

Development of Interactive Flipbook-Based Learning Media on Cell Material Class XI Students SMA N 01 Kotagajah

Sinta Ayu Dewi¹, Hifni Septina Carolina²

^{1,2}Institut Agama Islam Negeri Metro, Jl. Ki Hajar Dewantara No.15A, Iringmulyo, Kec. Metro Timur, Metro City, Lampung 34112

*Corresponding author: sintaayudewi2002@gmail.com

APA Citation: Dewi, S. A., & Carolina, H. S. (2024). Development of Interactive Flipbook-Based Learning Media on Cell Material for Class XI Students of SMA N 1 Kotagajah. *Quagga: Journal of Education and Biology*, 16(2), 160-167. DOI: 10.25134/quagga.v16i2.134.

Received: 09-01-2024

Accepted: 11-05-2024

Published: 01-07-2024

Abstract: 21st-century education requires teachers to be able to utilize technological advances and be more innovative in providing media to support learning activities. The use of media in the learning process has not been varied and interactive for students. The purpose of this research conducted is to produce an Interactive Flipbook-based learning media on cell material for class XI students of SMA N 01 Kotagajah which is feasible to use. This research uses the research and development method, namely Research and Development (R&D) the development model used is the ADDIE model which has five stages, namely: analysis, design, development, implementation, and evaluation. The results of the study showed that the results of validation on material experts obtained a percentage of 88% and media experts reached a percentage of 92% with very feasible criteria, this was supported by the results of responses by teachers who obtained a percentage of 90% in the "very good" category and students got a percentage of 84% in the good category. It can be stated that the Interactive Flipbook-based learning media on cell material for class XI SMA N 01 Kotagajah is very feasible to use.

Keywords: Learning Media; Interactive Flipbook; Cells.

1. INTRODUCTION

Education is an important foundation in realizing efforts to advance the nation. Education plays an important role in the development of national character and civilization (Gee & Harefa, 2021). The progress of a nation depends on the quality of its education, an intelligent nation is formed from quality education (Arisoy & Aybek, 2021); (Fau & Harefa, 2022).

The development of education in the 21st century, the field of Information and Communication Technology is progressing rapidly so the education process inevitably has to adapt to existing technological advances (Wijayanti & Isnawati, 2023). Therefore, educators are required to be able to make good use of existing technological developments as a medium for development in the field of science (Harefa et al., 2020). Educators must be

innovative in using learning media through technological advances (Mursidi et al., 2022).

Learning media is a tool that can increase effectiveness and efficiency in the learning process (Novelza & Handican, 2023). This agrees with (Batubara & Batubara, 2020) that the use of media has a positive impact on students. Media is often used by educators as an intermediary for delivering information to students which makes it easier to understand the material (Wulandari et al., 2023). Also states that the effectiveness and delivery of information can be improved by utilizing learning media (Dini Sari et al., 2017).

With reference to the results of interviews and observations that have been carried out at SMA N 1 Kotagajah, on October 6, 2023. Researchers obtained information from sources that SMA N 1 Kotagajah students have often used learning media in the form of E-Books and PowerPoint by using the method of recording

material. The lack of learning motivation in students makes them lazy to read the teaching materials that have been given. Researchers took the initiative to develop interactive flipbook-based learning media. flipbooks are presented by displaying many interesting videos along with quizzes to make students feel interested in learning. Based on observations students are allowed to use cellphones and get facilities in the form of wifi. That is why the product in the form of interactive flipbook-based learning media to explain cell material was developed by researchers.

The flipbook is a digital book that displays text, Figures, audio, animation, and videos that are designed to be as interesting as possible so that students become more enthusiastic and increase student understanding in learning activities (Sari & Ahmad, 2021). The use of interactive flipbooks has a positive impact on education, namely being able to increase students' learning activeness, being able to make the learning process more interesting so that students will feel more excited about learning, understanding the material, and increasing learning motivation (Wijayanti & Isnawati, 2023); (Juliani & Ibrahim, 2023); (Nur Aini *et al.*, 2022).

Flipbook has advantages in supporting learning activities. These advantages include: First, the presentation of various materials, attractive media displays, and is designed as attractive as possible to attract the attention of students (Mursidi *et al.*, 2022); (Wulandari *et al.*, 2023). Second, in terms of content, interactive flipbooks offer greater variety, attractiveness, and convenience than conventional learning media, so that they can present accurate information to students (Yulianto, 2022); .

In this study, researchers chose cell material which is high school grade XI material which includes cell bioprocessing and membrane transport along with cell division. This material requires a high level of understanding because the material is very large. Most students have difficulty learning the material because the material is very large and has many foreign terms. Cell material not only includes theory but also procedurally which certainly requires audiovisual to support understanding of the material. For this reason, interactive flipbook learning media is very

suitable to be applied to cell material, because interactive flipbooks can present material in the form of text, video, moving animations, and Figures (Sari & Ahmad, 2021); (Ulandari *et al.*, 2022).

By considering this, the researcher took the initiative to develop interactive flipbook-based learning media with the title "Development of Interactive Flipbook-Based Learning Media on Cell Material for Class XI Students of SMA N 01 Kotagajah".

2. RESEARCH METHOD

The method used is Research and development. This research and development research approach uses the ADDIE model which consists of five stages, namely analysis, design, development, implementation, and evaluation (Lestari & Salsabila, 2023); (Maydiantoro, 2019). In this study, the research subjects selected consisted of 10 students of class XI SMA N 1 Kotagajah, as well as one biology teacher of class XI. Data collection is taken in various ways. There are three kinds of instruments in this study, namely interviews, questionnaires, and documentation.

a. Interview

The interview is a technique of collecting information through oral interviews. In relation to this research, a meeting was conducted with the XI grade teacher of SMA N 1 Kotagajah to collect data about the learning experience in the classroom, with a focus on learning media needs.

b. Questionnaires

Questionnaires are used in testing the validity of making interactive flipbook-based learning media materials through media and material expert assessments and student and educator responses.

c. Documentation

Documentation is a written data measurement tool about facts in the field that are used as research evidence. Information can be presented in the form of Figures or photographs that aim to document the research activities that take place.

3. RESULTS AND DISCUSSION

The results of research on interactive flipbook-based learning media development on cell material for class XI students of SMA N 1 Kotagajah. Based on the stages of the ADDIE development model are as follows:

a. Analysis

The first stage includes examining needs and analyzing. Researchers made observations at SMA N 1 Kotagajah and conducted interviews with students and biology teachers. From the interview, SMA N 1 Kotagajah has used the independent curriculum. In the needs analysis, the results show that the biology teacher has a good understanding of cell material. However, it is difficult to convey cell material because it has a lot of material. Therefore, students find it difficult to understand cell material and in supporting the learning process teachers often use E-Book and PPT learning media and do not apply digital learning media. Lack of learning motivation in students makes them lazy to read the teaching materials that have been given.

b. Design

This stage is the planning stage of the Flipbook item to be made. The stages in making an Interactive Flipbook include the stages of designing an Interactive Flipbook design and compiling an Interactive Flipbook outline.

1) Making Interactive Flipbook Design

Making an Interactive Flipbook includes all the constituent components of the Interactive Flipbook, namely starting from the selection of the typeface to be used along with the font size, designing material for the Interactive Flipbook, tasks and quizzes that will be included in the Flipbook, selecting Figures and videos that match the material, as well as selecting elements and arranging cover variations for the Flipbook.

The typeface used in the Interactive Flipbook is Tropika for the big title of the Interactive Flipbook and has a size of 30 pt, League Spartan for the sub-title font measuring 18 pt, and Poly for the material explanation font measuring 22 pt. The material that will be outlined in the Interactive Flipbook is cells including cell structure & cell organelles, and cell differences. Membrane transport includes active transport, passive transport, and the relationship between membrane

transport and organisms. Cell division includes types of cell division. The quiz consists of 10 quiz questions in each material presented.

Figures contained in the material include Figures of bacterial structures, animal cells, plant cells, membrane transport processes, sodium and potassium pumps, endocytosis, phagocytosis, passive transport, diffusion mechanisms, osmosis, mitotic division, phases and processes of meiosis division, and amitotic division processes.

The video contained in the material of cell structure & cell organelles is a video of cell structure & cell organelles. Videos contained in membrane transport materials are videos of sodium and potassium pump mechanisms, endocytosis and exocytosis mechanisms, diffusion mechanisms, and osmosis. Videos contained in cell division material are videos of the phases and processes of mitotic division, phases, and processes of meiosis division, phases of the amitotic division process, and videos of onion root observations. The color on the Interactive Flipbook cover is dominantly dark blue and combined with yellow. Elements obtained from the web.

2) Preparation of Interactive Flipbook framework

The framework consists of basic parts, namely the introduction, activities, assessment, and bibliography. The basic part includes components such as title, preface, instructions for use, table of contents guide, learning outcomes, learning objectives, and learning flow. While the learning practice segment consists of materials, assignments, and quizzes.

c. Development

The Development stage has three stages including making Interactive Flipbooks, publishing, and validation of material experts and media experts. The results of the Interactive Flipbook development stage are as follows:

1) Making Interactive Flipbook

Interactive Flipbook is made using the Canva application for designing, typing material, and uploading quizzes and videos. The Interactive Flipbook paper size is A4. In Canva, there are features for adding quiz links, navigation, and videos that can be directly accessed through the Interactive Flipbook.

Results of Interactive Flipbook Learning Media Validation on Class XI Cell Material

Validation is a stage in development research that is used in assessing product designs, which are declared feasible before carrying out product trials (Fatimah & Muchtaridi, 2023). Product validation was carried out by two validators, namely material expert validators, namely Mrs. Anisatu Z. Wakhidah, S. Si, M. Si. And media expert validation Mrs. Asih Fitriana Dewi M.Pd who is a lecturer in the Biology Study Program. The results of product validation are as follows:

Material expert validation results

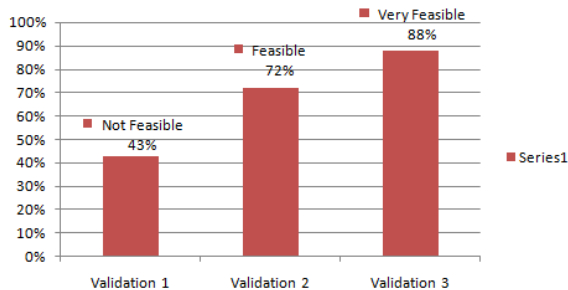


Figure 6. Material Expert Validation Results

As seen in Figure 6, it is known that the third validation results obtained the highest score of 88% with a very feasible category. So that the product is suitable for use without revision.

Media Expert Validation Results

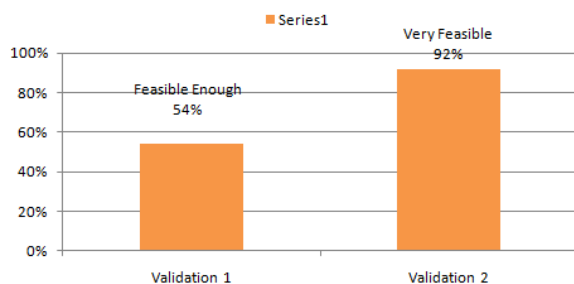


Figure 7. Media Expert Validation Results

Based on Figure 7, the second validation has increased to 92% with the criteria “very feasible”. So that the product can be tested in the field without any revision.

Results of Teacher and Learner Response

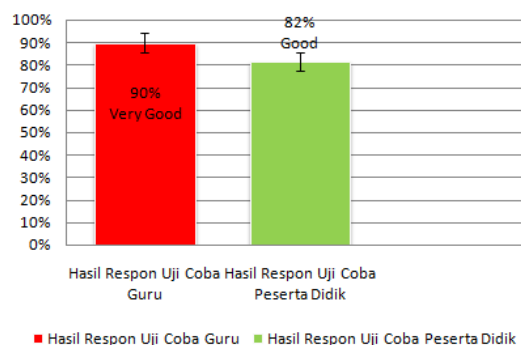


Figure 8. Results of teacher and learner responses

Based on Figure 8, the results of teacher respondents got a percentage of 90% in the “very good” category. Meanwhile, student respondents got a level of 82% in the “good” criteria. Based on responses from student and educator questionnaires, interactive flipbook learning media on cell material is declared “very good”. In general, all assessment results can be seen in Figure 9:

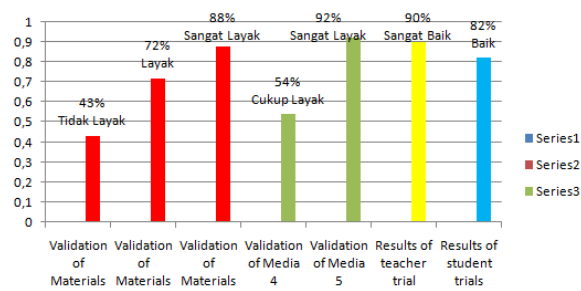


Figure 9. Overall Result of Assessment

Discussion

Based on the research that has been done, biology teachers have a sufficient understanding of cell material. But have difficulty in delivering cell material because it has a lot of material. For this reason, interactive flipbooks are needed to support the learning process.

Interactive flipbooks are a form of digital learning media that can be accessed by students in the form of information arranged in an attractive format. Therefore, there is a combination of images, text, and interactive elements such as animation or simulation so that it can provide a dynamic and in-depth learning experience (Masithoh, 2022). The advantage of this learning media is that it can simply present material,

provide many interactive quizzes and facilitate understanding of the material through videos that contain concise explanations of each topic taught. Meanwhile, the weakness of this media can only be used individually and requires adequate signal to be accessed (Mahya, 2023). In the context of cell material, biology teachers can use this media to present learning about cell concepts that can attract attention and be able to motivate students in learning.

Based on research, interactive flipbooks that function as learning media have proven their effectiveness in increasing interest and motivation to learn and improving students' cognition. In addition, learning activities and results can be emphasized and can help the learning process independently for students. Thus, the use of interactive flipbooks can create a more diverse and interesting learning experience. In addition, students can be actively involved in understanding cell material (Kartikasari et al., 2023); (Ayu Made Mia Arisandhi et al., 2023); (Rahayu et al., 2021).

In this development, the novelty that researchers offer is in the form of presenting interactive flipbooks that show a lot of learning videos in each discussion. Because in cell material there is material on membrane transport and cell division which must explain the mechanism of the process. The use of videos in learning media can help students understand cell material because the audio-visual element can make it easier for students to understand learning in the form of visualization (Dewi Sabdo Sih, 2019).

4. CONCLUSION

This research has produced a product, namely interactive flipbook learning media for cell material for class XI students of SMA N 1 Kotagajah by utilizing flipping books. Based on the results that have been evaluated in the previous section, it is known that the assessment results from material experts are 88% and categorized as very feasible, while the validation of media experts obtained a score of 92%. and in the category of very feasible. This is supported by responses from teachers and students. Educators' responses scored 90% on the excellent criteria, while students scored 82% with good criteria. Thus, it can be said that the medium is declared feasible for use in the learning process.

5. ACKNOWLEDGEMENTS

The researcher would like to thank those who have helped and collaborated in the preparation of this article. especially Mrs. Hifni Septina Carolina, M.Pd as the supervisor.

6. REFERENCES

- Arisoy, B., & Aybek, B. (2021). The effects of subject-based critical thinking education in mathematics on students' critical thinking skills and virtues*. *Eurasian Journal of Educational Research*, 2021(92), 99–120. <https://doi.org/10.14689/ejer.2021.92.6>
- Ayu Made Mia Arisandhi, G., Made Citra Wibawa, I., & Yudiana, K. (2023). *Flipbook: Media Pembelajaran Interaktif Untuk Meningkatkan Kognitif IPA Siswa Sekolah Dasar*. 11(1), 165–174. <https://doi.org/10.23887/jjpsd.v11i1.55034>
- Batubara, H. H., & Batubara, D. S. (2020). Penggunaan video tutorial untuk mendukung pembelajaran daring di masa pandemi virus corona. Muallimuna: Jurnal Madrasah Ibtidaiyah, 5 (2), 74–84. *Jurnal Al Ibtida*, 29, 74–84.
- Dewi Sabdo Sih, N. (2019). *Pensa E-Jurnal : Pendidikan Sains Penggunaan Media Video Pembelajaran Untuk Meningkatkan Hasil Belajar Sub Materi Metabolisme Sel*. 7(3), 350–354. <https://jurnalmahasiswa.unesa.ac.id/index.php/pensa/index>
- Dini Sari, E., Syamswisna, & Ariyati, E. (2017). Pembuatan Flipbook Keanekaragaman Hayati Sebagai Media Pembelajaran Kelas X Sma. *Jurnal Pendidikan Dan Pembelajaran Khatulistiwa*, 6(8), 1–8.
- Fatimah, A. N., & Muchtaridi, M. (2023). Artikel Review : Perencanaan Pola Pengambilan Sampel Produk Antara pada Validasi Proses. *Journal of Pharmaceutical and Sciences*, 6(1), 292–300. <https://doi.org/10.36490/journal-jps.com.v6i1.66>
- Fau, A., & Harefa, D. (2022). Budidaya Bibit Tanaman Rosela (Hibiscus Sabdariffa) Dengan Menggunakan Pupuk Organik Gebagro 77. *TUNAS: Jurnal Pendidikan Biologi*, 3(2), 10–18. <https://jurnal.uniraya.ac.id/index.php/Tunas/>

- article/view/545
- Gee, E., & Harefa, D. (2021). Analysis of Students' Mathematic Analisis Kemampuan Koneksi dan Pemahaman Konsep Matematis Siswa. *Musamus Journal of Primary Education*, 4(1). <https://doi.org/10.35724/musjpe.v4i1.3475>
- Harefa, D., Telaumbanua, T., Ge'e, E., Ndruru, K., Hulu, F., Dian Marsa Ndraha, L., Ndruru, M., & Sarumaha, M. (2020). Pelatihan Menendang Bola Dengan Konsep Gerak Parabola. *KOMNAS: Jurnal Pengabdian Kepada Masyarakat Universitas Pamulang*, 1(3), 75–82.
- Juliani, R., & Ibrahim, N. (2023). Pengaruh Media Flipbook Terhadap Hasil Belajar Bahasa Indonesia Siswa Kelas IV Di Sekolah Dasar. *ELSE (Elementary School Education Journal)*, 7(1), 20–26. <http://dx.doi.org/10.3065>
- Kartikasari, R. D., Sumardi, A., Cahya Kartika, P., & Tanti, S. (2023). Pengembangan Media Pembelajaran Flipbook Mata Kuliah Bahasa Indonesia untuk Perguruan Tinggi. *Prosiding Seminar Nasional Penelitian LPPM UMJ*, 3, 1–6. <http://jurnal.umj.ac.id/index.php/semnaslit>
- Lestari, W. M., & Salsabila, A. (2023). Pengembangan Media Pembelajaran Interaktif Puzzle Digital Materi Lingkaran Kelas VI SD Negeri Bluru Kidul 2 Sidoarjo. *Nusantara Educational Review*, 1(1), 7–14. <https://doi.org/10.55732/ner.v1i1.995>
- Mahya, N. Z. (2023). *Pengembangan Digital Flipbook Untuk Meningkatkan Pemahaman Konsep Materi Gaya Dan Gerak Bagi Siswa Kelas Iv Mi Miftahul Ulum Banjarsari*. 1–112.
- Masithoh, A. (2022). Pengaruh Model Pembelajaran Jigsaw Menggunakan Media Flipbook Terhadap Hasil Belajar IPS Kelas V SD. *Jurnal BELAINDIKA (Pembelajaran Dan Inovasi Pendidikan)*, 4(1), 21–27. <https://doi.org/10.52005/belaindika.v4i1.80>
- Maydiantoro, A. (2019). Model-Model Penelitian Pengembangan (Research and Development). *Jurnal Metode Penelitian*, 10, 1–8. [http://repository.lppm.unila.ac.id/34333/1/Model-Model Penelitian dan Pengembangan.pdf](http://repository.lppm.unila.ac.id/34333/1/Model-Model%20Penelitian%20dan%20Pengembangan.pdf)
- Mursidi, A. P., Prananto, I. W., Arifani, F., & Setyawati, R. (2022). Pengembangan Flipbook Interaktif untuk siswa kelas 5 sekolah dasar pada materi siklus air. *Jurnal Ilmiah Pendidikan Dasar*, 9(2), 128. <https://doi.org/10.30659/pendas.9.2.128-141>
- Novelza, I. D., & Handican, R. (2023). Systematic Literature Review: Apakah Media Pembelajaran Mampu Mempengaruhi Hasil Belajar Matematika? *Griya Journal of Mathematics Education and Application*, 3(1), 11–22. <https://doi.org/10.29303/griya.v3i1.269>
- Nur Aini, R., Gusfarenie, D., & Murtadlo, A. (2022). Media Pembelajaran Flipbook dan Pengaruhnya Terhadap Keaktifan Belajar Siswa. *EDU-BIO: Jurnal Pendidikan Biologi*, 5(2). <https://doi.org/10.30631/edubio.v6i1.34>
- Rahayu, D., Pramadi, R. A., Maspupah, M., & Agustina, T. W. (2021). Penerapan Media Pembelajaran Flipbook Interaktif untuk Meningkatkan Hasil Belajar Siswa. *Indonesian Journal of Mathematics and Natural Science Education*, 2(2), 105–114. <https://doi.org/10.35719/mass.v2i2.66>
- Sari, W. N., & Ahmad, M. (2021). Pengembangan Media Pembelajaran Flipbook Digital di Sekolah Dasar. *Edukatif: Jurnal Ilmu Pendidikan*, 3(5), 2819–2826. <https://edukatif.org/index.php/edukatif/article/view/1012>
- Ulandari, R., Syawaluddin, A., & Hartoto. (2022). Pengembangan Bahan Ajar Flipbook Berbasis Teknologi Informasi Dan Komunikasi (TIK) pada Siswa Sekolah Dasar di Kabupaten Jeneponto. *Pinisi Journal of Education*, 2(5), 106–114.
- Wijayanti, R. N., & Isnawati. (2023). Pengembangan Media Pembelajaran Berbasis Flipbook Interaktif pada Materi Sistem Saraf Manusia untuk Meningkatkan Motivasi Belajar Siswa Kelas XI SMA. *BioEdu: Berkala Ilmiah Pendidikan Biologi*, 12(2), 298–310. <https://ejournal.unesa.ac.id/index.php/bioedu/article/view/46557>
- Wulandari, A. P., Salsabila, A. A., Cahyani, K., Nurazizah, T. S., & Ulfiah, Z. (2023).

Pentingnya Media Pembelajaran dalam Proses Belajar Mengajar. *Journal on Education*, 5(2), 3928–3936. <https://doi.org/10.31004/joe.v5i2.1074>

Yulianto, D. (2022). Pengembangan Media Pembelajaran Flipbook Interaktif dalam PMRI Berbasis Youtube untuk Meningkatkan Daya Tarik Terhadap Siswa. *Symmetry: Pasundan Journal of Research in Mathematics Learning and Education*, 7(2), 193–209. <https://doi.org/10.23969/symmetry.v7i2.6630>