software on tablets, laptops, and applications on smartphones (Putnama & Retnowati, 2020). Multimedia based on Articulate Storyline 3 is easy to use, just by sharing the link via the Google Drive link or an application that the user could download independently. With the interactive media of Articulate Storyline 3, we will foster the self-regulated learning of students. This could be identified by increasing the ability to solve problems and tasks independently with monitoring by educators as facilitators (Wong et al., 2019). Articulate Storyline 3 could also improve critical thinking skills and increase students' independence (Heliawati et al., 2022). Android-based interactive learning media using Articulate Storyline 3 could be used as a learning resource and supporting media for distance learning (Rohmah & Bukhori, 2020). Based on the explanation, the purpose of this research is to describe the level of validity of D-MESS, which is an interactive learning media based on Articulate Storyline 3 in sports massage courses, from the aspect of media content. The quality of learning media developed must go through an applicable standard, one of which must meet a good level of validity before being tried on small groups or large groups (Hadza et al., 2020).

## METHOD

Content validity is interpreted as a process of measuring the extent to which the content of the test matches its purpose (Sireci & Faulkner-Bond, 2014). At the content validity assessment stage, it is characterized by the a priori efforts of the researchers or developers and the posteriori efforts of the experts to evaluate the proposals of the developers or researchers whose relevance to the realm of product content is being assessed (Squires et al., 2011; Larsson et al., 2015; Santoyo-Sánchez et al., 2022). So that later experts will determine the value and validity of the content of a product. Furthermore, the interactive learning media based on Articulate Storyline 3 for the sports massage course was named D-MESS, tested by three experts, and the results were analyzed using the Content Validity Index (CVI) approach. The results of the analysis based on CVI will later be described in the form of a validity classification as proposed by Guilford (Sugiharni, 2018). More details about the classification can be seen in Table 1.

**Table 1. Validity Classification Based on CVI**

| No. | Score | Information |
|---|---|---|
| 1 | 0.80 < rxy < 1.00 | Very high validity (very good) |
| 2 | 0.60 < rxy < 0.80 | High validity (good) |
| 3 | 0.40 < rxy < 0.60 | Medium validity (enough) |
| 4 | 0.20 < rxy < 0.40 | Low validity (less) |
| 5 | 0.00 < rxy < 0.20 | Very low validity (very less) |
| 6 | rxy < 0.000 | Invalid |

The three experts who tested the content validation consisted of an education technology lecturer, an information technology lecturer, and a sports massage learning lecturer from the Universitas Pendidikan Ganesha. The instrument used in data collection is a questionnaire, so the data collected is quantitative and qualitative. While the data analysis technique used is a quantitative descriptive technique.

## RESULTS AND DISCUSSION

The D-MESS, which has been designed but is still in prototype form, is then assessed by three validators consisting of media experts, programming experts, and sports massage experts. The display of the successfully designed D-MESS prototype could be seen in Figures 1-3. Based on Figure 1, you could see the initial display and menu page. In figure 2, the menu material and developer profile are shown. Figure 3 depicts the quiz menu display.


**Figure 1. Initial View and Menu Page**


**Figure 2. Display of Material Menu and Developer Profile**

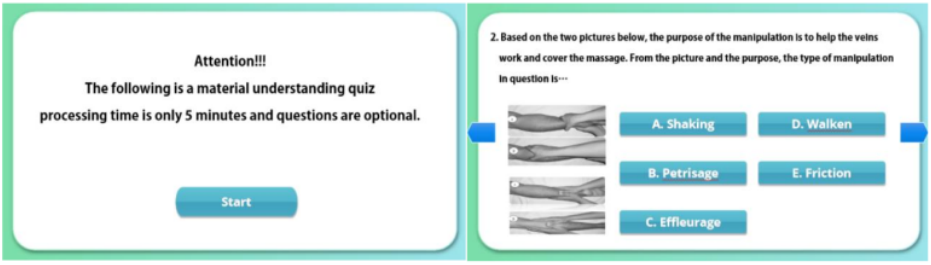


**Figure 3. Evaluation/Quiz Menu Display**

Furthermore, the three validators tested the validity of the D-MESS content, which was divided into three aspects. The first aspect is the educational aspect, which is relevant to the applicable curriculum at the Faculty of Sports and Health at Universitas Pendidikan Ganesha. The second aspect is the display of the program, namely assessing the interface display of D-MESS. The interface display in question is everything related to the physical appearance of the media, such as the suitability or alignment of the animation used, color selection, sound, and graphics. The third aspect is technical quality, namely operational procedures or how to use the program from the media. The validator's assessment is outlined in a questionnaire that has been prepared based on the questionnaire grid in Table 2.

**Table 2. Questionnaire Grid Based on Learning Media Criteria**

| No. | Learning Media Criteria | Instrument Items |
|---|---|---|
| 1 | Educational Criteria | |
| | a. Instructional | 1, 2 |
| | b. Curriculum | 3, 4 |
| | c. Content of matter | 5, 6 |
| | d. Interactions | 7 |
| | e. Feedback | 8, 9 |
| | f. Treatment of errors | 10, 11, 12 |
| 2 | Display Program | |
| | a. Coloring | 1, 2 |
| | b. Text layouts | 3 |
| | c. Screen layouts | 4, 5 |
| | d. Graphics | 6, 7 |
| | e. Animations | 8, 9 |
| | f. Sound | 10, 11 |
| | g. Menu commands | 12, 13 |
| | h. Interface design | 14 |
| 3 | Technical Quality | |
| | a. Operation program | 1, 2 |
| | b. User reactions | 3, 4, 5 |
| | c. Safety program | 6, 7, 8 |
| | d. Supplementary materials | 9, 10 |

If the validator returns a score of 1, it is relevant, and a score of 0 is irrelevant. The recapitulation of the validation results based on educational aspects is presented in table 3.

**Table 3. Validation Results Based on Educational Aspects**

| Items | Expert 1 | Expert 2 | Expert 3 | Amount | I-CVI |
|---|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 2 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 3 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 4 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 5 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 6 | 1 | 1 | 0 | 2 | 2/3 = 0.67 |
| 7 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 8 | 1 | 1 | 0 | 2 | 2/3 = 0.67 |
| 9 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 10 | 1 | 0 | 1 | 2 | 2/3 = 0.67 |
| 11 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 12 | 0 | 1 | 1 | 2 | 2/3 = 0.67 |
| ∑ | 11 | 11 | 10 | Mean I-CVI | 0.89 |
| Relevant proportions | 0.92 | 0.92 | 0.83 | | |

Based on the data presented in table 3 above, it could be seen that the validation value from the educational aspect shows an average I-CVI of 0.89. Then the scores of the relevant proportions of the first expert and the second expert each were 0.92; the third expert's score was 0.83. This shows that D-MESS has very high validity based on educational aspects, even though there are minor revisions. Furthermore, the validation results for aspects of the program display are presented in Table 4. The display of the program on interactive learning media is one of the attractions for users, so it becomes the second aspect that is assessed for validation.

**Table 4. Validation Results Based on Program Display Aspects**

| Items | Expert 1 | Expert 2 | Expert 3 | Amount | I-CVI |
|---|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 2 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 3 | 1 | 0 | 1 | 2 | 2/3 = 0.67 |
| 4 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |

| Items | Expert 1 | Expert 2 | Expert 3 | Amount | I-CVI |
|---|---|---|---|---|---|
| 5 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 6 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 7 | 1 | 1 | 1 | 2 | 2/3 = 0.67 |
| 8 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 9 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 10 | 1 | 0 | 1 | 2 | 2/3 = 0.67 |
| 11 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 12 | 0 | 1 | 1 | 2 | 2/3 = 0.67 |
| 13 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 14 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| ∑ | 12 | 12 | 14 | Mean I-CVI | 0.91 |
| Relevant proportions | 0.86 | 0.86 | 1.00 | | |

Based on the validation results of the validators shown in Table 4, the average I-CVI from the aspect of program appearance is 0.91. While the relevant proportion score given by the first expert and the second expert is 0.86 and the third expert is 1.00, so it could be said that D-MESS has very high validity in terms of the program's appearance. Table 5 below shows the results of the D-MESS validation based on technical quality aspects.

**Table 5. Validation Results Based on Technical Quality Aspects**

| Items | Expert 1 | Expert 2 | Expert 3 | Amount | I-CVI |
|---|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 2 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 3 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 4 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 5 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 6 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 7 | 1 | 1 | 1 | 3 | 3/3 = 1.00 |
| 8 | 1 | 0 | 1 | 2 | 2/3 = 0.67 |
| 9 | 1 | 0 | 0 | 1 | 1/3 = 0.33 |
| 10 | 0 | 0 | 1 | 1 | 1/3 = 0.33 |
| ∑ | 9 | 8 | 9 | Mean I-CVI | 0.83 |
| Relevant proportions | 0.90 | 0.80 | 0.90 | | |

Looking at the results in table 5 above, the average I-CVI from the aspect of technical quality from D-MESS is 0.83, and if you look at the relevant proportion value of the first expert, it is 0.90, the second expert, 0.80, and the third expert, 0.90. Based on these technical quality aspects, D-MESS is stated to have very high validity. So from the three validated aspects, namely the educational and learning aspect, the program appearance aspect, and the technical quality aspect, this interactive learning media has very high or very good validity.

Disruption in the world of education currently requires educators or learning technology developers to be able to develop or create creative and innovative learning media (Warsita, 2017). D-MESS, which has been declared to have a very high validation value, is indeed designed to answer this problem. The high validation value of the media is due to the ease with which it is used or accessed, the suitability of the contents of the material with the curriculum, its attractiveness in terms of appearance, and the fact that it is safe to use for students with various learning styles. One of the innovative learning media that is ready to be used as a distance learning media is D-MENBOLA (Kusuma et al., 2022). Interactive media could improve the critical thinking skills of users (students) and the skills needed by today's world (Kwangmuang et al., 2021; Rahayu et al., 2022). Students' cognitive and physical activity has also been shown to increase as a result of educators applying technology-based interactive learning media (Shi et al., 2020). However, it does not mean that learning media could completely replace the role of educators during the learning process (Sefriani et al., 2020).

Content on D-MESS that has a high level of interactiveness for its users, both educators and students, of course has an impact on the ease of access to the media, which directly makes it easier for users to understand the contents of the material (Muktiani et al., 2022). Obviously, this reinforces the findings (Choo & Taha, 2023) that interactive media is very effective and in accordance with the characteristics of its users, namely the Z generation. As technology develops today, learning in the world of education must also develop with the use of rapid technological advances that could support the achievement of competence by each individual (Hinojo-Lucena et al., 2019). So, this reinforces previous findings that learning activities must be designed and developed through innovation to increase creativity, think flexibly, and speak fluently (Ma & Corter, 2019). Educators become the leaders in the world of education related to the use of information technology-based learning media (Nyagorme et al., 2022).

Most of the courses at the sports and health faculties are in the form of field practice, one of which is sports massage. The presence of D-MESS as a solution to the lecture process in blended or hybrid learning and the fact that online practical learning in sports education is not easy to implement (Mylsidayu, 2021). The advantage of using D-MESS is that it could be accessed on PCs, laptops, smartphones, or tablets, all of which are included in the types of mobile devices that are commonly used in the online learning process (Batez, 2021). When accessing information online, adequate facilities are needed, such as good internet access (Mansur et al., 2022). The very high validation value of D-MESS also proves that the media meets the elements of interactive multimedia. Interactive multimedia is defined as the combination of sound, graphics, animation, text, and video in one computer system or media (Ayob, 2014). While the interactive element in question has also been declared relevant by the validator, from the definition of interactive, what is meant is the interaction of the instructor with students, students with other students, and students with technology both synchronously and asynchronously (Singh & Thurman, 2019). Then the relevant graphic display on D-MESS is also a reinforcement if this media is used as a learning media, because previous findings suggest that people learn better from instruction based on a mix of words and graphics than from words only (Mayer, 2017).

## CONCLUSION

Beside choosing the right learning method, the use of innovative and interactive learning media has an important role in responding to the challenges of blended or hybrid learning. Interactive learning media that are developed or created must certainly go through the testing or validation stage first. Because a learning medium that has a high validation value certainly correlates with student learning outcomes, both cognitively, affectively, and psychomotorly, so it becomes important that D-MESS is validated to find out how far along the level of validation is before the media is tested on small and large classes. The findings from this study can certainly be one of the innovative learning media for sports students who will study massage.

The limitations of this research are that the products developed are still limited to college student users and have not touched on aspects of the needs of users with disabilities. So that further research is expected to be able to develop special media for users with disabilities, and this existing media is implemented in experimental research to reveal its impact on aspects of knowledge, skills, learning motivation, or other soft skill abilities because it has a very high level of validity.

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## CONFLICT OF INTEREST

We believe consciously and carefully in this paper that there has been no conflict of interest from the time this manuscript was prepared until it was published.

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