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Jurnal Pembelajaran IPA Terpadu: PELITA 6(2), July - December 2026

Development of Socio-Scientific Issues-Based Interactive Media Assisted by the Articulate Storyline Application in Science Learning

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Abstract

The urgency of this research is to develop interactive socio-scientific issues-based media to enhance students' engagement and understanding in science learning. This study was motivated by students' low understanding of science learning, particularly the topics of elements, compounds, and mixtures, as well as the limited use of interactive and contextual digital learning media. Therefore, interactive learning media based on *Socio-Scientific Issues (SSI)* assisted by the *Articulate Storyline* application was developed. This study aimed to describe the validity and practicality levels of the developed media. The research method used was *Research and Development (R&D)* with the *ADDIE* model, which includes the *Analyze*, *Design*, *Develop*, *Implement*, and *Evaluate* stages. The research instruments consisted of material-expert and media-expert validation sheets using a 1–5 Likert scale, as well as a student-response questionnaire using a 1–5 Likert scale to measure media practicality. The population consisted of all Grade VIII students at SMP Negeri 1 Rejotangan, with a limited trial sample of 32 students from one class. The validators consisted of three material experts and three media experts. The results showed that the developed media obtained a material-expert validation percentage of 84.25% in the valid category and a media-expert validation percentage of 81.2% in the valid category. The practicality test based on the student-response questionnaire obtained 86.37% in the highly practical category. Thus, the SSI-based interactive learning media assisted by *Articulate Storyline* on the topics of elements, compounds, and mixtures was declared valid and highly practical and therefore suitable for use as science learning media for Grade VIII junior high school students. The implication of this study is that the media can serve as an alternative for science teachers to provide more contextual learning by connecting socio-scientific issues, thereby supporting conceptual understanding as well as students' sensitivity to problems in their surrounding environment. In addition, the findings can serve as a reference for future researchers to develop similar media for other science topics or to examine its effectiveness on student learning outcomes on a broader scale.

Keywords: *Articulate Storyline, Interactive Learning Media, Science Learning, Socio-Scientific Issues (Ssi).*

Introduction

The developemen of Kurikulum Merdeka has brought a shift in the learning paradigm in Indonesia by emphasizing the development of student competencies through student-centered and contextual learning and the optimal use of digital technology (Purnama, 2024 ; Zakiyah & Azizah 2025). In science learning, students are no longer expected merely to master scientific concepts theoretically, but also to connect them with various phenomena in everyday life so

https://doi.org/10.54065/pelita.6.2.2026.1853

that critical-thinking, problem-solving, and scientific-literacy skills can be developed (Putra, 2022). Science learning in the 21st century is also directed toward developing students who are able to make decisions based on scientific evidence and who demonstrate concern for various social and environmental issues (Purwandari et al., 2024). In line with these demands, the use of digital learning media has become an important factor in improving the quality of the learning process. Interactive learning media can provide more engaging learning experiences, increase learning motivation, and help students understand abstract concepts through visual, audio, and interactive simulation presentations (Anitasari & Utami, 2022 ; Haryanti et al, 2026). In addition to increasing students' interest in learning, digital media also provide opportunities for students to learn independently according to their individual learning pace (Hafiedz & Nurhamidah, 2023).

Nevertheless, science learning in schools still faces various problems. Based on observations at SMP Negeri 1 Rejotangan, learning on the topics of elements, compounds, and mixtures is still dominated by the use of textbooks as the main learning resource. Not all students have textbooks, making the learning process less optimal. In addition, teachers still tend to use conventional teaching methods because of limited time to develop interactive digital learning media. This situation is compounded by limited laboratory facilities, so practical activities on basic chemistry topics cannot be implemented optimally. Consequently, students tend to memorize concepts without understanding the relationships among concepts or their applications in everyday life. This condition contributes to low learning motivation and limited understanding of elements, compounds, and mixtures, as also reported by previous studied, who found that learning motivation has a significant relationship with student learning outcomes (Budiariawan, 2019).

Elements, compounds, and mixtures are fundamental chemistry topics with abstract characteristics that often create learning difficulties for students (Rahmadhani et al., 2025 ; thoms et al, 2026). Concepts such as the classification of substances, the structure of matter, and the differences among elements, compounds, and mixtures require effective visualization to be easily understood. If these topics are presented only through verbal explanations or textbooks, students may have difficulty developing a comprehensive conceptual understanding. Therefore, innovative learning media are needed to visualize these concepts more concretely while connecting them with real problems in students' surrounding environment (Lailimuniffah et al., 2023).

One approach considered appropriate for creating contextual science learning is *Socio-Scientific Issues (SSI)*. The SSI approach integrates scientific concepts with social issues developing in society so that students not only understand scientific concepts but are also able to consider social, ethical, environmental, and economic aspects when making decisions (Putra, 2022). Through this approach, students are invited to analyze real-world problems, such as pollution caused by mercury waste, the use of synthetic chemicals in food, and other environmental issues directly related to the topics of elements, compounds, and mixtures (Okmarisa & Nabila, 2025; Nabilah et al., 2026). SSI-based learning has also been shown to improve critical thinking, scientific argumentation, and students' environmental awareness (Purwandari et al., 2024).

For the SSI approach to be implemented optimally, learning media are needed that can integrate various multimedia components into a unified learning experience (Milda et al., 2026). One software application with such potential is *Articulate Storyline*. This application enables developers to present material through combinations of text, images, video,

animation, interactive quizzes, simulations, and automatic feedback that can increase student engagement during the learning process (Anitasari & Utami, 2022). In addition to its attractive interface, media developed using *Articulate Storyline* are flexible because they can be accessed via computers and smartphones, both online and offline, making them suitable for the characteristics of learning in the digital era (Hafiedz & Nurhamidah, 2023). Previous studies have also shown that the use of *Articulate Storyline* can improve learning motivation, learning outcomes, and student independence through more interactive learning experiences (Fadhillah & Octarya, 2023). Various previous studies have developed *Articulate Storyline*-based learning media and other interactive learning media. For example, the previous studied developed *Articulate Storyline* media that improved students' learning motivation and outcomes, but the material was still designed in a general manner without integrating specific socio-scientific issues (Fadhillah & Octarya, 2023).

Likewise, demonstrated the advantages of *Articulate Storyline* in terms of visual attractiveness and access flexibility, but their development focus remained limited to technical aspects and concept visualization and did not address the social, ethical, or environmental dimensions of the material taught (Anitasari & Utami, 2022; Hafiedz & Nurhamidah, 2023). On the other hand, studies using the SSI approach, such as, have demonstrated its effectiveness in improving students' critical thinking and environmental awareness, but these studies have not implemented SSI in the form of *Articulate Storyline*-based interactive digital media, particularly for the topics of elements, compounds, and mixtures at the junior high school level (Purwandari et al. 2024 & Okmarisa et al., 2025). This condition is also supported by the findings who reported that media developed in previous studies generally emphasized the delivery of scientific concepts without linking them to social issues close to students' lives, resulting in learning that remained insufficiently contextual (Oktaviana et al. 2026).

Based on the description above, the identified research gap is the absence of *Articulate Storyline*-based interactive learning media for Grade VIII junior high school topics on elements, compounds, and mixtures that explicitly integrate the *Socio-Scientific Issues (SSI)* approach. Previous studies have tended to separate the development of technically and visually oriented *Articulate Storyline*-based media from the implementation of the contextually and socially oriented SSI approach. Consequently, an integrated learning-media product combining both aspects has not yet been identified, particularly one designed to support understanding of the abstract concepts of elements, compounds, and mixtures.

The novelty of this study lies in the development of *Articulate Storyline*-based interactive learning media specifically designed to integrate SSI, such as pollution caused by mercury waste and the use of synthetic chemicals in food, into Grade VIII material on elements, compounds, and mixtures. Unlike previous studies that generally focused only on visual attractiveness and the technical interactivity of the media, the product developed in this study presents learning content intentionally designed to encourage students to analyze real socio-environmental phenomena while constructing scientific concepts. Thus, the learning becomes more contextual, relevant to everyday life, and aligned with the requirements of Kurikulum Merdeka. This novelty distinguishes the study from similar previous research both in terms of integrating SSI content into the topics of elements, compounds, and mixtures and in terms of its specific development target of Grade VIII junior high school students.

Based on these problems, this study developed interactive learning media based on *Socio-Scientific Issues (SSI)* assisted by the *Articulate Storyline* application for Grade VIII junior high school topics on elements, compounds, and mixtures. The developed media were

designed to present the material in a more engaging, interactive, and contextual manner so as to increase student involvement in learning while helping teachers provide digital learning media that are consistent with the characteristics of Kurikulum Merdeka. This study contributes to the development of science learning media by integrating the SSI approach with digital technology through the *Articulate Storyline* application. The resulting product is expected to serve as a valid and practical alternative learning medium that can support science learning, particularly for Grade VIII topics on elements, compounds, and mixtures.

Based on this background, the research questions are: (1) what is the validity level of interactive learning media based on *Socio-Scientific Issues (SSI)* assisted by the *Articulate Storyline* application for Grade VIII junior high school topics on elements, compounds, and mixtures, and (2) what is the practicality level of the developed learning media based on student responses? This study aimed to describe the validity level of interactive learning media based on *Socio-Scientific Issues (SSI)* assisted by the *Articulate Storyline* application for Grade VIII junior high school topics on elements, compounds, and mixtures and to describe the practicality level of the developed learning media based on student responses.

Method

This study used the *Research and Development (R&D)* method to produce interactive learning media based on *Socio-Scientific Issues (SSI)* assisted by the *Articulate Storyline* application for Grade VIII junior high school students on the topics of elements, compounds, and mixtures. The development model used was the *ADDIE* model (*Analyze*, *Design*, *Develop*, *Implement*, and *Evaluate*). This model was selected because it provides systematic stages that are appropriate for learning-media development.

The *Analyze* stage was conducted by identifying learning problems, analyzing student characteristics, analyzing media needs, and analyzing the curriculum used at the school. The *Design* stage included developing a storyboard, designing the media interface, preparing the learning material, designing navigation, and developing the research instruments. The *Develop* stage involved creating the media using the *Articulate Storyline* application, after which the product was validated by material experts and media experts and revised according to the validators' suggestions. The *Implement* stage was then conducted through a limited trial with students to determine the practicality level of the media based on user responses. The final stage, *Evaluate*, was carried out formatively at each development stage to address product shortcomings and produce learning media suitable for use in the learning process.

The participants in this study consisted of validation participants and product-trial participants. The validation involved six validators, consisting of three material experts and three media experts. The validators were science education lecturers from Universitas Bhinneka PGRI and practitioner teachers with competencies relevant to their respective fields. The validation assessed the appropriateness of the material content, learning presentation, media appearance, navigation, interactivity, and the feasibility of using the media in learning. The product-trial participants were 32 Grade VIII students at SMP Negeri 1 Rejotangan. The limited trial was conducted after the media had been declared valid by the validators. The trial aimed to obtain information about the practicality of the learning media based on student responses after using the interactive learning media based on *Socio-Scientific Issues (SSI)*.

Research Instruments and Data Collection

The research instruments consisted of a material-expert validation sheet, a media-expert validation sheet, and a student-response questionnaire. The material-expert validation sheet was used to assess the alignment of the material with learning outcomes, conceptual accuracy, material presentation, language, and the integration of the *Socio-Scientific Issues (SSI)* approach into the learning media. The media-expert validation sheet was used to assess appearance, interface design, navigation, ease of use, multimedia quality, interactivity, and the suitability of the media as a learning tool. The student-response questionnaire was used to determine the practicality level of the media after its use in learning activities. The assessed aspects included ease of use, clarity of material presentation, visual attractiveness, ease of navigation, the perceived benefit of the media for understanding the material, and students' interest in participating in learning using the developed media.

All research instruments were developed using a four-point Likert scale consisting of strongly agree, agree, disagree, and strongly disagree. Data from expert validation and student responses were analyzed using quantitative descriptive analysis by calculating the percentage of the obtained score relative to the maximum score. The resulting percentages were then interpreted according to the established validity and practicality criteria to determine the feasibility category of the developed learning media. The data obtained in this study were quantitative data derived from material-expert validation, media-expert validation, and student-response questionnaires. Data were analyzed using quantitative descriptive techniques by calculating the percentage obtained from each research instrument. The percentage calculation was used to determine the validity and practicality levels of the developed learning media.

The percentages from material-expert and media-expert validation were then interpreted according to the media-validity criteria to determine the feasibility level of the developed product. Next, student-response questionnaire results were analyzed using the same technique to determine the practicality level of the learning media. The higher the percentage obtained, the higher the feasibility level of the media as a learning medium. The interpretation criteria for media validity and practicality referred to the guidelines established in the study. The criteria for media validity and practicality are presented in Table 1. Adapted from (Nabilah et al., 2026).

Table 1. *Criteria for the Validity Level of Learning Media*

Percentage (%)	Category
81% - 100%	Highly Valid
61% - 80%	Valid
41% - 60%	Fairly Valid
21% - 40%	Less Valid
0% - 21%	Invalid

Based on these criteria, the learning media were considered feasible if they obtained a valid or highly valid category and could therefore proceed to the student-trial stage. The criteria for the practicality level of the learning media are presented in Table 2. Adapted from (Irawan & Hakim, 2021).

Table 2. *Criteria for the Practicality Level of Learning Media*

Percentage (%)	Category
81% - 100%	Highly Practical
61% - 80%	Practical
41% - 60%	Moderately Practical

Percentage (%)	Category
21% - 40%	Impractical
0% - 21%	Highly Impractical

The practicality analysis was used to determine the ease of use of the learning media based on student responses. The media were considered to have good practicality if they obtained a practical or highly practical category and were therefore suitable for use as learning media for the topics of elements, compounds, and mixtures.

Results

The resulting product was interactive learning media based on *Socio-Scientific Issues (SSI)* assisted by the *Articulate Storyline* application for Grade VIII junior high school topics on elements, compounds, and mixtures. The media included a learning menu, learning materials, videos, interactive quizzes, educational games, and the integration of social issues relevant to students' everyday lives.

Analysis Stage (Analyze)

The analysis stage was conducted through observations and interviews with the science teacher at SMP Negeri 1 Rejotangan. The analysis showed that science learning on the topics of elements, compounds, and mixtures still faced several constraints, including limited interactive learning media, insufficient visualization of concepts, low student engagement, and limited availability of textbooks, projectors, and internet access. These conditions caused learning to remain dominated by books and direct teacher explanation. Based on the analysis results, learning media were needed that could visualize concepts more concretely, were easy to use, and were able to connect science material with real-world problems through the *Socio-Scientific Issues* approach. The developed media also needed to include navigation, visual materials, games, and interactive exercises to increase student engagement.

Design Stage (Design)

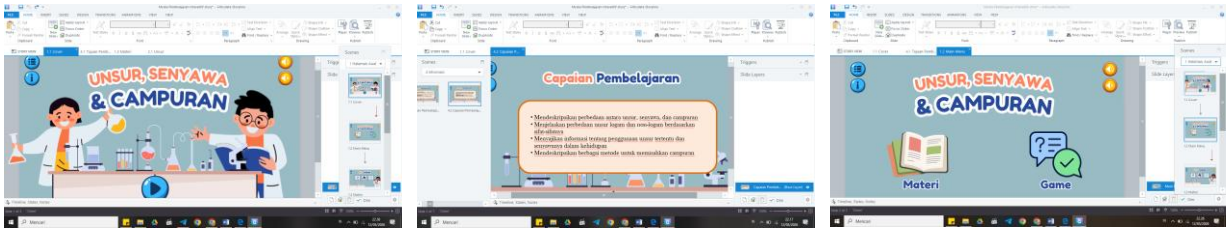
At the design stage, the researchers developed a storyboard, navigation structure, *slide master*, information layers, and media background design. The storyboard served as a guide for determining page order, the sequence of material presentation, button positions, and relationships among sections of the media. The navigation structure was designed to facilitate user access to the main menu, learning materials, games, and supporting information. Based on this design, the researchers developed a *slide master* to maintain consistency in layout, color combinations, fonts, navigation buttons, and visual elements on each page. Information layers were designed to contain usage instructions and supporting information, while the background design was adjusted to the topic theme and the characteristics of junior high school students. The entire design served as a guide before the media were developed using the *Articulate Storyline* application.

Development Stage (Develop)

At the development stage, the planned design was realized as interactive learning media using the *Articulate Storyline* application. The resulting product included the initial interface and media navigation, presentation of *Socio-Scientific Issues (SSI)*-based material, interactive games, supporting pages, and product publication. After the initial product had been developed, the media were validated by material experts and media experts to obtain improvement suggestions and determine their validity level.

Initial Interface and Media Navigation

The initial interface and media navigation consisted of a cover page, a learning-outcomes page, and a main menu. The cover page served as the opening display and contained the media title, a three-line button to open the *slide menu*, an information button, a background-sound settings button, and a "Play" button to begin learning. The learning-outcomes page contained the competencies students were expected to achieve on the topics of elements, compounds, and mixtures in accordance with Kurikulum Merdeka. The media also included a learning-objectives page that served as a guide for developing the material content and learning activities. The main-menu page then provided access to the material and game menus so that students could select the learning features they wished to use.



(a) Cover Page *(b) Learning Outcomes* *(c) Main Menu*

***Figure 1**. Main Interface and Features of the Learning Media*

Figure 1 shows that the initial media interface was designed using consistent combinations of colors, illustrations, icons, and navigation buttons. The cover page directs users to begin learning, the learning-outcomes page provides information about the competencies to be achieved, and the main menu functions as the central access point to the material and interactive games. The consistency of the layout and navigation elements across these three pages was intended to make the media-use flow easy for students to understand.

Presentation of Socio-Scientific Issues-Based Material

After accessing the main page, students are directed to the material menu, which contains options for elements, compounds, and mixtures. Each option is equipped with interactive navigation buttons so that students can select and move from one topic to another according to their learning needs. The material was systematically organized based on the established learning objectives. Its presentation used a combination of text, images, and animations in the *Articulate Storyline* application. The *Socio-Scientific Issues (SSI)* approach was integrated through the presentation of contextual issues, explanations of the relationship between the issues and science concepts, and analyses of the problems from multiple perspectives. The media also included guiding questions and comprehension checks to encourage students to express opinions based on scientific information.



(a) Material Presentation *(b) Relationship Between SSI and Material* *(c) Multi-Aspect Perspective*

***Figure 2.** Presentation of SSI-Based Material*

Figure 2 shows that the material not only presents the concepts of elements, compounds, and mixtures but also connects them with real problems in everyday life. Socio-scientific issues are used as a context so that students can understand the application of science concepts while examining problems from scientific, environmental, social, health, and economic perspectives. This presentation is intended to create more contextual learning and encourage students to consider various types of information before responding or making decisions.

Interactive Games

The media included educational games related to the topics of elements, compounds, and mixtures. The games were designed to provide interactive learning activities while helping students evaluate their understanding of the material. Each game included instructions, navigation buttons, scores, and feedback on the answers provided.

Supporting Pages and Product Publication

The media also included a reference page, a list of image sources, and developer information. The reference page was used to list the sources of the learning material, while the image-source list contained the sources of the illustrations used in the media. The developer-information page contained the developer's identity, study program, and institution as a form of accountability for the developed product. The product was subsequently published through the *Itch.io* platform so that it could be accessed online using a web browser. This publication facilitated distribution and use of the media by teachers and students. Through the publication page, users can access learning materials, videos, games, quizzes, and learning exercises without having to install the *Articulate Storyline* application.

Product Revisions Based on Validator Suggestions

The developed product subsequently underwent a validation stage to assess the feasibility of the learning media. Before assigning scores to the product, the validators first provided suggestions and feedback as a basis for improvement. Based on these suggestions and comments, the researchers revised the developed product. The validation process involved six validators consisting of three material experts and three media experts. Each validator assessed the media using the prepared validation instrument while also providing suggestions and comments as the basis for product refinement. The revisions made based on the validators' notes and suggestions are described below.

Table 3. *Product Revisions Based on Validator Suggestions*

No.	Aspect	Validator Suggestion	Product Revision
1	Learning objectives	Color contrast needs to be improved	Increase contrast between text and background
2	Material symbols	Symbols do not yet accurately represent the concepts	Adjust the symbols for elements, compounds, and mixtures
3	Comprehension check	No answer space or contextual questions are available	Add answer fields and real-world phenomena
4	SSI presentation	An explanation of SSI is not yet available	Add a definition of SSI and a concept map
5	Games	Scores are not yet available	Add scores and feedback
6	Video	Learning videos are not yet available	Add learning videos

Table 3 presents the product revisions made based on suggestions provided by the validators. Several aspects of the learning product were revised to improve its quality, clarity, and effectiveness. In the learning objectives section, the color contrast between the text and

background was improved to enhance readability. The material symbols were adjusted to more accurately represent the concepts of elements, compounds, and mixtures. The comprehension check was improved by adding answer fields and contextual questions related to real-world phenomena. In the SSI presentation, a definition of Socioscientific Issues (SSI) and a concept map were added to provide clearer conceptual understanding. The game section was enhanced by adding scores and feedback to increase student engagement, while learning videos were also added to support students' understanding of the material. Overall, these revisions were implemented to address validator feedback and improve the usability, clarity, and instructional value of the product.

Expert Validation Results

After the product was revised based on the validators' suggestions and comments, the learning media were reassessed to determine their validity level. The validation involved three material experts and three media experts. The material-expert assessment covered the substance of the material content, integration of the *Socio-Scientific Issues (SSI)* approach, systematic presentation, and language. A summary of the material-expert validation results for each aspect is presented in Table 4.

***Table 4**. Summary of Material-Expert Validation Results*

No.	Assessment Aspect	Number of Indicators	Average Percentage (%)	Category
1	Substance of material content	5	87,60	Highly Valid
2	Integration of the SSI approach	5	82,20	Highly Valid
3	Systematic presentation	5	84,80	Highly Valid
4	Language	5	82,40	Highly Valid
Overall average		20	84,25	Highly Valid

Based on Table 4, the material-expert validation results obtained an overall average percentage of 84.25% in the highly valid category. The material-content substance aspect received the highest score of 87.60%, whereas integration of the SSI approach received the lowest score of 82.20%, but remained in the highly valid category. These results indicate that the material was aligned with the learning scope, curriculum, learning objectives, presentation systematics, and student characteristics. Nevertheless, the accuracy of factual information and consistency in presenting socio-scientific issues still require attention in further product refinement.

Media-expert validation was conducted by three validators across five assessment aspects: media design, multimedia quality and interactivity, language use, ease of use and accessibility, and technical feasibility. A summary of the media-expert validation results for each aspect is presented in Table 5.

***Table 5.** Summary of Media-Expert Validation Results*

No.	Assessment Aspect	Number of Indicators	Average Percentage (%)	Category
1	Media design	5	84,80	Highly Valid
2	Multimedia quality and interactivity	3	79,67	Valid
3	Language use	5	80,80	Valid
4	Ease of use and accessibility	5	78,20	Valid
5	Technical feasibility of the media	2	83,00	Highly Valid
Overall average		20	81,20	Highly Valid

Based on Table 5, the media-expert validation results obtained an overall average percentage of 81.20% in the highly valid category. The media-design aspect received the highest score of 84.80%, indicating that the appearance, layout, color combinations, and illustrations were appropriate for the characteristics of learning media. Meanwhile, ease of use

and accessibility received the lowest score of 78.20% in the valid category. These results indicate that the media were suitable for use but still required refinement, particularly in access across various devices, response speed, and ease of use without special assistance. At the indicator level, the lowest score of 66% was found for the media's ability to be accessed across different devices, indicating that compatibility and access flexibility should receive attention during product refinement.

Implementation Stage (Implement)

At the implementation stage, the researchers conducted a practicality test after the learning media had been declared valid by the validators. The limited trial involved 32 Grade VIII students at SMP Negeri 1 Rejotangan who had studied the topics of elements, compounds, and mixtures using the developed media. The purpose of the practicality test was to determine the ease of use of the media based on students' direct experience during the learning process. Practicality was assessed using a student-response questionnaire covering several aspects: ease of media use, clarity of material presentation, visual quality, ease of navigation, the perceived benefit of the media for understanding the material, and students' interest in participating in learning using *Socio-Scientific Issues (SSI)*-based media.

Practicality Test Results

The practicality test was conducted with 32 students after they had used the interactive learning media based on *Socio-Scientific Issues (SSI)*. The student-response questionnaire results were classified according to the media-practicality levels presented in Table 6.

Table 6. *Practicality Test Results of the Learning Media*

No.	Category	Percentage Range	Frequency	Percentage of Students
1	Highly Practical	81–100%	28	87,50%
2	Practical	61–80%	4	12,50%
3	Moderately Practical	41–60%	0	0,00%
4	Impractical	21–40%	0	0,00%
5	Highly Impractical	0–20%	0	0,00%
	Total		32	100,00%
	Overall average		86,09%	Highly Practical

Based on Table 6, 28 students, or 87.50%, rated the media in the highly practical category, while four students, or 12.50%, rated them in the practical category. The overall average percentage of 86.09% indicates that the learning media were in the highly practical category. These results suggest that the media were easy to use and received positive student responses in terms of appearance, navigation, material presentation, and interactive features. Therefore, the SSI-based interactive learning media assisted by the *Articulate Storyline* application were considered practical for use in Grade VIII junior high school learning on the topics of elements, compounds, and mixtures.

Evaluation Stage (Evaluate)

The evaluation stage was conducted formatively at each stage of development. Evaluation was carried out by reviewing expert-validation results and product-trial results. Validator feedback was used as the basis for refining the media, including improving the interface, refining the material, adding learning videos, developing a concept map, creating questions based on real phenomena, and improving the game features. The evaluation results showed that the interactive learning media based on *Socio-Scientific Issues (SSI)* assisted by *Articulate Storyline* met the valid and highly practical criteria and were therefore suitable for use as

science learning media for Grade VIII junior high school topics on elements, compounds, and mixtures.

Discussion

This study produced interactive learning media based on *Socio-Scientific Issues (SSI)* assisted by the *Articulate Storyline* application for Grade VIII junior high school students on the topics of elements, compounds, and mixtures. Product feasibility was examined through three indicators: material-expert validity, media-expert validity, and product practicality based on student responses. The material-expert validation results showed an average percentage of 84.25% in the valid category.

This value indicates that the substance of the material content, integration of the SSI approach, systematic presentation, and language in the developed media were consistent with curriculum requirements and learning objectives. This finding is in line with, who developed an SSI-based electronic module on additives and addictive substances and obtained material validity of 87.14% in the highly feasible category, strengthening the evidence that science teaching materials designed using the SSI approach are consistently judged valid by material experts (Lestari et al. 2023). The criterion with the lowest score in this aspect was the accuracy of factual information in the SSI context (73%), indicating the need to strengthen references and update data on the socio-scientific issues presented. Nevertheless, the criterion concerning the integration of SSI in helping students understand the relationship between science and real life remained in the highly valid category (86%), in line with, who showed that SSI-based learning had a positive effect on students' *reflective judgment (*Stephani & Tambun, 2020).

The media-expert validation results obtained an average percentage of 76.9% in the valid category, slightly lower than the material-validation result. This finding is consistent with, who developed Adobe Flash-based interactive multimedia and obtained media validity of 90.48% in the highly valid category, emphasizing that design, layout, and color combinations generally meet feasibility criteria for multimedia-based learning media (Stephani Tambun, 2020). The lowest score in media validation was for accessibility across different devices, which received 66% in the valid category. This finding is consistent with, who stated that *Articulate Storyline* has limitations in HTML-based publication outputs that cannot function independently and require additional software for optimal access across devices (Juhaeni et al., 2021). Thus, the device-compatibility constraints identified in this study represent a common characteristic of *Articulate Storyline*-based media rather than solely a weakness of the developed product, making this an important recommendation for future development of similar media, for example through more responsive *HTML5*-based publication.

The practicality test involving 32 Grade VIII students at SMP Negeri 1 Rejotangan yielded an average percentage of 86.37% in the highly practical category. This finding reinforces the results, who developed *Articulate Storyline*-based interactive learning media for Grade VIII junior high school students and obtained a practicality level of 91% (Lestari et al., 2021). As well as whose SSI-integrated interactive media achieved 87% practicality and 98% positive student responses (Yani, 2026). The similarity of these results across several studies indicates that SSI-based interactive learning media assisted by *Articulate Storyline* consistently receive positive responses from students in terms of ease of use and perceived meaningfulness of learning, because interactive features such as quizzes, navigation, and visual illustrations can increase student engagement in the learning process.

Overall, the consistency between material-expert and media-expert validation results and positive student responses strengthens the conclusion that SSI-based interactive learning media assisted by *Articulate Storyline* on the topics of elements, compounds, and mixtures are feasible and practical for use in Grade VIII science learning. Nevertheless, the currency of SSI data, media response speed, and cross-device compatibility should receive attention in future development of similar products so that the quality of SSI-based interactive learning media can be further improved.

Conclusion

This development study successfully produced interactive learning media based on *Socio-Scientific Issues (SSI)* assisted by *Articulate Storyline* for Grade VIII junior high school students on the topics of elements, compounds, and mixtures using the *ADDIE* model. The results showed that the developed media met the valid criteria based on material-expert assessment at 80.4% and media-expert assessment at 80%, and achieved a practicality level of 86% based on student responses; therefore, the media were considered suitable for use in the learning process. These findings imply that integrating the SSI approach into interactive learning media can support more contextual presentation of material, increase student engagement, and provide an innovative alternative for science learning media in line with the implementation of Kurikulum Merdeka. Nevertheless, this study has several limitations, including audio features that cannot yet run continuously when changing slides, media access that still depends on an internet connection when used through a web link, usage instructions that still require refinement, and limited variations in activities and interactive games. Therefore, future research is recommended to develop media that can be accessed optimally both online and offline, improve audio management and usage instructions, add a wider variety of interactive activities, and examine the effectiveness of the media in improving learning outcomes, critical-thinking skills, and students' scientific literacy on a broader scale.

Acknowledgment

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