

ARTICULATE STORYLINE MEDIA FOR CREATIVE THINKING OF LEARNERS ON HUMAN RESPIRATORY SYSTEM MATERIAL IN ELEMENTARY SCHOOL

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Abstract

This research aims to analyze the effectiveness of Articulate Storyline media on the human respiratory system material in Class V of SDN 3 Sukamenak. This study employs a qualitative approach with a Design-Based Research (DBR) method. Data collection techniques include observation, interviews, and questionnaires. The study involved 1 material expert and 1 media expert as validators, 1 classroom teacher as a respondent, and 31 fifth-grade students as participants. The results of the material expert validation showed a percentage of 94.05% in the "very valid" category, while the media expert validation obtained a percentage of 92.5%, also categorized as "very valid." The teacher's response to the media reached 84.62%, indicating a "good" category, while the students' response was 78.87%, also falling into the "good" category. These results indicate that the Articulate Storyline media on the human respiratory system is not only feasible for use as a learning tool but also has strong potential to enhance students' creative thinking skills. This media provides an interactive and engaging learning experience that supports the achievement of learning objectives more effectively.

Keywords: Articulate Storyline; creative thinking; human respiratory system; interactive learning media

Abstrak

Penelitian ini bertujuan untuk menganalisis efektivitas media Articulate Storyline pada materi sistem pernapasan manusia di Kelas V SDN 3 Sukamenak. Penelitian ini menggunakan pendekatan kualitatif dengan metode Design-Based Research (DBR). Teknik pengumpulan data meliputi observasi, wawancara, dan kuesioner. Penelitian ini melibatkan 1 ahli materi dan 1 ahli media sebagai validator, 1 guru kelas sebagai responden, dan 31 siswa kelas V sebagai peserta. Hasil validasi ahli materi menunjukkan persentase 94,05% dalam kategori "sangat valid", sementara validasi ahli media memperoleh persentase 92,5%, juga dikategorikan sebagai "sangat valid". Tanggapan guru terhadap media mencapai 84,62%, menunjukkan kategori "baik," sementara tanggapan siswa sebesar 78,87%, juga masuk dalam kategori "baik." Hasil ini menunjukkan bahwa media Articulate Storyline tentang sistem pernapasan manusia tidak hanya layak digunakan sebagai alat pembelajaran tetapi juga memiliki potensi kuat untuk meningkatkan keterampilan berpikir kreatif siswa. Media ini menyediakan pengalaman belajar interaktif dan menarik yang mendukung pencapaian tujuan pembelajaran secara lebih efektif.

Kata Kunci: Articulate Storyline; berpikir kreatif; sistem pernapasan manusia; media pembelajaran interaktif

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Introduction

Today's education is required not only to transfer knowledge but also to develop 21st-century skills, such as critical thinking, creativity, collaboration, and communication (Rahayu et al., 2023). In this regard, students need to be provided with the space and media that can stimulate their creative thinking potential from an early age. This is also in line with the opinion of Nadhiroh & Ahmadi (2024) that the selection of appropriate learning media is one of the key elements in fostering a learning process that is not only meaningful but also empowers students.

Interactive and engaging media can help students understand concepts more easily while encouraging them to explore new ideas independently. A enjoyable learning process creates positive experiences and sparks a high level of curiosity. Thus, the role of learning media is highly strategic in shaping students' character and higher-order thinking skills.

In the field of education, learning also plays a crucial role. Education in Indonesia often faces various challenges. This situation affects the improvement of basic education, which must be continuously pursued, and efforts to improve the quality of education at the basic level must be carried out in a sustainable and integrated manner. One approach used to improve the quality of education is the constructivist approach. The constructivist approach is used to enable students to critically think about their prior knowledge in relation to new knowledge they acquire. In this context, active participation is key to their learning. The essence of the constructivist approach is that learning is an active process (Nurfatimah Sugrah, 2020).

Field conditions indicate that not all teachers are prepared to meet the demands of learning that integrates technology and the development of creative thinking skills. Much of the learning in elementary schools is still teacher-centered and uses lecture methods with minimal exploration (Parwati & Pramatha., 2021). This results in low enthusiasm among students and limited space for imagination and the expression of new ideas. However, mastering creative thinking skills is essential for fostering an adaptive and innovative generation. According to Mannan et al. (2023), teachers' unpreparedness in managing technology-based learning is one of the main barriers to creating an active and creative classroom environment. Additionally, the limited use of varied learning media causes the learning process to be less engaging and less likely to spark students' interest and curiosity (Muis, 2021). It is important to provide solutions through the development of learning media that can bridge the needs of students with the challenges of the 21st century.

21st-century learning focuses on the dynamic use of information and technology resources, which is very different from conventional learning that relies solely on material from books and traditional delivery methods such as lectures, which tend to be monotonous. With technological advancements, educators can now utilize various digital platforms to deliver more engaging and interactive learning experiences, and provide students with access to explore information beyond what is contained in textbooks. This approach aligns with the Merdeka Curriculum (Kurikulum Merdeka) currently implemented in Indonesia, which emphasizes differentiated learning, student-centered instruction, and the development of essential competencies such as critical thinking, creativity, collaboration, and communication. Through the integration of digital media, including interactive platforms, educators are encouraged to facilitate meaningful learning that empowers students to actively construct knowledge and develop skills needed to face challenges in an ever-evolving world (Setyaningsih et al., 2020).

The use of the latest technology in learning activities is very important and crucial, due to the fact that the conventional systems currently in use are quite boring and unable to meet the needs and expectations of students in this modern era. With technology, the teaching and learning process can be more engaging, so that students are more actively involved in learning (Yudhistira et al., 2020). This has a significant impact on one of the important aspects of the learning process, namely the delivery of material. The existence and selection of appropriate learning media greatly support students in analyzing, summarizing, and concluding information in a more efficient manner, making it easier and faster for them to master the material. In the 21st century, the learning media used are increasingly diverse, encompassing various forms and

functions, and are digital-based, leveraging cutting-edge technology to create a more engaging learning experience for students (Rahmawati & Atmojo, 2021).

Based on interviews with fifth-grade students at SDN 3 Sukamenak Elementary School in Tasikmalaya City, they tend to get bored in class, making it difficult to explore their potential and hindering their ability to think creatively. One factor contributing to this is the teaching method used by teachers, which is lecture-based without the use of learning media. The learning process, particularly the material on the human respiratory system. Educational media based on applications or websites that can be used for the respiratory system material in Grade 5 include PowerPoint, Macromedia Flash, Quizizz, Powtoon, Articulate Storyline 3, and many others. The application used to create the educational media in this study is Articulate Storyline, which is one type of educational media that can be operated via a smartphone or other hardware (Asyhari & Sa'adah, 2022). Articulate Storyline is one type of media that can be used in interactive learning. This media allows the integration of various types of educational media such as video, text, or graphics, while providing interaction with users. Users can control commands or responses from this media, making it a suitable and engaging media choice. This application produces web-based media projects in Java HTML with Flash or application files (.exe), which can be run on Android-based smartphones.

From the issues presented, the researcher has gained a clear understanding of the gap between students' needs for a learning process that can provide meaningful insights as preparation for their lives, and the condition of teachers who are not up to date with current technological developments that can utilize technology to use various learning media to help students understand a subject. The researcher is interested in using the Articulate Storyline learning medium, which will package learning materials and other media such as quizzes, puzzles, games, and educational videos that are enjoyable for students.

This research aligns with several previous studies, 1) the research conducted by Husna et al. (2022) who used Articulate Storyline to determine the cognitive learning outcomes of students, which had a significant impact. The difference between Husna et al.'s (2022) study and this study is that the former was used to measure students' cognitive learning outcomes, while this study will be used to measure students' creative thinking abilities. 2) Research conducted by Febrianti et al. (2021) found that the use of Articulate Storyline media received positive responses from teachers and students. The difference between this study and the one to be conducted is that the variables used in this study were to improve learning outcomes, while in the study to be conducted, the variables are creative thinking skills.

Based on literature reviews and previous studies, students' creative thinking abilities at the elementary school level, particularly in science subjects, are still relatively low. Sitorus & Retnawati (2022) revealed in their research that only about 32% of elementary school students achieved a high level of creative thinking, particularly in developing new ideas in the context of science learning. This was also confirmed by Kurniawan et al. (2023), who found that in science learning, most students still focus on memorizing facts without developing a deep conceptual and imaginative understanding. This phenomenon reflects the suboptimal learning approach that is unable to foster an open and innovative thinking climate in the classroom. Many learning processes are still conventional, lack space for exploration, and minimally utilize interactive learning media relevant to the digital context of today's students. Therefore, it is important to present innovative solutions through the development of technology-based media, such as Articulate Storyline, which can integrate educational games, videos, narrative materials, and interactive quizzes to stimulate students' creative thinking.

This study attempts to address this gap by developing interactive learning media based on Articulate Storyline focused on human respiratory system material in fifth-grade elementary school. Unlike previous studies that emphasized cognitive aspects, this study focuses on students' creative thinking abilities as part of higher-order thinking skills (HOTS) aligned with the direction of the Merdeka Curriculum and the demands of 21st-century learning. Most previous studies have focused on the influence of media on cognitive learning outcomes and learning motivation, without comprehensively examining the role of this media in shaping students' creative thinking patterns. Therefore, there is a significant research gap, which serves as an important basis for conducting this study. The novelty of this research lies in the use of Articulate Storyline media with a composition of games, videos, narratives on the human respiratory system, and quizzes, thereby offering the advantage of being accessible anytime and anywhere by students. The urgency of this research is that students' creative thinking skills tend to be low, so changes in the learning process are urgently needed. Without changes in the learning process, students' creative thinking skills will not improve. The expected outcome of this research is that students' creative thinking skills in the subject of the human respiratory system will improve after using Articulate Storyline media.

Through this research, the researchers aim to make a real contribution to the development of interactive learning media that is relevant to the needs of students in the digital age. The use of Articulate Storyline combined with multimedia elements such as videos, quizzes, and educational games is expected to create a learning experience that is both enjoyable and challenging for students' creative thinking skills. Therefore, it is important to test the effectiveness of this media contextually through a systematic and iterative development process.

Research Methods

This research uses a qualitative approach with a research type of *Design-Based Research* (DBR). This model was chosen because it allows an iterative process of developing and evaluating learning media with the main objective of improving the quality of contextualized learning. The research was conducted in the even semester of the 2024/2025 academic year and took place at SDN 3 Sukamenak, Tasikmalaya City, specifically in class V as the main location and context for media testing. The target of this research is the development and implementation of interactive learning media based on Articulate Storyline on the material of the human respiratory system, while the research subjects include grade V students, class teachers, and experts who act as media and material validators.

The research process was carried out through four main stages in the DBR framework, namely: (1) identification and analysis of problems in the field, (2) planning and development of media prototypes, (3) implementation of media in two gradually adjusted learning cycles, and (4) reflection of results for media improvement. In the implementation stage, learners were introduced to Articulate Storyline media, then directed to use it independently, especially in the educational game section designed to stimulate creative thinking skills. The instruments used in this study include observation sheets, interview guidelines, questionnaires for teachers and students, and a rubric for assessing creative thinking skills which includes indicators of fluency, flexibility, originality, and elaboration. Data collection techniques were carried out through observation of learning activities, in-depth interviews with teachers and students, and distributing questionnaires to obtain responses to the developed media.

The collected data were analyzed through three stages, namely data reduction to filter out relevant information, data presentation in narrative and visual form, and conclusion

drawing based on pattern trends and achievement of creative thinking indicators. To ensure data validity, this study used triangulation of sources and techniques, as well as validation by media experts and material experts. With this approach, it is expected that the research results can make a real contribution to the development of innovative and effective learning media at the elementary school level. The stages of the DBR method are shown in Figure 1:

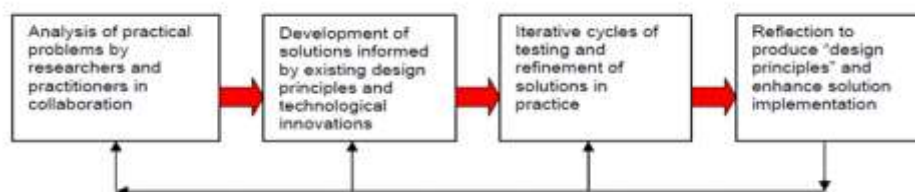


Figure 1. The stages of the DBR method

Result and Discussion

The results and discussion are described into 4 stages in accordance with the Design Based Research method, as follows:

Stage One. Problem identification and analysis Problem identification and analysis were carried out at the beginning of the research, where the researcher felt a problem that occurred. The problem of learning the Human Respiratory System at SDN 3 Sukemenak faces challenges such as declining student interest in learning, difficulty understanding abstract concepts, and lack of exploration of creative thinking skills. Although the technology infrastructure is adequate, its use is limited due to lack of planning and teacher skills. Teachers expected the interactive Articulate Storyline media, integrating visuals, audio-visuals and creative tasks to improve students' understanding and creativity. Constraints such as students' access to technology and passive learning need to be addressed to ensure media effectiveness. These findings align with Merdeka Curriculum and theories of multimedia learning, creativity, as well as technology adoption, providing a strong basis for media development in this study.

Second Stage. At this stage of the research is a stage where researchers design the entire course of the research process. This involves identifying learning objectives, selecting the appropriate media components, and preparing the necessary technical tools. Careful planning at this stage ensures that the developed media aligns with students' needs and the intended educational goals. As for this planning stage is as follows. Define the development team, the media development team is researchers and two supervisors as well as expert validators consisting of media expert validators and material experts. Determine the resources needed, in making interactive learning media using the Articulate Storyline application on the material of the Human Respiratory System, supporting technology is needed. The use of supporting technology aims to help and maximize the process of making learning media. Determining material coverage, based on the results of analyzing curriculum needs in accordance with CP and TP regarding the human respiratory system. Then the researcher determines the scope, structure, and sequence of the material. Storyboarding, making a storyboard can facilitate the process of making learning media because it describes the flow completely. Interface design, interface design is a display that has been created based on the number of flowcharts containing scenes, views, and program inputs. Prototype design, this learning media prototype is made by designing and designing to find out the product development process. Product development stage, at the development stage there are several steps that researchers take including making interactive learning media products Articulate Storyline on the material of the Human

Respiratory System, validation of material experts, instrument experts and media experts accompanied by revisions based on the assessment of experts.

The following is the Product Development Process. Download the articulate storyline app, go to the website [asrticulate.com](https://www.articulate.com) to download the Articulate Storyline application. The next step is to register for an account by clicking the box that says "Sign Up". Then, go to the "create your free account" view and select "teacher". Finally, create an account by entering the email address that will be used. Download the Articulate Storyline App and view the download results in Window Exploler. Then click Install to start the installation. When finished, it will enter the initial appearance of the Articulate Storyline application as follows:



Figure 2. Article Storyline Initial View

Create New Project. After entering the main page of the Artoculate Storyline application, select Creat New Project to create a new project, namely about making a project on the Respiratory System in Humans.

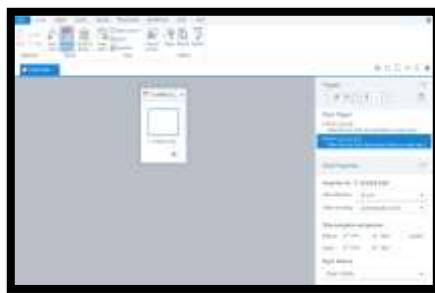


Figure 3. Initial View for New

Inserting Background and Supporting Images for the App. Input Background in the form of png and other images obtained from Google to then be tidied up and adjusted the layout. Click Insert then select Picture. After entering the image options on the computer, select the necessary images and adjust the layout.

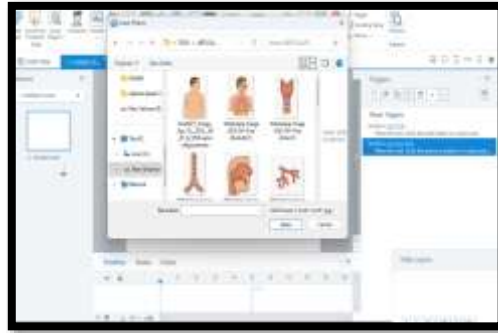


Figure 4. Required Image Input

Put music on each slide. To make each slide more interesting and motivate learners to use this application, enter music with a happy theme by clicking Insert then select Audio. Choose music that has been uploaded on the bensound.com website which is free of royalty.



Figure 5. Music Input

Give a Command or Trigger to the Button. After all the images and music are inserted, the next step is to give the command or Trigger to the Button according to the purpose and function of the Button in the slide.

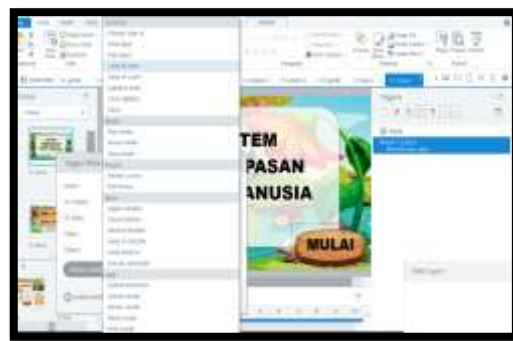


Figure 6. Triggering the Button

Publish completed projects. If all work has been completed and it is considered that all Triggers have functioned properly, the last step is to Publish the project by selecting Home then clicking Publish. Type the Application name in the Title column, and select the Publish result placement in the Folder column.

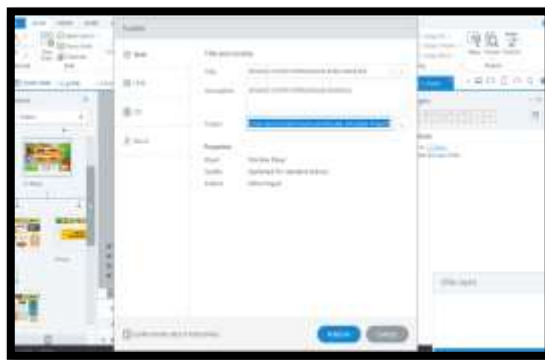


Figure 6. Publish Project

Rename the story_html5 file to index . So that the output file as a result of Publish in the Articulate Storyline application, change the story_html5 file to index.

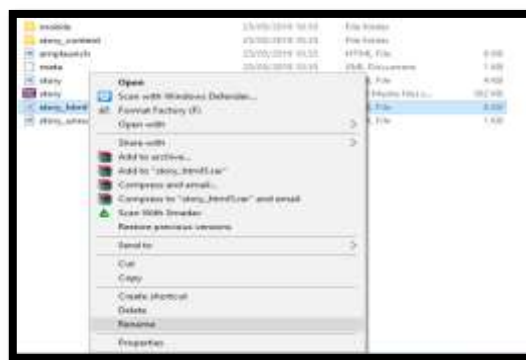


Figure 7. Renaming the story_html5 file to index

Convert articulate storyline app using web2apk builder. Open the web2apk Application Builder. Select the type to convert with Local HTML Website. Then type the name of the application to be converted in the APP Title. The last step is to click GENERATE APK.



Figure 8. Convert Articulate Storyline Application using Werb2apk Bulider

Stage Three: Iterative cycle. In repeated cycles, researchers began with the use of Articulae Storyline media which was divided into two cycles, namely the media introduction cycle and the use of Articulate Storyline media independently. These two cycles are carried out in stages. In the first cycle, namely the articulate Storyline media introduction cycle, children

will be introduced first to the features in the Articulate Storyline media with the content of the Human Respiratory System. It is tried on the child for one meeting, if the child is deemed to be able to understand well, then it will be continued to the next cycle, namely the cycle of using the media independently. In using the media independently, researchers provide opportunities for children to try all the features in the application then in the Game feature children are directed to answer open question questions which will measure the extent of the level of creative thinking skills of students after playing the game. Conversely, if the child has not been able to do this, look back at the factors around him that make the child unable to answer the open question. The teacher's response to the human respiratory system application received a score of 84.62% in the Good category. Articulate Storyline media is suitable for use in learning, with recommendations to improve interactivity (to support aspects of Interactivity that are not explicitly evaluated) and time efficiency (for aspects of Practicality and Efficiency), as well as improve the delivery of material to maximize understanding and relevance of learning. Learners' response to the human respiratory system application scored 78.87% in the Good category.

The Articulate Storyline media is suitable for use in learning, with recommendations to improve visual quality (images, text, and overall appearance) and ensure more consistent attractiveness to maximize learner motivation and engagement. The results of the Creative Thinking Skills Assessment with the Criteria for Changing the Mindset or Approach received a score of 88.67% in the Good category. These results indicate that the Articulate Storyline game is effective in developing flexible creative thinking skills, with recommendations to further encourage non-conventional ideas in the context of lung protection and assumption challenges, in order to improve scores on lower items.

The results of the Creative Thinking Skills Assessment with the Criteria for the Ability to Avoid Mental Rigidity scored 92.50% in the Good category. These results indicate that the Articulate Storyline game is very effective in developing creative thinking skills that avoid thinking rigidity, with recommendations to strengthen the ability to generate diverse systems and design tasks that more explicitly challenge old assumptions to improve scores on lower systems.

Stage Four: Reflection. This stage is the stage where researchers discuss the results of their research with creative thinking experts. The purpose of this discussion is also to get answers to questions that arise during the course of the research process, for example why this learner is not interested in using Articulate Storyline, why this learner cannot answer open-ended questions that measure the learner's creative thinking level, and so on. After completing all stages in the field, the researcher summarizes the overall results to evaluate the subject, and is also associated with the initial observation data of each child. Seen what is the relationship between the results of research and initial observations of students, as well as compared to the abilities between students, so that in the end the overall results of this study can be useful for researchers and research subjects and can be understood by many parties through writing. In this study, based on the final results, it will be narrowed down to the Human Respiratory System media in the form of an application that can be downloaded on Android, so that this media can be used for all teachers as a learning media on the Human Respiratory System meter.

Conclusion

The results showed that articulate storyline media on human respiratory system material can be used as learning media to improve students' creative thinking in elementary schools. A perfect score on the indicator of support for creative thinking (100%) is in line with this view, indicating that Articulate Storyline media is able to facilitate activities that encourage problem

solving and divergent thinking. High ratings on the indicators of attractiveness and motivation (93.33%) and ease of use (93.33%). According to Nurfajriani et al., (2020) stated that learning assisted by Articulate Storyline multimedia makes the learning process effective and efficient, so that it can improve students' creative thinking skills. According to Smaldino in Murhaini (2016), In line with the development of science and technology, the use of media, whether visual, audial, silent media projections, or motion media projections, can be carried out together and simultaneously through one tool so that students understand more easily, abstract concepts may be discussed in detail during the learning process. And also in line with Sapitri and Bentri (2020), Articulate Storyline is software that can be used for multimedia presentations or communication. Articulate storyline is one of several multi-media authoring tools that can be used to create interactive learning multimedia using content consisting of a combination of images, text, video, music, graphics, and animation. According to Arini and Asmila, (2017) who stated that in their research the creative thinking skills used are cognitive-intellectual thinking skills, where Creativity thinking skills are used in connection with emotional feelings.

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