JIPI (Jurnal Ilmiah Penelitian dan Pembelajaran Informatika)
Journal homepage: https://jurnal.stkippgritulungagung.ac.id/index.php/jipi
ISSN: 2540-8984
Vol. 9, No. 4, Desember 2024, Pp. 2418-2425

THE EFFECT OF AUGMENTED REALITY-BASED AUTOMATIC TRANSMISSION (ATAR) MEDIA ON BASIC KNOWLEDGE

Komarudin[*1)], Imam Muda Nauri[2)], Mardji[3)], Erwin Komara Mindarta[4)], Sudirman Rizki Ariyanto[5)]

1. Automotive Engineering Education Department, Faculty of Engineering, State University of Malang, Indonesia
2. Automotive Engineering Education Department, Faculty of Engineering, State University of Malang, Indonesia
3. Automotive Engineering Education Department, Faculty of Engineering, State University of Malang, Indonesia
4. Automotive Engineering Education Department, Faculty of Engineering, State University of Malang, Indonesia
5. Automotive Engineering Technology, Faculty of Vocational Studies, Universitas Negeri Surabaya, Indonesia

Article Info
Keywords: Augmented Reality, Automatic Transmission, Learning Media.

Article history:
Received 3 November 2024
Revised 18 November 2024
Accepted 25 November 2024
Available online 1 December 2024

DOI :
https://doi.org/10.29100/jipi.v9i4.6947

* Corresponding author.
Komarudin
E-mail address:
Komarudin.ft@um.ac.id

ABSTRACT
Innovative and interactive learning media were needed to graduate a workforce that was in accordance with the world of work. Automatic Transmission based on Augmented Reality operated using a smartphone can help students know the components, functions, and workings of the system. This is an application that combines the real world with the virtual world in the form of two or three dimensions projected in a real environment at the same time. Smartphones can be a digital media for delivering material. This research uses the (Analyze, Design, Develop, Implement, and Evaluate) model. This research aims to develop media based on AR. This media was evaluated by media experts, automotive experts, and students. The validity test results show that media was valid according to media experts and automotive experts. This study aims to develop this media to help students master the basic knowledge. Anova test results show that media has an effect on basic knowledge, because the media was attractive, easy to operate using a smartphone, and improved the ability to mention the names of transmission components, explain the functions and workings of system.

.

I. INTRODUCTION

IN August 2024, national car sales saw a slight increase of 2.79% compared to July 2024, with total sales reaching 76,304 units[1]. This increase was partly due to the launch of new models, which may include variants with Automatic Transmission (AT). The Indonesian automotive market shows that cars with AT are increasingly by consumers. This was driven by the comfort and ease of driving offered by automatic cars, especially in urban areas with heavy traffic [2]. Automotive Engineering Education Department (PTO) is an institution that prepares prospective teachers and prospective experts in the automotive field must respond to these conditions. Every graduate of PTO must master the competencies of AT maintenance and repair. Innovative and interactive learning media were needed to graduate a workforce that is in accordance with the world of work [3]. Previous research shows that the use of learning media in the classroom can help mastery of the material. Learning media mediates between basic knowledge and new material presented in lecture activities. Basic knowledge in technical learning to underpin subsequent learning [4].

However, the existing media in the automotive education study programme is not able to bridge the information conveyed to students. The results of observations in the automotive education study programme showed that the AT media was in the form of an AT unit, so that it could not show the inside. Knowledge of component names plays an important role to learn the function and workings of AT. For this purpose, the media is needed. One of the media that is currently widely used is AR.

Augmented Reality (AR) is a big step in technological innovation that provides fun services and experiences with aesthetics [5]. AR is an application of combining the real world with the virtual world in the form of two or three dimensions projected in a real environment at the same time [6]. AR like most digital technologies, includes algorithms, which in this case allow the distortion of reality, counting with additional information of interest to the user [7], therefore, this tool combines three dimensions of elements created in digital form, texts, images, and real videos, visible in the real world [8], AR technology currently covers a wide range of fields, as well as AR applied

JIPI (Jurnal Ilmiah Penelitian dan Pembelajaran Informatika)
Journal homepage: https://jurnal.stkippgritulungagung.ac.id/index.php/jipi
ISSN: 2540-8984
Vol. 9, No. 4, Desember 2024, Pp. 2418-2425

in education, video games, medicine, architecture, etc [9]. AT based on AR operated using a smartphone can help students know the components.

The development of smartphone technology has progressed and become one of the most widely used technologies [10]. The rapid development of science and technology today has an impact on all aspects of life. Smartphones can be a digital media for delivering material [11]. Android has become one of the mobile phone operating systems in Indonesia in recent decades [12]. Android smartphones are relatively affordable, making them accessible for purchase and practical to use as communication tools [13]. Android-based smartphones are usually installed with learning platforms. Learning using mobile phones makes it easier for students to learn without being limited by time and place [14]. Smartphone learning can improve thinking skills and learning motivation. Many studies have developed android-based learning, for example learning mathematics [15]. Therefore, the study aims to develop ATAR, an application that operates on a smartphone, allowing it to be used at home and offering broader learning opportunities compared to traditional AT media, aligning with the goals of the 'Merdeka Belajar' programme.

II. METHODS

This research uses the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) model. That model was chosen because this model has several advantages, including: 1) interdependent; 2) synergistic, 3) dynamic, 4) cybernetic, 5) systematic[16]. This model is suitable for developing learning media, as shown in Figure 1.

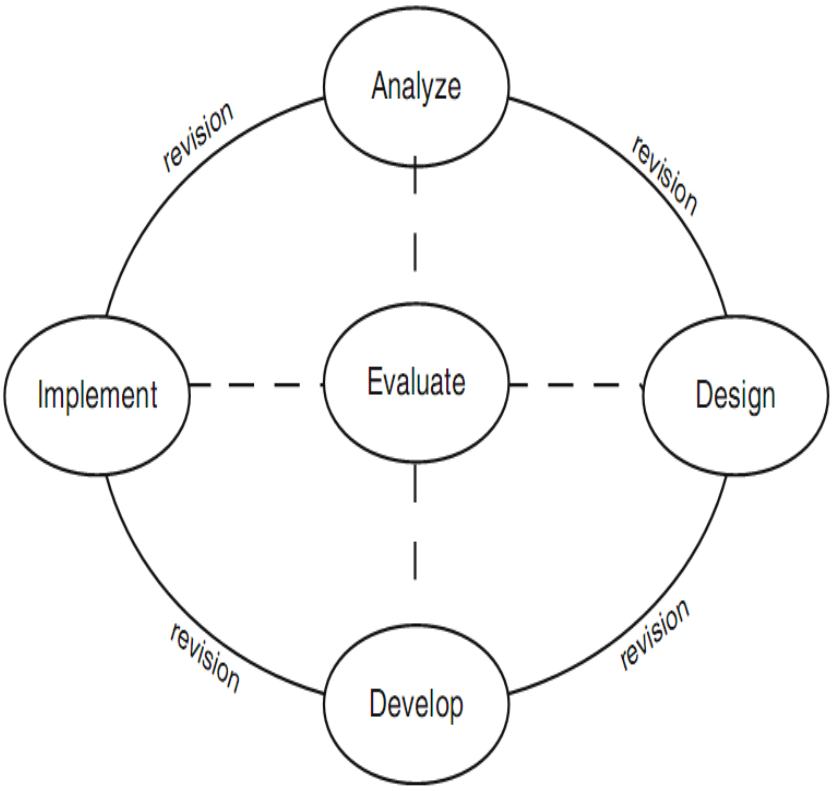


Figure 1. AR-based AT development flow

Analysis is the first step in developing media. There are several aspects that are analysed: 1) analysis of media on campus; 2) student analysis of learning conditions; 3) achievement of goals, the achievement aspect can be seen from 2 points of view, namely the teacher's point of view and the learner's point of view. The next step is design. AR media design is based on the results of needs analysis and conditions on campus. In the design process, researchers asked for input from automotive experts and subject matter experts. The third phase is Development. This phase depends on the previous two phases, namely the analysis and design phases. The development of ATAR media is made by paying attention to the ease of operation and the ability to convey information. The developed media is then implemented**.** The implementation phase is turning our plans into action. Those applications are implemented in the power transfer system course with a sample size of 90 students. The implementation results are

JIPI (Jurnal Ilmiah Penelitian dan Pembelajaran Informatika)
Journal homepage: https://jurnal.stkippgritulungagung.ac.id/index.php/jipi
ISSN: 2540-8984
Vol. 9, No. 4, Desember 2024, Pp. 2418-2425

then evaluated. The evaluation phase is the collection of research data that aims to test the application that has been developed.

A. Research instruments

The instruments used to collect research data were questionnaires filled out by experts, practitioners, students, and tests. The questionnaire for experts consisted of two parts, namely a questionnaire to measure content validity and construct validity. Meanwhile, questionnaires for practitioners and students were used to measure the practicality of the application with indicators of effectiveness, interactivity, efficiency, and creativity. Validity was collected using questionnaires filled out by automotive experts, educational practitioners. The validity test aims to measure the content and construct of the application. The results of the validity test are used to determine whether the application is valid or not. If it is not valid, then it must be corrected. In addition to the application evaluation expert questionnaire, filled out by students who have used it. ATAR media was tested on 3rd-semester students. The test aims to test the effectiveness of the media on improving the ability to mention the name, function of AT components.

B. Analysing research data

The research data was analysed descriptively (mean) to determine the validity criteria. The research data was also used to measure the reliability of the application by testing the Cronbach Alpha (α) value. Products and devices are said to be reliable if the α value > 0.6. Practicality questionnaires by teachers and students were analysed descriptively (mean). The criteria for determining validity and practicality are shown in Table 1.

TABLE 1.
VALIDITY CRITERIA

Value Range	Description
±0.7 - 1.00	Strong
±0.3 - 0.69	Moderate
±0.00 - 0.29	None/to weak

III. RESULTS AND DISCUSSION

The application has several specifications: application size 88 MB, does not require internet, android version at least 7.0, so it is easily accessible and easy to use. Figure 2 shows the front home page of the application.

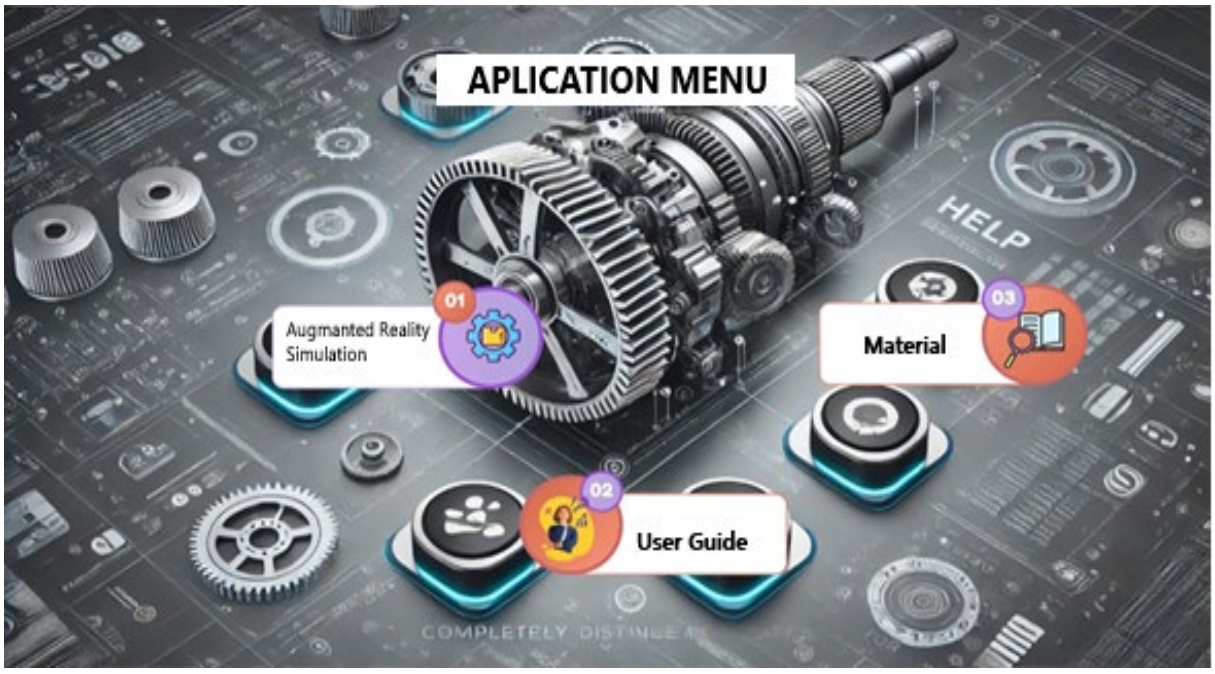


Figure 2. Application View

JIPI (Jurnal Ilmiah Penelitian dan Pembelajaran Informatika)
Journal homepage: https://jurnal.stkippgritulungagung.ac.id/index.php/jipi
ISSN: 2540-8984
Vol. 9, No. 4, Desember 2024, Pp. 2418-2425

The AR simulation menu displays (1) AT components; (2) materials that can be used to enrich knowledge. ATAR is easy to use and comes with a guide. The components of the AT on the media can be flicked, then it will display a picture of the real object. The user only scans the poster in Figure 5, and then a picture of the real object in the transmission will appear. Figure 3 is the shape of an object that describes an object in the manual book. ATAR technology can help the teaching and learning process [17], [18]. AR is an innovative technological tool very attractive to users, allowing dynamic and realistic information sharing.

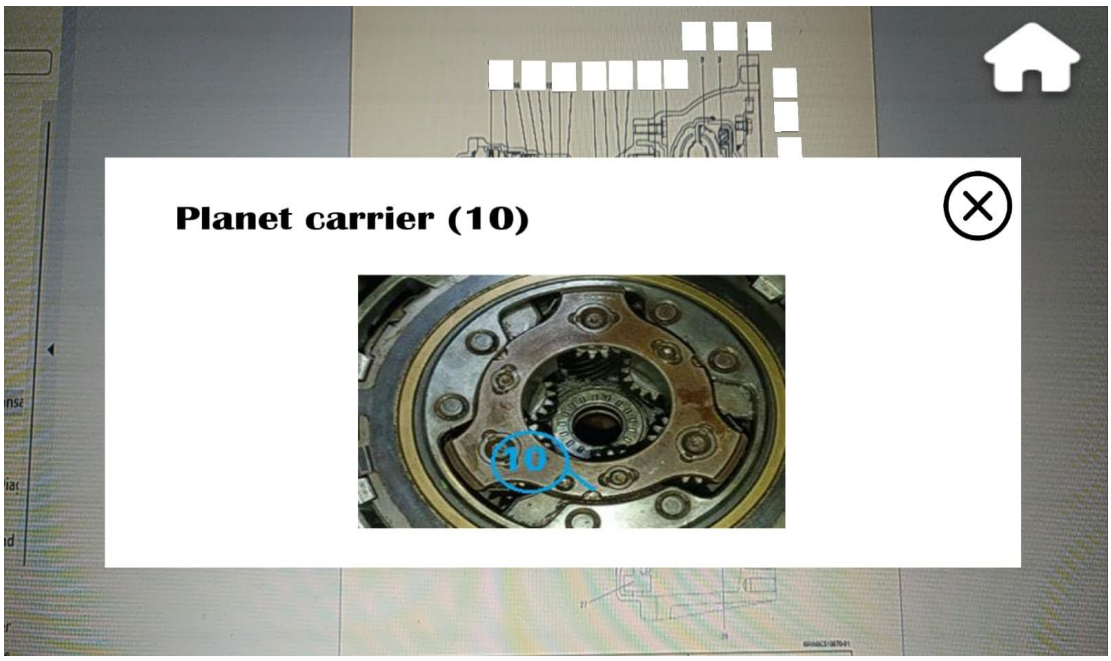
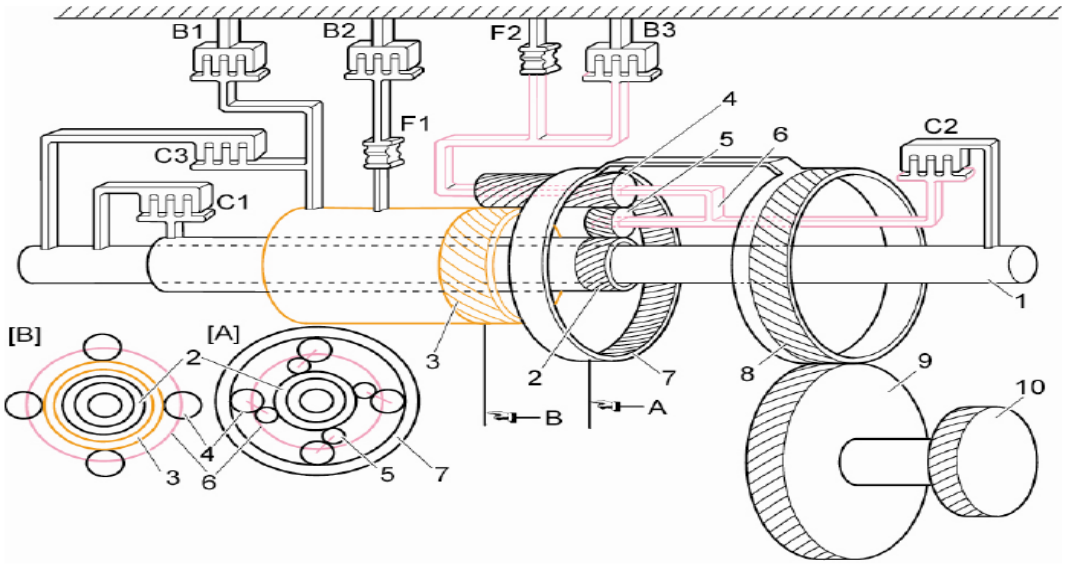


Figure. 3 2D shape of AT component

The guide menu contains procedures for using the ATAR application. The application usage guide plays an important role so that users can utilise this application to support learning activities on campus.



C1 : Forward clutch C2 : Direct clutch
B1 : O/D & 2nd brake B2 : 2nd brake B3 : 1st & Reverse brake
F1 : One-way clutch No.1 F2 : One-way clutch No.2
1.Input shaft 2.Front sun gear 3.Rear sun gear 4.Planetary long pinion 5.Planetary short pinion 6.Planetary carrier 7.Ring gear 8.Counter drive gear 9.Counter driven gear 10.Differential drive pinion

Figure 4. Material View

JIPI (Jurnal Ilmiah Penelitian dan Pembelajaran Informatika)
Journal homepage: https://jurnal.stkippgritulungagung.ac.id/index.php/jipi
ISSN: 2540-8984
Vol. 9, No. 4, Desember 2024, Pp. 2418-2425

Figure 4 shows the interface displayed when the user selects the material menu, which provides information about each component's name, location, and function. Ease of use is a key consideration in the development of this AR application. The application is designed to be accessible anytime and anywhere, without limitations of time or location. AR has the potential to enhance motivation and improve the overall learning experience [19]. According to Sirakaya and Cakmak [20], student achievement improved after receiving instruction using augmented reality (AR). This technology offers a wide range of benefits for enhancing the learning process [21]-[22]-[23]- [24].

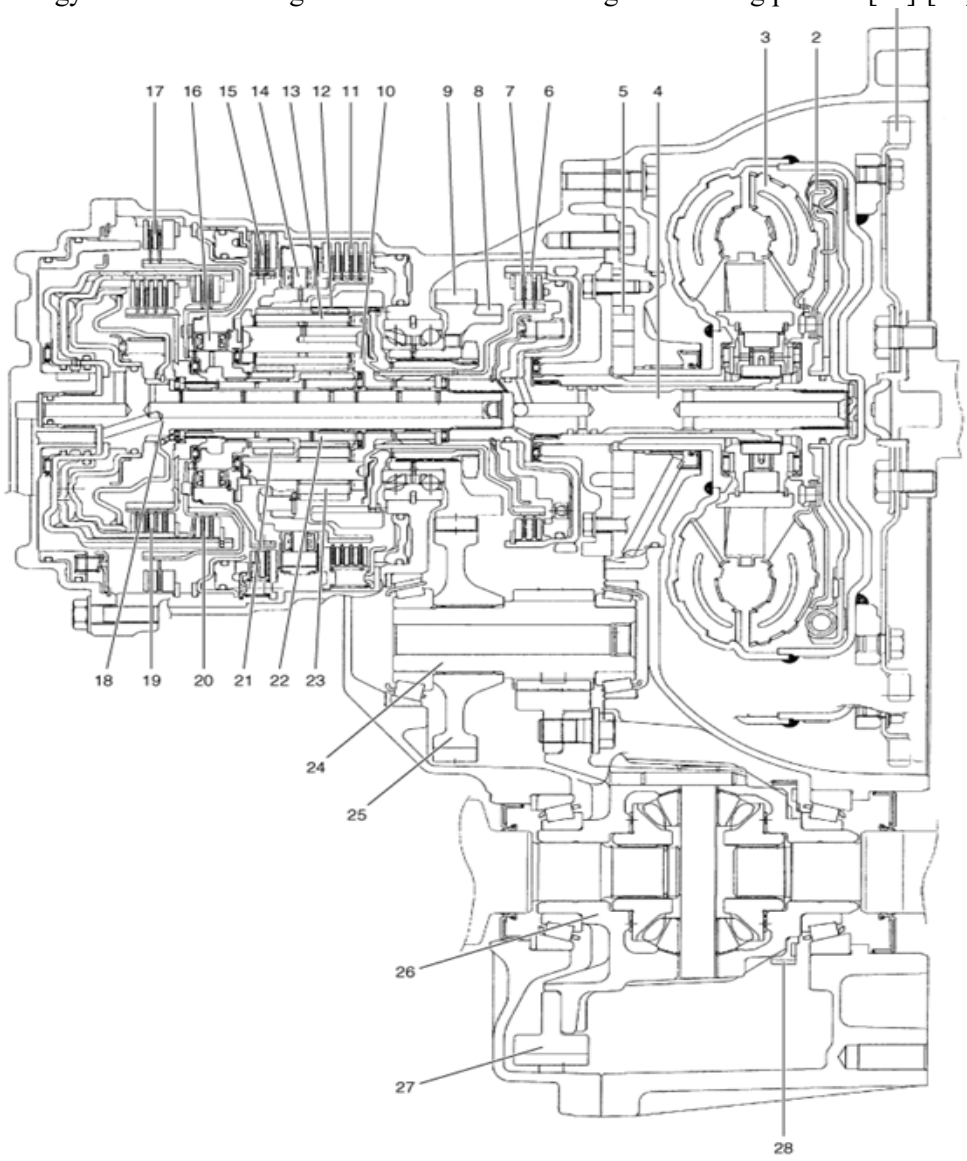


Figure 5. Image of AT in the Manual Book

Figure 5 illustrates an image taken from the manual book. Based on teaching experience, many undergraduate students in automotive education face challenges in memorizing the names of automatic transmission (AT) components. The AR-based AT media serves as a helpful tool to visualize and better understand the content presented in Figure 5.

A. Validity of ATAR application

The ATAR application was evaluated by media experts and automotive experts. Both validators provided assessments on: (1) media display aspect; (2) knowledge aspect; (3) convenience aspect; and (4) completeness aspect. The more complete the media developed, the more attractive it will be.

TABLE 2.
MEDIA EXPERT AND AUTOMOTIVE EXPERT RESPONSES

Component	Media Expert Validity Score	Automotive Expert Validity Score
Display	0.950	0.950
Knowledge	0.937	1
Convenience	1	1
Completeness	1	1

The validity test data of the ATAR application is shown in Table 2, which is the result of comparing the validity test by the validator with the validity criteria in Table 1. The validity of the display-aspect application received a value of 0.95, which means strong. The validity of the knowledge aspect application received a value of 1, which means strong. The validity of the convenience aspect is considered strong with a value of 1. The validity of the completeness aspect is considered strong with a value of 1. The application has advantages in: (1) the same appearance as the manual book, so that it can be a basic knowledge when practicing, (2) ease of use, (3) completeness of applications that help students to understand the material. According to the validator, this application was declared usable after a few revisions.

B. The effect of ATAR application on student knowledge

ATAR was implemented in the power transfer system lectures. This application was used during theory classes and practical classes. Those processes cannot be separated. Understanding AT material has an important role when doing a practicum. Data collection was done by giving pre-test and post-test. The test result data was tested using the ANOVA test, is shown in Teble 3.

TABLE 3.
ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	2170.278	1	2170.278	7.150	.009
Within Groups	23675.984	78	303.538		
Total	25846.262	79			

The data in Table 3 shows a probability value less than 0.05, indicating a significant difference in the ability to identify and explain the functions of AT components before and after using the application. This ability is part of the foundational knowledge required for performing maintenance and repair of transmission systems. The results of this study are consistent with findings reported by Pratama *et al*. [25] who stated that augmented reality interactive media influences basic skills and learning interests, as well as the research of Teoh and Neo [26] which showed that such media has a direct impact on basic knowledge. Basic knowledge is explicit knowledge, conceptual knowledge, and metacognitive knowledge that learners master when entering learning situations that are relevant to obtaining new information [27]. The AT media can be operated using a smartphone, which functions not only as a communication tool but also as a learning medium through the utilization of AR [28]. Such media has the potential to enhance learners' basic skills [29], [30].

Research by Novaliendry *et al*. [29] and Selindawati *et al.* [31] stated that the ability to acquire basic knowledge is an important component in learning that must be improved through the use of media. Media was used in building basic knowledge in the course [32]. According to Bodemer and Ploetzner [33], using interactive visualisation can reduce the lack of basic knowledge. Visualisation is the main key in providing a deep understanding to participants [34]. The use of media in this study was an effort to help students visualise. This media is a learning media in the PTO, expected to help students think coherently. Learning media helps students to visualise information. AR to increase student interest and learning outcomes in the learning process [35]. Interesting media helps students to memorise the components of AT. One of the essential competencies to be mastered is the ability to orally explain AT components, which reflects communication skills. Augmented reality (AR) media has been shown to support the development of these skills [31]. Selecting the appropriate media is a key factor in effective automotive learning activities.

IV. CONCLUSION

This research has successfully developed an AR-based application to help students master the basic concepts of AT systems. ATAR is an application designed to help students better understand instructional material. This media supports students in translating static images into more realistic representations. Validation results indicated that

the application's interface is highly attractive and effectively facilitates knowledge delivery. It was also found to be user-friendly and well-aligned with the objectives of media development. ANOVA analysis results demonstrate that the application significantly enhances students' ability to identify component names, describe their functions, and understand system operations. However, further development is needed, particularly the integration of three-dimensional component models to provide a more comprehensive learning experience.

ACKNOWLEDGMENT

Thanks to LPP UM for funding the development of AT media based on AR.

REFERENCES

[1] F. Sandi, "Terungkap! Ini Pemicu Penjualan Mobil Agustus 2024 Naik 2,79%." CNBC Indonesia, 2024. [Online]. Available: https://www.cnbcindonesia.com/news/20240917101312-4-572290/terungkap-ini-pemicu-penjualan-mobil-agustus-2024-naik-279

[2] A. Widiutomo, "Tren Penjualan Mobil Masih Turun, Gaikindo Lakukan Koreksi Target Penjualan." OTODRIVER, 2024. [Online]. Available: https://otodriver.com/berita/2024/tren-penjualan-mobil-masih-turun-gaikindo-lakukan-koreksi-target-penjualan-tredfcfjlan

[3] T. P. Socrates and F. Mufit, "Efektivitas Penerapan Media Pembelajaran Fisika Berbasis AR: Studi Literatur," *EduFisika J. Pendidik. Fis.*, vol. 7, no. 1, pp. 96–101, 2022, doi: 10.59052/edufisika.v7i1.19219.

[4] N. Choo, P. Fieger, P. Wells, and K. Tseng, "The Influence of Basic Knowledge on The Self-Efficacy of Students Enrolled in A Tertiary Introductory Accounting Course," *Account. Educ.*, no. September, pp. 1–25, 2024, doi: 10.1080/09639284.2024.2405603.

[5] S. D. Maharani and S. S. E. Dewie, "Analisis Kebutuhan Media Augmanted Reality Pada Peserta Didik Kelas V Sd Plus Igm Palembang," *Inov. Sekol. Dasar J. Kaji. Pengemb. Pendidik.*, vol. 10, no. 1, pp. 34–45, 2023, doi: 10.36706/jisd.v10i1.21363.

[6] D. Indriyani, M. Muhfahroyin, and H. Santoso, "Pengaruh Discovery Learning Berbasis AR terhadap Hasil Belajar Siswa," *Biolova*, vol. 4, no. 2, pp. 107–113, 2023, doi: 10.24127/biolova.v4i2.4032.

[7] Wildan, S. Hadisaputra, L. R. T. Savalas, B. D. Laksmiwati, and Supriadi, "Development of AR-Based Online Learning Media to Improve Students' Mental Models on the Topic of Environmental Pollution," *Proc. 1st Nusa Tenggara Int. Conf. Chem. (NITRIC 2022)*, pp. 194–204, 2023, doi: 10.2991/978-94-6463-130-2_20.

[8] L. Chamba-Eras and J. Aguilar, "AR in a Smart Classroom - Case Study: SaCI," *Rev. Iberoam. Tecnol. del Aprendiz.*, vol. 12, no. 4, pp. 165–172, 2017, doi: 10.1109/RITA.2017.2776419.

[9] J. Cardenas-valdivia, J. Flores-alvines, O. Iparraguirre-villanueva, and M. Cabanillas-carbonell, "AR for Quechua Language Teaching-Learning : A Systematic Review," *Int. J. Interact. Mob. Technol.*, vol. 17, no. 06, pp. 116–138, 2023.

[10] A. Fernanda, A. M. Retta, and A. Isroqmi, "Pengembangan Media Pembelajaran Virtual Reality Berbasis Android pada Pembelajaran Matematika SMP," *Ideguru J. Karya Ilm. Guru*, vol. 9, no. 3, pp. 1612–1618, 2024, doi: 10.51169/ideguru.v9i3.1231.

[11] A. Salsabila and A. K. Putra, "Visualisasi Proses Vulkanisme melalui Media Pembelajaran Animasi berbasis AR sebagai Media Digital Geografi," *Cetta J. Ilmu Pendidik.*, no. June, 2024, doi: 10.37329/cetta.v7i2.3296.

[12] Asmianto, M. Hafiizh, D. Rahmadani, K. Pusawidjayanti, and S. Wahyuningsih, "Developing Android-Based Interactive E-Modules on Trigonometry to Enhance the Learning Motivation of Students," *Int. J. Interact. Mob. Technol.*, vol. 16, no. 2, pp. 159–170, 2022, doi: 10.3991/ijim.v16i02.27503.

[13] I. Al Ikhsan, N. Supriadi, and W. Gunawan, "Media Pembelajaran Berbasis AR: Materi Bangun Ruang Sisi Datar," *JKPM (Jurnal Kaji. Pendidik. Mat.*, vol. 7, no. 2, p. 289, 2022, doi: 10.30998/jkpm.v7i2.12839.

[14] M. A. Abbas, G. J. Hwang, S. Ajayi, G. Mustafa, and M. Bilal, "Modelling and Exploiting Taxonomic Knowledge for Developing Mobile Learning Systems to Enhance Children's Structural and Functional Categorization," *Comput. Educ. Artif. Intell.*, vol. 2, no. October 2020, p. 100007, 2021, doi: 10.1016/j.caeai.2021.100007.

[15] Sunismi, "Developing Guiged Discovery Learning Materials Using Mathematics Mobile Learning Application As an Alternative Media for The Students Calculus II," *Cakrawala Pendidik.*, vol. 34, no. 3, pp. 1–14, 2004.

[16] J. A. Putra, Enjang Ali Nurdin, Nusuki Syariati Fathimah, and Wahyudin, "Design and Develop Interactive Multimedia Applying Problem-Based Learning to Enhance Problem-Solving Skills," *bit-Tech*, vol. 6, no. 3, pp. 329–339, 2024, doi: 10.32877/bt.v6i3.1207.

[17] I. N. Sari and D. Sulisworo, "Pengembangan LKPD Berbasis AR Sebagai Media Pembelajaran Matematika," *JNPM (Jurnal Nas. Pendidik. Mat.*, vol. 7, no. 1, p. 1, 2023, doi: 10.33603/jnpm.v7i1.5347.

[18] M. S. Mahanan, N. H. Ibrahim, J. Surif, and C. K. Nee, "AR Module for Learning Changes of Matter in Chemistry," *Int. J. Interact. Mob. Technol.*, vol. 1, no. 23, pp. 72–88, 2021.

[19] M. Billinghurst and A. Dünser, "AR in the classroom," *Computer (Long. Beach. Calif).*, vol. 45, no. 7, pp. 56–63, 2012, doi: 10.1109/MC.2012.111.

[20] M. Sirakaya and E. K. Cakmak, "The Effect of AR Use on Achievement, Misconception and Course Engagement," *Contemp. Educ. Technol.*, vol. 9, no. 3, pp. 297–314, 2018, doi: 10.30935/cet.444119.

[21] A. R. M. Cuperschmid, M. G. Grachet, and M. M. Fabrício, "Desenvolvimento de um Ambiente de Realidade Aumentada Para Montagem de Parede Pré-fabricada em Wood-frame a Partir de Modelo BIM," *Ambient. Construído*, vol. 16, no. 4, pp. 63–78, 2016.

[22] W. J. Shyr, C. J. Tsai, C. M. Lin, and H. M. Liau, "Development and Assessment of AR Technology for Using in an Equipment Maintenance and Diagnostic System," *Sustain.*, vol. 14, no. 19, 2022, doi: 10.3390/su141912154.

[23] A. N. Rosman, N. A. Samsudin, A. Ismail, M. S. Aripin, and S. K. A. Khalid, "AR application for location finder guidance," *Indones. J. Electr. Eng. Comput. Sci.*, vol. 13, no. 3, pp. 1237–1242, 2019, doi: 10.11591/ijeecs.v13.i3.pp1237-1242.

[24] R. Nóbrega, J. Jacob, A. Coelho, J. Weber, J. Ribeiro, and S. Ferreira, "Mobile Location-based AR Applications for Urban Tourism Storytelling," *EPCGI 2017 - 24th Encontro Port. Comput. Graf. e Interacao*, vol. 2017-Janua, no. October, pp. 1–8, 2017, doi: 10.1109/EPCGI.2017.8124314.

[25] F. Wedi Pratama, F. N. Nova, D. Prayama, and T. Gusman, "Media Pembelajaran Interaktif Fabrikasi PCB Berbasis AR," *JITSI J. Ilm. Teknol. Sist. Inf.*, vol. 3, no. 3, pp. 81–87, 2022, doi: 10.30630/jitsi.3.3.93.

[26] B. S. Teoh and T. Neo, "Interactive Multimedia Learning : Students ' Attitudes And Learning Impact In An Animation Course," *Turkish Online J. Educ. Technol.*, vol. 6, no. 4, 2007.

[27] T. Liu, Y. Lin, and F. Paas, "Effects of Basic Knowledge On Learning From Different Compositions Of Representations In A Mobile Learning Environment," *Comput. Educ.*, vol. 72, pp. 328–338, 2014, doi: 10.1016/j.compedu.2013.10.019.

[28] D. Novaliendry, K. S. Saltriadi, N. Mahyuddin, T. Sriwahyuni, and N. Ardi, "Development of Interactive Media Based on AR for Early Childhood Learning Around the Home," *Int. J. Interact. Mob. Technol.*, vol. 16, no. 24, pp. 4–20, 2021.

[29] S. Kalyuga, "Effects of Learner Basic Knowledge and Working Memory Limitations on Multimedia Learning," *Procedia - Soc. Behav. Sci.*, vol. 83, no. 1965, pp. 25–29, 2013, doi: 10.1016/j.sbspro.2013.06.005.

[30] K. Komarudin, "Interactive Multimedia Engine Management System (EMS) to Improve Basic knowledge and Problems Solving," *J. Pendidik. Kejuru. UNY*, vol. 26, no. 1, pp. 52–62, 2020, doi: https://doi.org/10.21831/jptk.v26i1.29143.

[31] Selindawati, W. R. R. Hayu, and G. Gunadi, "Pengembangan Media Pembelajaran Berbasis AR untuk Meningkatkan Keterampilan Komunikasi pada Mata Pelajaran IPAS," *Karimah Tauhid*, vol. 3, no. 4, pp. 5143–5156, 2024, doi: 10.30997/karimahtauhid.v3i4.13025.
[32] S. J. Bennett and M. J. Brennan, "Interactive Multimedia Learning In Physics," *Aust. J. Educ. Technol.*, vol. 12, no. 1, 1993, doi: https://doi.org/10.14742/ajet.2031.
[33] D. Bodemer and R. Ploetzner, "Supporting Learning With Interactive Multimedia Through Active Integration Of Representations," *Instr. Sci.*, vol. 33, pp. 73–95, 2005, doi: 10.1007/s11251-004-7685-z.
[34] G. Shabiralyani, K. S. Hasan, N. Hamad, and N. Iqbal, "Impact of Visual Aids in Enhancing the Learning Process Case Research: District Dera Ghazi Khan.," *J. Educ. Pract.*, vol. 6, no. 19, pp. 226–233, 2015.
[35] K. D. Selfia, "Pengembangan Media Pembelajaran Dasar Desain Grafis Berbasis AR Bagi Siswa Smk Kelas X," *J. Visi Ilmu Pendidik.*, vol. 14, no. 2, p. 164, 2022, doi: 10.26418/jvip.v14i2.52915.