Development of Android-based Electronic Flipbook (E-Book) with Augmented Reality Technology in Green Business Courses

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Abstract: This research aimed to develop an interactive Android e-book using Augmented Reality (AR) to enhance student learning outcomes of Green Business courses. The e-book included both offline and online resources and utilized AR to provide 3D visuals for a more engaging learning experience. The method used was Research and Development (R&D) with the Plomp Model. This model consists of five stages namely Preliminary Investigation ; Design ; Realization / Construction ; Test, Evaluation and Revision ; and Implementation. The data analysis technique is an Effectiveness Test using SmartPLS4 software. The results showed that the Green Business e-book effectively improved students' learning outcomes. This research indicates that visually-based e-books can be an effective tool for enhancing student learning outcomes. Educational institutions should consider developing more digital learning materials, especially those related to topics such as Green Business.

Introduction

Technology, information, and communication are essential components of modern life. The availability of instructional resources, such as books, is one of the fundamentals of education. As a result of technological advancements, textbooks are now accessible online as e-books. The existence of e-books makes the learning process more effective and efficient (S. Y. Sari et al., 2022). E-books can be carried anywhere and accessed anytime, anywhere. This is very suitable for millennials who love using smartphones. Today's children, both students and university students, are more likely to search for information from smartphones rather than printed books or newspapers, take notes on smartphones, and rarely use notebooks (Larhmaid, 2018), (Inggriyani et al., 2019). They even do their assignments using smartphones instead of computers or laptops.

This research found that there aren't enough textbooks for the courses offered, especially for the Green Business course. This course teaches students about starting a business that is also good for the environment. It's a practical course because students learn how to make money while protecting the environment. However, there are no specific textbooks available for this course. Green Business books are hard to find. In addition to the lack of Green Business textbooks, there's also a shortage of digital resources like e-books for students to visualize the concepts. Lecturers usually use PowerPoint presentations, YouTube videos, and journal articles. However, unstable internet connections make it difficult to play YouTube videos directly in class. Lecturers often have to download videos beforehand and use a speaker, which isn't very convenient. One topic, renewable energy, is particularly interesting but students find it hard to fully understand when learning is solely based on PowerPoint presentations. Without visual aids, students struggle to imagine abstract concepts

like solar and wind energy. They need more visual teaching methods to improve their learning.

A book publication made available in electronic format that includes text, images, or both is called an e-book (Electronic Book) (Humairah, 2022), (Ambarita, 2021). An e-book can also be defined as a digital file containing text and images that are distributed electronically and can be read using a special device screen. E-books are easier to use because they can be accessed anytime and anywhere (Novitasari et al., 2019). With the existence of e-books, it will be easier for users because they can be downloaded and saved on their respective smartphones. Nowadays, e-books come with various technological features. If previously e-books were only electronic versions of printed books, with the massive development of technology, e-books come with various advanced features (Zahara et al., 2017).

To solve these problems, a digital textbook (e-book) that can include videos, articles, and scientific papers is needed. Students can even take quizzes directly in the e-book. This kind of e-book is called a Flipbook. Flipbooks are electronic books that can display sound, video, and animated images, making the book more visual and providing a more realistic reading experience. A Flipbook is an electronic format media that combines animation, text, video, images, audio, and navigation making learners more interactive and learning more interesting (Widyasari et al., 2021), (Setiadi et al., 2021). This text can make complex learning concepts tangible, making them more real and easier for students to understand, which is very different from general e-books that only contain text and image content (Tuazmi, 2022). It's like a digital book that has interactive elements. Augmented Reality (AR) can be used to add 3D images to the e-book, creating an even more engaging learning experience. A technology called augmented reality (AR) can blend two or three-dimensional virtual objects with the actual environment in real time (Aditama et al., 2019), (Batubara & Sinaga, 2023). AR technology can combine real-world images with computer-generated images. Combining Flipbooks and Augmented Reality can create a more interactive and effective learning tool for Green Business courses. This e-book will be designed for Android devices so students can use it on their smartphones.

The development of an Android-based e-book has been conducted by several researchers (Pardede & Sitorus, 2021), (Nurmala et al., 2019), (Lufthansa et al., 2020). The research results indicated a 100% increase in student achievement. The produced e-book was also effective in improving students' motivation and learning outcomes. (Wicaksono et al., 2021), (Pradani & Aziza, 2019) and (Ilham et al., 2023) conducted a study about Flipbook maker-based electronic teaching materials development. The results indicated that the developed e-book-based Flipbook materials exhibited validity and were deemed suitable for use. Moreover, the effectiveness test revealed that the materials were able to enhance students' learning outcomes.

This study was implemented at the Entrepreneurship Study Program, Universitas Negeri Medan. This research needs to create a new textbook for this course to help lecturers teach their students. The research aims to produce an Android-based Electronic Flipbook (e-book) with Augmented Reality technology for the Green Business course that can significantly enhance students' learning outcomes. It is anticipated that the developed e-book will facilitate students in gaining a deeper understanding of the course material by providing more realistic explanations. Additionally, it is anticipated that this research will help the Entrepreneurship Study Program optimize its learning process.

Research Method

The Plomp Model was used in this study's Research and Development (R&D) design. The five stages of the Plomp Model are as follows: (1) Preliminary Investigation, (2) Design, (3) Construction and Realization, (4) Test, Evaluation, and Revision, and (5) Implementation. (Nieveen & Folmer, 2013). Plomp Model was selected because, compared to other models, it was considered more flexible, adaptable, and practical, as each phase involves development activities that can be tailored to the specific needs of book development.
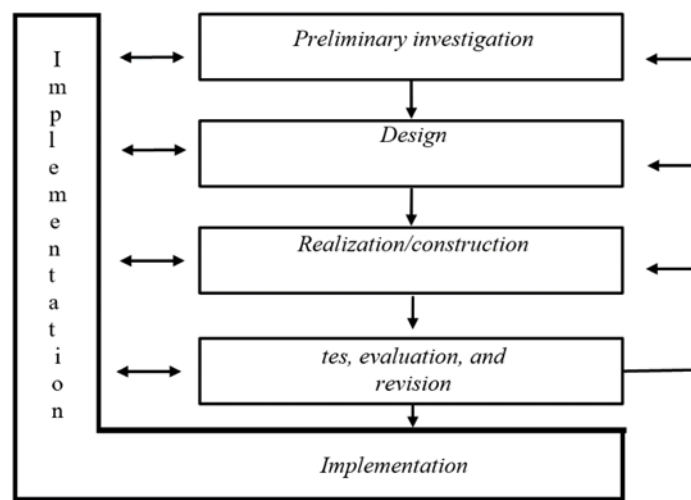

Figure 1. Plomp Model

The Plomp research model's phases can be further explained as follows:

1) Initial Phase of Investigation

This phase, which entails detecting issues in the field, is often referred to as situational analysis

 a) Needs Analysis: To identify the specific requirements for effective learning in the Green Business course, a needs analysis was carried out (R. K. Sari, 2019), (Hendriyani et al., 2018). This analysis involved conducting interviews with both instructors and students of the course.

 b) Learning Obstacle Analysis: Learning obstacles refer to the challenges encountered by learners during the learning process. The initial stage of this investigation aims to identify these obstacles and subsequently develop solutions to address them.

2) Design Phase

 a) Content Development

 The initial step involved designing the structure of the Green Business e-book. This included developing a detailed course syllabus and carefully selecting relevant topics, learning videos, research papers, and other supplementary materials.

 b) Technological Implementation.

 To create an interactive learning experience, a 3D Pageflip software was chosen to develop a Flipbook format. Additionally, Asemblr Aps was selected to integrate augmented reality features, while CorelDRAW and Android Studio were used to develop the Android-based e-book.

a) User Interface Design:

The user interface was designed to provide a seamless and intuitive user experience. The initial menu, displayed after the loading process, serves as the welcome screen. By clicking

the menu button on this initial screen, The main menu is shown to users. There are four main options on the main menu: evaluation, learning objectives, learning materials, and about.

3)   Phase of Realization and Construction

At this point, the design phase results in the creation of the first prototype. Every design created throughout the design phase will be implemented.

4)   Phase of Testing, Evaluation, and Revision

At this point, an effectiveness test was being carried out. To ascertain whether the produced e-book is useful for learning, an effectiveness test was carried out (Susanto et al., 2023). Effectiveness can be defined as the outcome resulting from an action, in this case, the impact of using the Green Business e-book on learning outcomes (Sutrisno et al., 2018). An effectiveness test is conducted as a measure of the success level of a learning process (Laili, 2019). A book can be considered effective if it improves the learning outcomes of the pupils.

5)   Implementation Phase

The final step in this process involves the distribution of the book to students.

This study involved 40 fourth-semester Entrepreneurship students enrolled in the Green Business course during the even semester of 2023/2024, selected from a total population of 80 students. To test the effectiveness of the newly developed Green Business e-book in improving students' learning outcomes, the research sample will be subjected to a paired samples t-test in a before-and-after experimental design. This before-after experimental design aims to examine whether the newly developed Green Business e-book is effective in enhancing students' learning achievements. The hypothesis for this study is:

Ho: There is no increase in learning outcomes before and after using the Green Business e-book.

Ha: There is an increase in learning outcomes before and after using the Green Business e-book.

If the significance value (Sig) is more than 0.05, the null hypothesis (Ho) will be accepted; if it is less than 0.05, it will be rejected (Danardono et al., 2019), (Sutrisno et al., 2018).

Results and Discussion

The following is a description of the research's findings:

1)   Preliminary Investigation Phase

This phase, also known as situational analysis, involves identifying problems in the field:

  a) Needs Analysis

Needs analysis is a systematic process used to identify and evaluate needs or gaps between the current and desired conditions in a context, such as education, business, or a project (M. W. Sari, 2019). To identify the specific needs of students and instructors in the Green Business course, a needs analysis was conducted through interviews. The analysis revealed a need for a comprehensive learning guide that includes clear assignments, a digital format accessible on smartphones, and supplementary materials like videos, case studies, and journal articles. Additionally, the integration of 3D images was suggested to enhance the learning experience. These findings were used to guide the development of the Green Business book.

  b) Learning Obstacle Analysis

Learning obstacles can be defined as barriers experienced in the learning process (Çelik & Kocaman, 2016). According to the findings of the interviews, some of the challenges that students encountered were: (1) Students struggled to grasp fundamental Green Business concepts, including the distinction between genuine sustainability practices and greenwashing ; (2) Due to a lack of familiarity with

sustainability indicators and relevant data, students encountered difficulties in analyzing real-world case studies of companies implementing Green Business strategies ; (3) Students often lacked confidence in their ability to develop practical Green Business strategies that could be applied to their specific industries ; (4) Limited environmental knowledge hindered some students' understanding of the urgent need for Green Business ; (5) Some students exhibited a lack of interest in Green Business, perceiving it as an abstract concept or irrelevant to their future careers. The results of the interviews were used as information in the development of the book.

2) Design Phase

At this stage, the content of the book was designed. At this stage, the content of the book consisting of 10 chapters was compiled.

3) Realization / Construction Phase

The realization/construction stage of this book involves the realization of an Android-based Electronic Flipbook (E-book) with Augmented Reality technology. In this stage, several steps are carried out, including:

a) Layout Process.

The book layout process is a series of steps taken to arrange and organize text, images, graphics, and other elements in a book to prepare it for printing or digital publication. This process ensures that the content of the book is presented in an attractive, readable, and consistent manner.

b) Process of Inserting the Book into a Flipbook

Once the book layout is finalized, the next step involves converting it into a Flipbook format using Flip PDF Professional. This process includes creating a new project, importing the PDF file of the book, and customizing the user interface and user experience for the target device. When creating digital products like websites, applications, and software, the design ideas of user interface (UI) and user experience (UX) are essential. The visual components that users interact with, like buttons, menus, icons, and color schemes, are referred to as user interfaces (UI). Conversely, user experience (UX) refers to the whole of the user's interaction with the product.
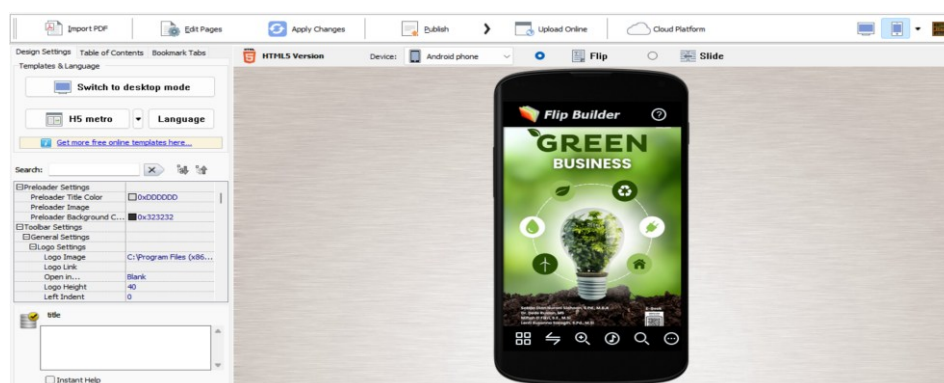

Figure 2. UI/UX Adjustments

UX includes the feelings, emotions, and responses of users to such interactions, which are influenced by how easy, pleasant, and effective the interface is in helping users achieve their goals. One of the UX in this e-book is the presence of a background sound of nature so that readers can feel carried away by the green nature atmosphere when reading it. Once the book's layout was finalized, the next step involved converting it into a Flipbook format. This was achieved through the use of Flip Pdf Professional, where a new project is initiated and

the completed Pdf book file is imported. The user experience (UX) and user interface (UI) were then tailored to the target device. The subsequent phase entails editing the book's pages to incorporate videos, access links, and other necessary modifications. Once these adjustments are complete, the e-book file is exported in HTML format. HTML serves as the programming language responsible for structuring web pages. Exporting the file to HTML signifies the completion of the basic Flipbook. The next stage involved integrating augmented reality (AR) features using the Assembler App. AR enables the book to display interactive three-dimensional content when viewed through AR-supported devices, such as smartphones.

   c) Process of Inserting and Editing in Assembler App
(1) Open Assembler Studio, and create a new project
(2) Add Desired 3D Objects
(3) Adjust the Position and Size of Each Object to Form the Desired Atmosphere
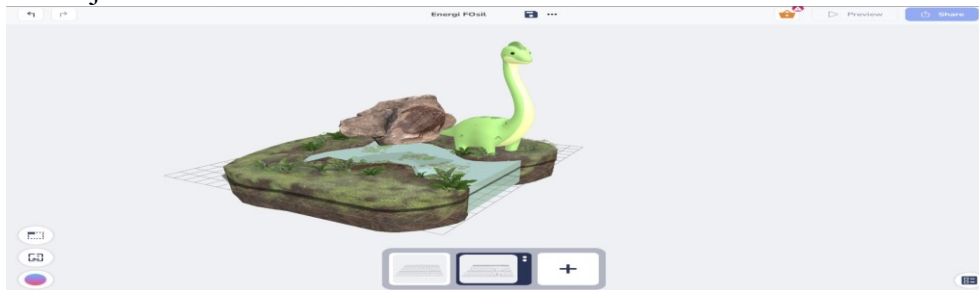(4) Publish Project

Figure 3. Generated 3D Images

   d) Inserting the E-book into the Application
After the E-book is in HTML format, it can be converted into an APK (Application) using the Website 2 APK Builder. The steps involved are:
(1)   Filling in APK Requirements According to Needs. This step involves filling in detailed application information such as the application name, application icon, and other settings. The application name is Green Business.
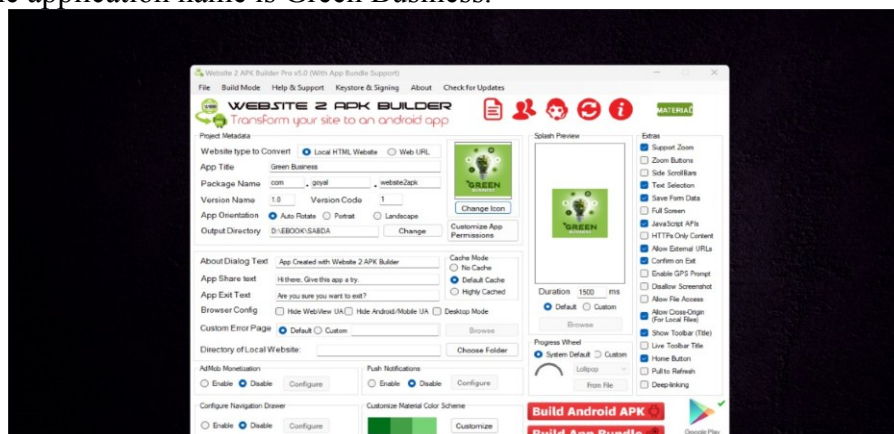

Figure 4. Configuring the APK according to the required specifications

(2)   Build APK. After filling in the application requirements, the next step is to build/compile the e-book application.
(3)   Transferring and Installing the Application to Android. Once completed, transfer it to Android, install it, and it can be used.
After installation, the appearance of the application on the Android smartphone can be seen in the following image:

Figure 5. Android Augmented Reality Flipbook Application Display

e)   Test, Evaluation, and Revision Phase

Prior to and during their use of the study product, students' learning results were evaluated. Prior to the therapy, a pretest was given, and then the Green Business e-book was used to provide the course information. The difference in the learning results of the pupils was then assessed using a posttest. The effectiveness of the intervention was assessed using the paired samples t-test. The mean pretest score was 76.1667, and the mean posttest score was 87.7143, according to the paired samples t-test results shown in the above table. The average learning outcomes between the pre-test and post-test differ descriptively because the posttest mean is higher than the pretest mean. To determine whether this difference is statistically significant, we refer to the Paired Samples Correlations. According to the data, this study's correlation coefficient was 0.333 at a significance level below 0.031. There is a high and significant correlation between the pretest and posttest scores, as indicated by the significance level of 0.031 being less than 0.005.

The hypothesis of this study was as follows:

H_0 : There is no improvement in learning outcomes before and after using the Green Business e-book.

H_a: There is an improvement in learning outcomes before and after using the Green Business e-book.

According to (Danardono et al., 2019), (Taufik et al., 2021) , if the significance value (Sig) is less than 0.05, H_0 is rejected; if it is larger than 0.05, H_0 is approved.

The obtained Sig value is 0.000, which is less than 0.05, according to the data analysis results shown in the above table. As a result, H_a is approved while H_0 is disapproved. To put it another way, it has been demonstrated that the Green Business e-book improves students' learning results in the course.

f)   Implementation

The implementation stage aims to apply the developed and revised book in a broader learning context. Activities included distributing and using the book in a wider learning environment. Additionally, monitoring and observing the implementation of the book to ensure its use is in line with the expected objectives. The developed Green Business e-book has been distributed to students and is ready to be used in studying.

Discussion

The result of the Green Business book compilation is materialized in both print and e-book formats. The book has been registered with an International Standard Book Number (ISBN). The title page, book caption, preface, table of contents, and list of diagrams and tables make up the opening portion of the overall material. Book chapters make up the majority of the text. Learning objectives, content explanations, assignments, and a bibliography are all included in each chapter. The author's biography is included in the book's conclusion. The title is prominently displayed on the front cover, with a design and image that reflect the overall content. The book consists of 10 chapters. Most importantly, the book is presented in a Flipbook format with Augmented Reality (3D) technology, and can be used on Android devices.

The matched Samples T-test, which seeks to ascertain whether there is a significant variation in the mean between two matched samples, was used to assess the book's efficacy. The mean difference between the student's pre-test and post-test scores was 11.54, according to the findings of the Paired Samples T-test. This suggests that there was a significant difference between the pre-test and post-test results. The Paired Samples T-test yielded a significance level of 0.00, which is below 0.05. As a result, it can be said that the Green Business e-book improved students' learning results. Similar results were documented in earlier research by (Farida & Ratnawuri, 2021), (Ardiansyah & Ridwan, 2023), and (Pardede & Sitorus, 2021), which demonstrated the effectiveness of Android-based electronic Flipbooks in enhancing learning outcomes.

The implications of this study include several important points. Augmented Reality technology revolutionizes traditional learning by offering interactive and immersive experiences. Students can visualize abstract concepts, engage with 3D models, and simulate real-world scenarios, making learning more engaging and memorable. Android-based Electronic Flipbook (e-books) with Augmented Reality significantly increase student engagement and motivation, leading to higher levels of learning outcomes. Educational institutions should consider developing more digital learning materials, especially those related to topics such as Green Business.

Conclusion

Based on the findings and data obtained in this research, it can be concluded that; First, the Plomp Model, which had five stages, was used to create an Android-based electronic Flipbook using augmented reality technology for students studying entrepreneurship. These stages are preliminary investigation, design, realization/construction, test, assessment and revision, and implementation. The book comprises 10 chapters covering fundamental concepts of green business, fossil fuels, global warming, renewable energy, green production, waste management, green pricing, green supply chain management, green offices, and green certifications and Corporate Social Responsibility. The book consists of 175 pages.

Second, the research product, an Electronic Flipbook with Augmented Reality has been approved for educational usage. It is based on Android. Third, it has also been discovered that the product is useful for educational purposes. Fourth, the most significant finding is that the product has proven to be effective in enhancing student learning outcomes. The e-book has successfully demonstrated its ability to improve students' understanding of green business concepts and principles.

Recommendation

Based on the findings that the Android-based Electronic Flipbook with Augmented Reality (AR) has effectively improved student learning outcomes in Green Business courses, several recommendations are proposed for both instructors and students. For instructors, it is recommended to integrate the Android-based AR Flipbook as a key learning resource within the curriculum, using its interactive features to make complex concepts more accessible and engaging. In class, the use of AR content can enhance learning experiences, particularly during discussions on green technology and sustainable practices. Additionally, encouraging students to use the Flipbook outside of class for self-paced study can further reinforce their understanding. Instructors are advised to gather feedback from students regularly to identify areas for improvement and to provide brief training on AR functionality to ensure students can navigate the app effectively.

For students, it is beneficial to fully engage with the AR features within the Flipbook to deepen their understanding of green business concepts. Revisiting topics through interactive 3D models and animations as part of a study routine can significantly aid knowledge retention. Providing constructive feedback on the Flipbook's usability and content will help improve its effectiveness for future use. Moreover, students are encouraged to utilize AR content collaboratively in group discussions or projects, fostering a richer understanding of sustainability topics by exploring different perspectives. Following these recommendations will allow both instructors and students to maximize the benefits of the Android-based Electronic Flipbook with AR, enhancing the overall learning experience in Green Business courses.

Acknowledgment

References

Aditama, P. W., Adnyana, I. N. W., & Ariningsih, K. A. (2019). Augmented Reality Dalam Multimedia Pembelajaran. *SENADA (Seminar Nasional Manajemen, Desain Dan Aplikasi Bisnis Teknologi)*, *2*, 176–182.

Ambarita, J. (2021). Workshop Pembuatan E-book Sebagai Bahan Ajar Elektronik Interaktif Untuk Guru Indonesia Secara Online di Tengah Covid 19. *Community Engagement and Emergence Journal (CEEJ)*, *2*(1), 44–57.

Ardiansyah, A. D., & Ridwan, M. (2023). Penerapan E-modul Berbasis Flipbook Terhadap Hasil Belajar Passing Permainan Sepak Bola Di SMKN 2 Buduran. *SPRINTER: Jurnal Ilmu Olahraga*, *4*(2), 169–174.

Batubara, A. A., & Sinaga, I. A. (2023). Penerapan Teknologi Augmented Reality Untuk Rangkuman Isi Buku Pada Perpustakaan Fakultas Berbasis Android. *KLIK: Kajian Ilmiah Informatika Dan Komputer*, *4*(2), 995–1001.

Çelik, Ö., & Kocaman, O. (2016). Barriers Experienced by Middle School Students in the Process of Learning English. *International Journal of Psychology and Educational Studies*, *3*(1), 31–46.

Danardono, A., Rudibyani, R. B., & Sofya, E. (2019). Efektivitas Media E-Book untuk Meningkatkan Metakognisi dan Penguasaan Konsep Siswa. *Jurnal Pendidikan Dan Pembelajaran Kimia*, *8*(3), 495–508.

Farida, N., & Ratnawuri, T. (2021). Analisis Kebutuhan Pengembangan e-Modul Berbantu Flipbook Pada Mata Kuliah Statistik. *Jurnal Lentera Pendidikan Pusat Penelitian Lppm Um Metro*, *6*(2), 191–195.

Hendriyani, Y., Delianti, V. I., & Mursyida, L. (2018). Analisis Kebutuhan Pengembangan Media Pembelajaran Berbasis Video Tutorial. *Jurnal Teknologi Informasi Dan Pendidikan*, *11*(2), 85–88.

Humairah, E. (2022). Penggunaan Buku Ajar Elektronik (E-Book) Berbasis Flipbook Guna Mendukung Pembelajaran Daring Di Era Digital. *Prosiding Amal Insani Foundation*, *1*, 66–71.

Ilham, A., Hidayat, J. T., Amri, M. F. L., Isnanto, J., & Haryanto, A. I. (2023). Pengembangan Buku Saku Perwasitan Tenis Meja Berbasis Flipbook. *Journal on Education*, *5*(4), 13000–13008.

Inggriyani, F., Hamdani, A. R., & Dahlan, T. (2019). Minat Belajar Mahasiswa dengan Menggunakan Blended Learning melalui Google Classroom pada Pembelajaran Konsep Dasar Bahasa Indonesia SD. *Jurnal Ilmu Pendidikan, Keguruan, Dan Pembelajaran*, *3*(1), 29.

Laili, I. (2019). Efektivitas Pengembangan E-Modul Project Based Learning Pada Mata Pelajaran Instalasi Motor Listrik. *Jurnal Imiah Pendidikan Dan Pembelajaran*, *3*(3), 306–315.

Larhmaid, M. (2018). The Impact of Print vs. Digital Resources on Moroccan University Students' Reading Habits, Uses, and Preferences. *SHS Web of Conferences*, *52*, 2001.

Lufthansa, L., Saputro, Y. D., & Kurniawan, R. (2020). Pengembangan Buku Ajar Psikologi Olahraga Berbasis Android Untuk Meningkatkan Motivasi Belajar dan Kemampuan Berpikir Kritis Mahasiswa. *Jurnal Pendidikan Jasmani Indonesia*, *16*(2), 214–223.

Nieveen, N., & Folmer, E. (2013). Formative Evaluation in Educational Design Research. *Design Research*, *153*(1), 152–169.

Novitasari, D., Ratnawuri, T., & Pritandhari, M. (2019). Pengembangan Media Pembelajaran Elecronic Book (E-Book) Berbasis Edmodo Kelas X SMK Kartikatama Metro. *Jurnal Promosi Program Studi Pendidikan Ekonomi*, *7*(2).

Nurmala, R., Izzatin, M., & Mucti, A. (2019). Desain Pengembangan Buku Saku Digital Matematika SMP Berbasis Android Sebagai Media Pembelajaran Dalam Meningkatkan Minat Belajar Siswa. *Edukasia: Jurnal Pendidikan*, *6*(2).

Pardede, H., & Sitorus, P. (2021). Pemanfaatan Interactive e-Book Berbasis Android Untuk Meningkatkan Hasil Belajar Mahasiswa. *Jurnal Suluh Pendidikan*, *9*(1), 18–23.

Pradani, Y. F., & Aziza, Y. (2019). Pengembangan Multimedia Pembelajaran Dalam Bentuk Buku Digital Interaktif Berbasis Flipbook Bagi Mahasiswa Teknik Mesin. *Jupiter (Jurnal Pendidikan Teknik Elektro)*, *4*(2), 1–10.

Sari, M. W. (2019). Analisis Strategi Pemasaran Dengan Menggunakan Metode Quantitative Strategic Planning Matrix (QSPM) Pada Usaha Kecil Menengah (UKM)(Studi Kasus pada Roman Indah Ukm di Padang). *Jurnal Ilmu Manajemen Terapan*, *1*(1), 86–96.

Sari, R. K. (2019). Analisis Kebutuhan Pembelajaran Bahasa Inggris pada Mahasiswa Kelas Karyawan. *SAP (Susunan Artikel Pendidikan)*, *4*(1).

Sari, S. Y., Rahim, F. R., Sundari, P. D., & Aulia, F. (2022). The Importance of E-books in Improving Students' Skills in Physics Learning in the 21st Century: A Literature Review. *Journal of Physics: Conference Series*, *2309*(1), 12061.

Setiadi, M. I., Muksar, M., & Suprianti, D. (2021). Penggunaan Media Pembelajaran Flipbook Untuk Meningkatkan Aktivitas Dan Hasil Belajar Siswa. *JISIP (Jurnal Ilmu Sosial Dan Pendidikan)*, *5*(4).

Susanto, H., Prawitasari, M., Akmal, H., Syurbakti, M. M., & Fathurrahman, F. (2023). Efektivitas Penggunaan Buku Ajar Mata Kuliah Media Pembelajaran Sejarah. *Jurnal PIPSI (Jurnal Pendidikan IPS Indonesia)*, *8*(1), 1–10.

Sutrisno, S., Prasetyowati, D., & Kartinah, K. (2018). Efektivitas Buku Ajar Matematika SMP Berbasis 3-D untuk Meningkatkan Kemampuan Komunikasi Matematis Siswa. *JURNAL SILOGISME: Kajian Ilmu Matematika Dan Pembelajarannya*, *3*(1), 8–13.

Taufik, T., Imansyah, M. N., & Yulianti, E. (2021). Efektivitas Penggunaan Buku Ajar Sastra Lisan Suku Mbojo Berorientasi Pada Model CIRC Untuk Matakuliah Apresiasi Sastra. *Jurnal Inovasi, Evaluasi Dan Pengembangan Pembelajaran (JIEPP)*, *1*(2), 41–45.

Tuazmi, N. (2022). *Pengembangan Bahan Ajar E-book Menggunakan 3D Pageflip Professional pada Mata Kuliah Pengembangan Bahan Ajar dan Buku Teks*. Universitas Negeri Padang.

Wicaksono, A., Supriyono, S., & Akhyar, F. (2021). Development of Electronic Teaching Materials Based Flip Book Makers for Language Skills in Elementary Schools. *Journal of Physics: Conference Series*, *1987*(1), 12008.

Widyasari, I., Zetriuslita, Z., Istikomah, E., & Herlina, S. (2021). Pengembangan Media Pembelajaran Berbasis Flipbook Pada Materi Sistem Persamaan Linear Dua Variabel di Kelas VIII SMP. *Jurnal Derivat*, *8*(1), 61–71.

Zahara, N., Djufri, D., & Sarong, M. A. (2017). Optimalisasi Pembelajaran Dengan E-Book dan Media Pembelajaran Berbasis Multimedia Untuk Meningkatkan Hasil Belajar Siswa Kelas X SMA Pada Materi Dunia Tumbuhan. *BIOTIK: Jurnal Ilmiah Biologi Teknologi Dan Kependidikan*, *2*(2), 105–109.