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Development Of Innovative AR-Based Teaching Media Using The Assemblr-Edu Platform On Asset Material

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Abstract* — This research aims to develop innovative learning media based on Augmented Reality (AR) using the Assemblr-Edu platform on asset material assisted with Canva media. This research uses the Research and Development (R&D) method with the 4D development model (Define, Design, Develop, and Disseminate). The research instrument is a questionnaire involving media experts, material experts, and student responses. The sample of research subjects consisted of five students of class XII SMK Veteran Cirebon. Based on the validation results, the developed media obtained a percentage of eligibility of 90% from media experts, 89% from material experts, and 95% from student responses. The results showed that the products produced were valid and able to increase students' interest in learning. Thus, this AR-based teaching media has the potential to be an innovative solution in learning accounting, especially in asset material.

Keywords — ***Augmented Reality (AR); Assmblr-Edu; Student Learning Interest; Assets***

I. INTRODUCTION

Education is knowledge and learning that takes place in various situations and contexts of life and has a positive impact on the development of each individual [1]. The use of learning media is very important in the educational process because it allows learning to be more effective and efficient and as a key in achieving learning goals [2]. Learning media are tools and techniques used to increase the effectiveness of communication and interaction between educators and students during the teaching and learning process at school [3].

In today's digital era, traditional learning methods are considered less effective in stimulating student interest. Therefore, educators must have creative and innovative ideas in creating and developing learning media that can attract students' attention. Along with the development of the times, learning media today can be synchronized with technology so that it can produce an innovative learning media [4]. Learning media created from a combination of technology expresses innovation by integrating various forms of media controlled through computers. This combination is considered as the most advanced method, especially supported by computers with outstanding functionality. Exploration of this type of media opens up new opportunities in creative and dynamic learning, providing challenges and opportunities for students to understand and master the material more interestingly and deeply [3].

Before the research was conducted, the authors first analyzed the potential problems in the research object, namely at SMK Veteran Cirebon. Based on the results of field observations, it was found that the learning used was still conventional by using books as the learning media. This is indicated by 80% of the sample saying that they rarely use technology during the learning process. With the presence of AR technology, students are interested in trying this media. Almost all samples said they did not know this AR technology, making it a special attraction for students. Researchers also noticed that the ram capacity of the cellphone owned by students was ready to use this Assemblr application with a range of ≥ 2GB.

Utilizing technology in the education sector to create effective learning media is needed. One of the technological developments in the education sector is the use of virtual technology, commonly referred to as AR. AR is a technology that combines two-dimensional or three-dimensional virtual objects into a three-dimensional real environment and displays

these virtual objects in real time (Muntahanah, Toyib, & Ansyori, 2017) in [5].

The use of AR technology as learning media can improve students' ability to think critically about problems and events in everyday life. The utilization of AR allows direct learning whenever and wherever students want to do the learning process [6]. AR learning media can help students visualize abstract learning concepts [7]. AR-based learning materials are not only proven to improve student understanding of subject matter, but also provide flexibility in learning time. Students can learn anywhere and anytime by using mobile devices that support Augmented Reality technology. The development of innovative learning media based on Augmented Reality opens up great opportunities to improve the quality of education. With the help of this technology, it is expected that the learning process will become more interesting and effective, and meet the needs of today's digital generation [5].

Assemblr EDU is a platform that makes learning sessions more interesting and interactive by using 3D and AR displays [8]. The Assemblr Edu application allows users to create and access interactive learning media based on Augmented Reality (AR) [9]. This platform displays animations in 3D and can be viewed anywhere using the available QR code. The Assemblr-Edu platform provides a variety of 3D animations that can be downloaded and used by users. Not only using objects that have been provided in the platform, users can also add other objects. This object addition can be in the form of 3D or 2D objects that are tailored to the user's wishes.

Chen et al in their research from 2011 - 2016 recorded 55 studies that discussed this platform [10]. In a period of 5 years, there have been many researchers who have discussed this theme, until now there are not a few researchers who discuss this theme. Even though there have been many researchers discussing Assemblr Edu, in the field conditions there are not a few people who are still awaiting this Assemblr Edu platform. Yudhistira, et al (2021) reported by tekno.sindonews.com in 2020 said that this media has not been widely applied and is more widely used as entertainment than learning media [11].

The Assemblr Edu platform is intended to display text and images in three dimensions through augmented reality with a very attractive initial appearance of the application and can be used to create learning media that includes graphic design as well as all fields of science such as biology, mathematics, chemistry, astronomy, language, etc. [12]. No exception in accounting subjects. In research conducted by Sholihah and Putri (2024) with the title "Development of Augmented Reality Learning Media Using Assemblr Education in Manufacturing Company Accounting Subjects" explained that in accounting learning can be done using the Assembler Education platform.

The research conducted by Sholihah and Putri attempted to develop teaching media by combining two platforms, namely Canva to get objects or other animations and Assemblr Education to display objects or animations in the form of Augmented Reality (AR) [9]. Ariansyah, et al (2024) conducted a study entitled "Development of ARCER (Augmented Reality Short Story) Learning Media Assisted by Assemblr Edu and Canva on Short Story Text Material for Class IX Students of State Junior High School 4 Tanjungpinang School Year 2023/2024", in wh[8]ich in the study Ariansyah, et al combined two platforms namely Canva and Assemblr Edu. From this study, the final results of validation by media experts were 98% with very valid qualifications, material experts were 80% with valid qualifications. So it can be concluded that the teaching media product is suitable for use [13].

With these two previous studies, the author is motivated to be able to make a product in the form of Assemblr teaching media and wants to know whether Assemblr teaching media is in accordance with the era of society 5.0 and is appropriate for use by students in asset material. Of course, in this study the authors relate to asset material in accounting subjects. The hope of researchers by raising this theme is that the learning process in class can be technology-based following the development of the current era of society and of course it is packaged with an attractive design and is easy for educators and students to understand and use.

II. METHOD

This research uses the RnD (Research and Development) method. Sari, et al (2023) said research and development is a research strategy that identifies needs in the field before making products that are tested [14]. The RnD model used is the Thiagarajan model or commonly called 4D. According to Sugiyono (2016) in [14], this model consists of 4 stages, namely define, design, development, and disseminate. The subjects of this study were XII grade students in vocational schools. The instrument used in this research is a learning activity observation sheet. The data collection methods used in this research are validation questionnaire method, and observation sheet. The data analysis technique used is quantitative data analysis, which is a research method that uses objects in the form of numerical data [15].

The first stage is that researchers analyzed the potential problems that occurred in the learning process at SMK in Cirebon, then collected data to create AR-based learning media on the Assemblr-Edu platform. The second stage is designing teaching media products according to the needs in the field. In the last stage, namely testing the validity of the product that has been designed and developed by expert validators to find out how valid the product is used. The final validation and field test results are calculated as follows.

$$P = \frac{\Sigma i}{\Sigma x i} \times 100\%$$

Table 1. Validity Test & Field Test Results Formula [16].

The scoring results will be a benchmark for product feasibility using parameter statistics.

PRESENTATION	QUALIFICATIONS	DESCRIPTION
80% – 100%	Worth	Good, no revision needed
60% – 79%	Decent Enough	Good, needs partial revisions
50% – 59%	Less Feasible	Not good, partial revision and reassessment of content or material
< 50%	Not Feasible	Not good, overall revision

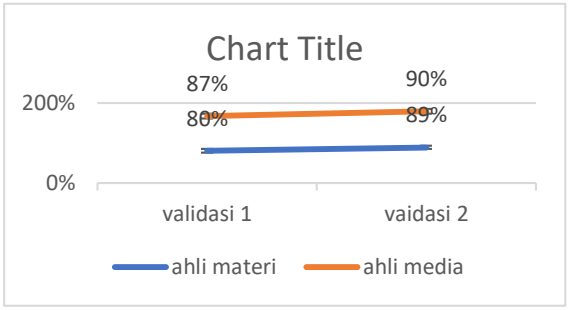
III. RESULTS AND DISCUSSION

This study aims to determine the accuracy of Assemblr-Edu learning media with asset material, determine students' readiness to use Assemblr-Edu learning media, and provide a stimulus for educators to connect technology-based learning. The results of this study indicate that the development of the Assemblr-Edu platform has successfully produced a product that meets the effectiveness criteria as an innovative learning media that can be used in the learning process. The method used to develop this product is 4D (Define, Design, Development and Disseminate). In this study due to time constraints so that researchers can only do it up to the development stage. The development process took place in several stages, starting from needs analysis to evaluation by experts. This research involved 2 validators and 5 respondents, namely material experts, media experts and students.

Media development in this study begins with the definition stage, namely conducting curriculum analysis to analyze student needs for the use of innovative learning media. The results of this stage become a reference to determine the objectives of learning media development. The next stage is the design stage, where visualizations and narratives are designed based on asset materials and colors, animations, and attractive graphic elements are identified based on the objectives and needs of students. After the design stage, the next stage is the development stage which focuses on the creation and validation of 3D animation through the stages of animation creation, expert validation, and product revision. The product can be seen in the following figure.

The development of the Assemblr-Edu platform as a learning media for assets material shows that the resulting product meets the quality and relevance standards as a more innovative learning. The Assemblr-Edu platform aims to explain asset concepts such as various types of assets through clear narratives and attractive visual representations. In the development stage, the product validation process is carried out. The goal is to obtain evaluation and suggestions for improvement of the developed product. The results of the material expert assessment in the first validation amounted to 80% with valid criteria for use. Material experts provide suggestions for improvement such as the background of the animation display which tends to be dark and the text listed is less clear to read. After receiving suggestions from the material expert and making repeated improvements in accordance with the instructions for improvement, it finally reached a validation result of 89%. In the first validation, the results of the media expert assessment have met the validation criteria of 87%. However, media experts provide suggestions for improvement of the products developed in the form of animations that are used still tend to be stiff and monotonous. After improvement, the assessment percentage was 90%.

The following are the results of the first and second stage validation conducted by two validators, namely material experts and media experts, as follows:



In addition to product validation by experts, the Assemblr-Edu platform was also tested on Class XII students who had received economic assets material. The results of the limited trial conducted on 5 vocational students on the Assemblr-Edu platform showed a positive response and significant participation in creating innovative learning. The trial aims to measure the effectiveness of the Assemblr-Edu platform in helping students understand the assets material and to find out students' responses to the quality of learning media. Learners stated that the use of dynamic and systematic animation elements made it easier for them to understand the assets material. In addition, Assemblr-Edu platform is believed to attract their attention and make learning more interesting and interactive. Overall, this platform is proven to be effective in supporting innovative economic learning, with the average trial score reaching the very good category. The percentage of improvement in student response assessment is 95%.

With validation from experts and positive responses from learners, the Assemblr-Edu platform can be said to be an effective and innovative learning media. This kind of media development becomes important in the digital learning era, where learners need media that is not only interesting but also supports them in building deeper understanding. The use of learning media in the form of Assemblr-Edu platform is expected to create an interesting and correlated learning experience.

IV. CONCLUSIONS

Developing Assemblr-Edu platform for innovative learning is the right step to improve the effectiveness of the learning process. The media is able to present the concepts of learning materials visually and interactively, making it easier for students to understand the material being taught. Based on the results of expert validation, AR-based learning media using the Assemblr-Edu platform is declared feasible to use because it meets the criteria of concept clarity, visual quality, interactive interaction and relevance to learning objectives. Through this

media, students not only gain a better understanding but are also motivated to study harder.

REFERENCES

[1] N. Hafizah, "Media Pembelajaran Digital Generasi Alpha Era Society 5.0 Pada Kurikulum Merdeka," *Al-Madrasah: Jurnal Pendidikan Madrasah Ibtidaiyah*, vol. 7, no. 4, pp. 1675–1688, Oct. 2023, doi: 10.35931/am.v7i4.2699.

[2] R. Okra and Y. Novera, "Pengembangan Media Pembelajaran Digital IPA Yulia Novera," *JURNAL EDUCATIVE: Journal of Educational Studies* , vol. 4, no. 2, pp. 121–134, 2019.

[3] B. S. Permana, L. A. Hazizah, and Y. T. Herlambang, "Teknologi Pendidikan: Efektivitas Penggunaan Media Pembelajaran Berbasis Teknologi Di Era Digitalisasi," *Khatulistiwa: Jurnal Pendidikan dan Sosial Humaniora*, vol. 4, no. 1, pp. 19–28, Jan. 2024, doi: 10.55606/khatulistiwa.v4i1.2702.

[4] H. Hasriadi *et al.*, "Media Pembelajaran Inovatif Berbasis Lingkungan Pembelajaran Pendidikan Agama Islam di Pondok," *Madaniya*, vol. 4, no. 2, p. 531`539, 2023, doi: https://doi.org/10.53696/27214834.426.

[5] L. Kanti, S. F. Rahayu, E. Apriana, and E. Susanti, "Analisis Pengembangan Media Pembelajaran Berbasis Augmented Reality dengan Model POE2WE Pada Materi Teori Kinetik Gas: Literature Review," *Jurnal Pendidikan dan Ilmu Fisika*, vol. 2, no. 1, p. 75, Jun. 2022, doi: 10.52434/jpif.v2i1.1731.

[6] M. Masri, D. Surani, and A. Fricticarani, "Pengaruh Penggunaan Media Augmented Reality Assemblr Edu dalam Meningkatkan Minat Belajar Siswa SMP," *Jurnal Penelitian, Pendidikan dan Pengajaran: JPPP*, vol. 4, no. 3, pp. 209–216, Nov. 2023, doi: 10.30596/jppp.v4i3.16429.

[7] I. G. A. Sudarmayana, M. W. A. Kesiman, and N. Sugihartini, "Pengembangan Media Pembelajaran Berbasis Augmented Reality Book Simulasi Perkembangbiakan Hewan Pada Mata Pelajaran IPA Studi Kasus Kelas VI-SD Negeri 4 Suwug," *Kumpulan Artikel Mahasiswa Pendidikan Teknik Informatika (KARMAPATI)*, vol. 10, no. 1, pp. 38–49, 2021, doi: https://doi.org/10.23887/karmapati.v10i1.31245.

[8] P. R. P. I. Dewi, N. M. W. Wijayanti, and I. D. P. Juwana, "Efektivitas Penerapan Media Pembelajaran Digital Assemblr Edu pada Mata Pelajaran Matematika Di SMK Negeri 4 Denpasar," *Jurnal Pengabdian Kepada Masyarakat Widya Mahadi*, vol. 2, no. 2, pp. 98–109, 2022, doi: 10.5281/zenodo.6606066.

[9] E. I. Sholihah and S. F. Putri, "Pengembangan Media Pembelajaran Augmented Reality Dengan Menggunakan Assemblr Education Pada Mata Pelajaran Akuntansi Perusahaan Manufaktur," in *Prosiding National Seminar on Accounting, Finance, and Economics (NSAFE)*, 2024. Accessed: Feb. 24, 2025. [Online]. Available: http://conference.um.ac.id/index.php/nsafe/article/view/8822

[10] P. Chen, X. Liu, W. Cheng, and R. Huang, "A review of using Augmented Reality in Education from 2011 to 2016," *Innovations in smart learning*, pp. 13–18, 2017, doi: 10.1007/978-981-10-2419-1_2.

[11] A. S. Yudhistira, F. F. Purba, S. S. Munthe, and Y. I. Kristanto, "Media Pembelajaran Mengenal Olahraga Bola dengan Menerapkan Augmented Reality (AR)," *July*, pp. 0–12, 2021, [Online]. Available: https://www.researchgate.net/publication/352976752

[12] F. Ayu, D. Suryani, S. Maria, and A. Mahaputra Riau, "Pemanfaatan Augmented Reality sebagai Media Pembelajaran di Masa Pandemi pada Mata Kuliah Desain Grafis Utilization of Augmented Reality as a Learning Media During Pandemic on Graphic Design Courses," *Journal of Information Technology and Computer Science (INTECOMS)*, vol. 5, no. 1, 2022.

[13] A. Ariansyah, I. L. Shanty, T. Kurmalasari, L. Elfitra, M. Malik, and D. Irawan, "Assemblr Edu dan Canva Pada Materi Teks Cerpen Siswa Kelas IX Sekolah Menengah Pertama Negeri 4 Tanjungpinang Tahun Ajaran," *Santhet: Jurnal Sejarah, Pendidikan Dan Humaniora*, vol. 8, no. 1, pp. 528–545, 2023, doi: 10.36526/js.v3i2.3471.

[14] A. R. Sari, R. Okra, H. A. Musril, and S. Derta, "Perancangan Media Pembelajaran Biologi Berbasis Augmented Reality (AR) Menggunakan Assemblr Edu di SMA Negeri 1 Bukittinggi," *Jurnal Mahasiswa Teknik Informatika*, vol. 7, no. 2, 2023, doi: https://doi.org/10.36040/jati.v7i2.7247.

[15] R. C. Dhewy, "Pelatihan Analisis Data Kuantitatif untuk Penulisan Karya Ilmiah Mahasiswa," *Jurnal Pengabdian Kepada Masyarakat*, vol. 2, no. 3, pp. 4575–4578, 2022, doi: https://doi.org/10.53625/jabdi.v2i3.3224.

[16] E. Yana, A. Komara, and A. Anisah, "Pengembangan Game Edukatif Berbasis Android Sebagai Media Pembelajaran Akuntansi untuk Meningkatkan Analysis Ability Mahasiswa," *Assets: Jurnal Akuntansi dan Pendidikan*, vol. 8, no. 2, pp. 157–173, 2019, doi: https://doi.org/10.25273/jap.v8i2.4916.