

## NEEDS ANALYSIS FOR DEVELOPING AN AUGMENTED REALITY-BASED ECOSYSTEM MODULE ASSISTED BY ASSEMBLR APPLICATION FOR GRADE V ELEMENTARY SCHOOL

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### ABSTRACT

Technology is developing very rapidly and impacts all aspects, one of which is education. Based on these conditions, teachers must be able to conduct learning that is adaptive to technology. One of the utilization of technology in learning is learning media. IT-based learning media is very popular with students because it looks attractive and facilitates student understanding when learning. However, based on the facts, using technology media is not optimal. Based on these problems, this study aims to analyze the need for AR-based module development assisted by the Assemblr application. Researchers use qualitative methods. The data accumulation used by researchers is interviews, observations, and filling out online questionnaires. The results showed that 1) Students are already proficient in using cell phones and depend on gadgets. 2) Students like science learning on ecosystem material. 3) Students like colorful media such as videos. 4) The school needs to have its module. 5) Teachers and students must become more familiar with Augmented Reality technology. 6) Learning media that is often used package books and PPT so that it is less varied.

**Keywords:** augmented reality; learning media; needs analysis

### INTRODUCTION

Education is a means of forming quality resources. The quality of education can be improved from several aspects, one of which is learning activities.<sup>1</sup> One aspect that supports learning activities is learning media. Learning media is an intermediary for communication in learning activities to stimulate students' minds so that the realization of the learning process and learning objectives can be adequately achieved.<sup>2</sup> Anderson (1976) states that media are classified into ten types: audio media, print media, print audio media, print audio, silent visual projection, silent audio-visual projection, motion visual, motion audio visual, physical objects, human environment, and computers.<sup>3</sup>

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<sup>1</sup> Yeka Hendriyani et al., "Analisis Kebutuhan Pengembangan Media Pembelajaran Berbasis Video Tutorial," *JTIP: Jurnal Teknologi Informasi Dan Pendidikan* 11, no. 2 (2018): 86.

<sup>2</sup> Musstofa Abi Hamid et al., *Media Pembelajaran* (Medan: Yayasan Kita Menulis, 2020), 4.

<sup>3</sup> Muhammad Hasan et al., *Media Pembelajaran* (Tahta Media Group, 2021), 87.



The learning process with learning media is inseparable. The role of learning media is very important in improving the quality of learning and can create an interesting and enjoyable learning process.<sup>4</sup> As with the elementary school level, the learning media used certainly adjusts the user's age. Piaget states that elementary school students are in the concrete operational stage, so media is needed.<sup>5</sup> So that elementary school children's learning tends to be concrete and tangible.<sup>6</sup> Learning media is currently experiencing a very rapid development in this technological age.

Given that technology is currently developing, this certainly affects and cannot be separated in all aspects, one of which is education.<sup>7</sup> One of the utilization of technology in education is learning media. The existence of technology-based interactive learning media has an important position in building students' potential.<sup>8</sup> Technology-based learning media certainly has benefits, which can facilitate and strengthen the interaction between teachers and students and facilitate the course of learning so that effective and efficient learning can be created.<sup>9</sup> Students need interactive learning media because it tends to be interesting and can increase learning motivation. So that it affects learning outcomes and students' memory in understanding the material.<sup>10</sup>

Teacher innovation in the age of technology needs to be developed because learning media must be adaptive to the times. This is supported by the opinion of Opan Arifudin in his book, which states that educators need to follow the times; this is very important because everything will transform according to the times. Likewise, with

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<sup>4</sup> Fifit Firmandani, "Media Pembelajaran Berbasis Teknologi Sebagai Inovasi Pembelajaran Era Revolusi Industri 4.0," *Prosiding Konferensi Pendidikan Nasional 2*, no. 1 (2020): 94.

<sup>5</sup> Agustina Tyas Asri Hardini Hardini and Arlita Akmal, "Penerapan Metode Snowball Throwing Berbantuan Media Konkret Untuk Meningkatkan Keaktifan Dan Hasil Belajar IPA Siswa Kelas IV Sekolah Dasar," *Jurnal Pendidikan Dasar PerKhasa* 3, no. 1 (2017): 37.

<sup>6</sup> Febriani Nur Fatimah and Supriyono, "Penggunaan Media Benda Konkret Pada Tema Lingkungan Untuk Peningkatan Hasil Belajar Siswa Di Sekolah Dasar," *JPGSD* 1, no. 2 (2013): 2.

<sup>7</sup> Luthviana Kanti et al., "Analisis Pengembangan Media Pembelajaran Berbasis Augmented Reality Dengan Model POE2WE Pada Materi Teori Kinetik Gas Literature Review," *Jurnal Pendidikan Dan Ilmu Fisika* 2, no. 1 (2022): 76.

<sup>8</sup> Unik Hanifah Salsabila et al., "Kedudukan Teknologi Pendidikan Islam Di Era Globalisasi," *NUSANTARA: Jurnal Pendidikan Dan Ilmu Sosial* 3, no. 3 (2021): 403.

<sup>9</sup> Mashud Syahroni, Firstya Evi Dianastiti, and Fifit Firmadani, "Pelatihan Media Pembelajaran Berbasis Teknologi Informasi Untuk Meningkatkan Keterampilan Guru Dalam Pembelajaran Jarak Jauh," *International Journal of Community Service Learning* 4, no. 3 (2020): 171.

<sup>10</sup> Isma Ramadhani Lubis and Jaslin Ikhsan, "Pengembangan Media Pembelajaran Kimia Berbasis Android Untuk Meningkatkan Motivasi Belajar Dan Prestasi Kognitif Peserta Didik SMA," *Jurnal Inovasi Pendidikan IPA* 1, no. 2 (2015): 200.

education, teachers must be creative and innovative in creating fun and interactive learning. Teachers should be able to use technology-based media such as Android-based in learning.<sup>11</sup>

However, based on field facts obtained from observations, it is stated that learning runs effectively with simple media and learning resources. The primary learning resources used are textbooks by the current curriculum, and the often-used learning media is PPT. Variations in learning media are also carried out by displaying video media sourced from existing YouTube channels. The types of technology-based learning media vary greatly, but the media used are less varied, and sometimes students feel bored.<sup>12</sup> This suggests that it is important to introduce a variety of technology-based learning media that students have never known before.

Behind the importance of technology-based media, conventional media also must be integrated into learning. Therefore, researchers want to combine conventional media with technology-based media, namely Augmented Reality (AR) based modules. AR-based technology is important because it can make it easier for students to understand abstract material. AR technology is a technology that can realize 3D virtual objects in the real world.<sup>13</sup> AR-based media is very suitable for any lesson, especially in science. Some science lessons cannot be seen directly. With AR-based technology, students can see virtual objects visualized in the real world. Creating AR-based media certainly requires supporting applications, one of which is Assemblr. Assemblr is an application with Augmented Reality (AR) technology that is useful for creating 3D objects with markers that will be realized through the AR camera feature so that objects look real.<sup>14</sup>

The combination of conventional media with technology, applications used in making AR objects, and the focus of the material developed is the latest in this study. Based on the above problems, analyzing the needs of Augmented Reality (AR) based learning media is interesting to study. Hence, this research focuses on the needs or needs

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<sup>11</sup> Opan Arifudin et al., *Media Pembelajaran Pendidikan Anak Usia Dini* (Penerbit Widina, 2021), 1.

<sup>12</sup> Observasi Lapangan

<sup>13</sup> Muhammad Rizky Mubaraq, Helmi Kurniawan, and Ahmad Saleh, "Implementasi Augmented Reality Pada Media Pembelajaran Buah-Buahan Berbasis Android," *IT Journal* 6, no. 1 (2018): 90.

<sup>14</sup> Amirah Z Hermawan Putri, Setya C Wibawa, and Amalia Ruhana, "Pengembangan Aplikasi Pembelajaran Bumbu Dan Rempah Berbasis Augmented Reality Bernama 'WORD OF HERBS AND SPICES,'" *Jurnal Bosaparis: Pendidikan Kesejahteraan Keluarga* 12, no. 2 (2021): 71.

that are the basis for making AR-based media summarized in the article entitled: Needs Analysis For Developing An Augmented Reality-Based Ecosystem Module Assisted By Assemblr Application For Grade V Elementary School.

## RESEARCH METHODS

This research uses qualitative methods. Qualitative methods are called naturalistic conditions because they are used in natural conditions. The researcher's position in this method is very important and is a crucial instrument. Data collection techniques are triangulated, data analysis is inductive, and qualitative research results emphasize meaning. This research was conducted in one of the elementary schools in Yogyakarta, with the research subjects being 20 elementary school teachers and 30 students grade v.

So, researchers analyze the need to manufacture Augmented Reality-based Ecosystem Modules assisted by the Assemblr application. The defining stage in this study aims to define the requirements in learning by analyzing the purpose of making products, analyzing material boundaries, and the needs needed.<sup>15</sup> The data collection techniques used are interviews, observations, and the distribution of online questionnaires to teachers and students of class V Elementary School.

The interview is a data collection technique that obtains facts in the field to achieve goals by interacting directly between the two parties. This is done by asking a number of questions to the respondent.<sup>16</sup> Observation is a data collection technique based on direct observation and recording<sup>17</sup> systematic events, objects observed, etc., to obtain the necessary data per the research.<sup>18</sup> Researchers made observations by surveying the intended class to determine the state of the field and distributing questionnaires to determine the data and the percentage of data obtained. Questionnaires can be called questionnaires, which can be interpreted as data collection techniques using several

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<sup>15</sup> I Dewa Gede Putr Wirayasa, I Putu Darmayasa, and I Made Satyawan, "Pengembangan Instrumen Penilaian Hasil Belajar Ranah Kognitif Model 4D Pada Materi Sepak Bola Berdasarkan Kurikulum 2013," *Jurnsl Pendidikan Jasmani Olahraga Dn Kesehatan* 8, no. 3 (2020): 83.

<sup>16</sup> Mita Rosaliza, "Wawancara, Sebuah Interaksi Komunikasi Dalam Penelitian Kualitatif," *Jurnal Ilmu Budaya* 11, no. 2 (2015): 79.

<sup>17</sup> Tsaqifa Taqiyya Ulfah and Aninditya Sri Nugraheni, "Pemahaman Fonetik Siswa Sekolah Dasar Terhadap Teknik Membaca Suara," *Medan Makna: Jurnal Ilmu Kebahasaan Dan Kesastraan* 18, no. 2 (2020): 205.

<sup>18</sup> Jonathan Sarwono, *Metode Penelitian Kuantitatif & Kualitatif* (Yogyakarta: Graha Ilmu, 2006), 224.

questions that respondents will answer according to their respective choices as a result of research.<sup>19</sup> After obtaining the results, it is analyzed by comparing and strengthening with relevant previous research.


## RESULT AND DISCUSSION

### RESULT

#### LEARNING MEDIA THAT TEACHERS OFTEN USE

All teachers who became research subjects with a percentage of 100% stated that learning requires learning media. The role of media is very important because it makes it easier to convey material and increase learning motivation.<sup>20</sup>

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1. Apakah guru memerlukan sebuah media pembelajaran dalam menyampaikan materi pada siswa? 

20 jawaban

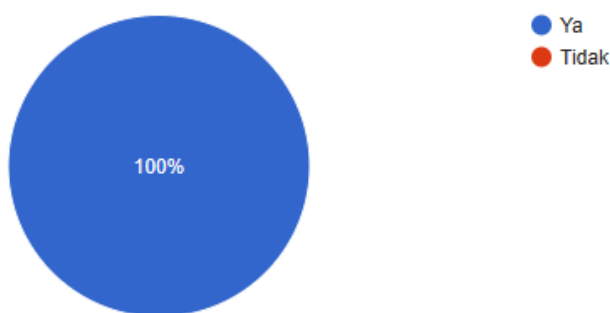


Diagram 1  
Percentage of learning media needs

However, students feel bored over time because the media used could be more innovative and varied. Field facts state that it cannot be denied that the most frequently used learning method is the lecture method. In explaining material to students, most teachers use the lecture learning method, which is very popular in Indonesia.<sup>21</sup> However,

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<sup>19</sup> Puji Purnomo and Maria Sekar Palupi, "Pengembangan Tes Hasil Belajar Matematika Materi Menyelesaikan Masalah Yang Berkaitan Dengan Waktu, Jarak Dan Kecepatan Untuk Siswa Kelas V," *Jurnal Penelitian (Edisi Khusus PGSD)* 20, no. 2 (2016): 153.

<sup>20</sup> Nurul Audie, "Peran Media Pembelajaran Meningkatkan Hasil Belajar Peserta Didik," *Prosiding Seminar Nasional Pendidikan FKIP* 2, no. 1 (2019): 587.

<sup>21</sup> I Ketut Widiara, "Blended Learning Sebagai Alternatif Pembelajaran Di Era Digital," *PURWADITA* 2, no. 2 (2018): 53.

teachers also try to vary learning by combining the methods of discussion, practicum, direct observation, question and answer, and practice questions.

Based on the data above, the role of technology in learning has yet to be maximized. However, teachers sometimes provide learning variations through direct observation, simple practicum, learning videos on the existing YouTube channel, and simple props. The majority of teachers utilize existing learning media. The ability and innovation of teachers in developing media needs to be improved. Based on field facts, teachers can use simple technology-based media such as PPT, Google Slides, teaching aids, videos, and audio-based PPT. Based on data obtained from Google Forms, 60% of teachers have been able to make simple media such as videos, teaching aids, and pictorial media, and 40% of teachers have not been able to create media.<sup>22</sup>

## 2. Apakah semua guru bisa membuat media pembelajaran baik dalam bentuk wujud video, alat peraga, atau buku cetak bergambar?

20 jawaban

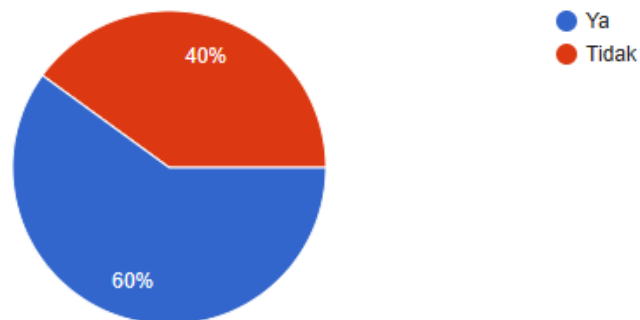


Diagram 2  
Percentage of Teachers' Skill in Making Learning Media

The use of print media in learning is good, but there must be different variations. This is also supported by the teacher's opinion that the school has no module. The importance of developing media and introducing media more widely because there are still many types of technology-based media that teachers and students need to learn, one of which is Augmented Reality technology. Teachers and students need to become more familiar with AR. The facilities to create and implement AR in schools are fulfilling because the media can be created and used through cell phones. In addition, the school also provides wifi so that school facilities support AR-based learning. Science learning at

<sup>22</sup> Teacher interview and Questionnaire, January 31, 2023.

school occurs simply with simple practicum, direct observation, and others, so AR can facilitate concrete, interesting learning and provide new experiences for teachers and students.

Technology-adaptive media, when combined with conventional media, is excellent. No matter how advanced technology is, print media is still important in learning. Based on these field facts, it is very important to discuss, and solutions must be given to improve the future.

### **LEARNING MEDIA THAT STUDENTS ARE INTERESTED**

Science learning is one of the learning media that students are interested in because the material is relevant to their daily lives.<sup>23</sup> This is supported by existing field facts, stating that students like science because learning is exciting, interesting, and can be seen in real life. However, not all science processes can be seen directly and require interactive learning media. Interactive and innovative media accompanied by print media with pictures, colors, animations, cartoons, nature, and videos greatly interest students. They find such media interesting, fun, exciting, and easy to remember.<sup>24</sup>

Students in interviews stated that learning using interactive and varied media facilitates student understanding. Teachers' opinions also support this. The data proves that 100% of teachers who became research subjects stated that students are more active and easy to understand lessons through media. Students in the age of technology are adept at using cell phones. For gadgets to be useful for positive things, Android-based learning is needed. However, android-based learning must be balanced with conventional learning. Pictorial and colored print media are very attractive to students. The following statement reached a percentage of 95%. In addition, students like 3D media because it is interesting, moving, varied, and exciting. 3D objects can be implemented through AR technology. However, all fifth-grade students with a percentage of 100% need to become more familiar with AR technology.

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<sup>23</sup> Ahmad Habib, I Made Astra, and Erry Utomo, "Media Pembelajaran Abad 21: Kebutuhan Multimedia Interaktif Bagi Guru Dan Siswa Sekolah Dasar," *JARTIKA: Jurnal Riset Teknologi Dan Inovasi Pendidikan* 3, no. 1 (2020): 28.

<sup>24</sup> Student Interview, January 31, 2023.

## DISCUSSION

Based on the study's results, it can be analyzed that most teachers in learning use the lecture method. The lecture method does play an important role in explaining material to students, but it is better to use media. However, the facts state that, until now, some teachers still need to learn media facilities to use the lecture method.<sup>25</sup> Teacher innovation in packaging learning is necessary for the implementation to be more varied so students feel bored.<sup>26</sup> Students will become passive when learning takes place, so they need more motivation to understand. Students tend not to listen to the teacher when explaining the material, so the class becomes crowded because students chat with their friends.<sup>27 28</sup>

In addition, by using the lecture method alone without media, the teacher will find it challenging to know the level of student understanding of the material that has been delivered. Students also become reluctant to ask questions during the question and answer session; no one asks, so it cannot guarantee the level of student understanding.<sup>29</sup>

Elementary students prefer media accompanied by images or animations that have attractive colors.<sup>30</sup> Classroom teachers also stated that the learning media students like are pictures, videos, animations, and others.<sup>31</sup> Media with colorful images tend to be liked by students.<sup>32</sup> It can be concluded that students enjoy digital-based media. However, they have yet to be able to maximize technology in the learning process.<sup>33</sup> This is also

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<sup>25</sup> Arsad Bahri, Wahyu Hidayat, and Abdul Qalam Muntaha, "Penggunaan Media Berbasis AutoPlay Media Studio 8 Untuk Meningkatkan Aktivitas Dan Hasil Belajar Siswa:Sebuah Inovasi Media Pembelajaran," *Proceeding Biology Education Conference* 15, no. 1 (2018): 395.

<sup>26</sup> Norma Dewi Shalikhah, Ardhin Primadewi, and Muis Sad Iman, "Media Pembelajaran Interaktif Lectora Inspire Sebagai Inovasi Pembelajaran," *WARTA LPM* 20, no. 1 (2017): 10.

<sup>27</sup> Astrit Apriliani, "Motivasi Belajar Siswa Pada Pembelajaran Bahasa Indonesia Di Kelas IV SDN 1 Mlinjon Kecamatan Suruh Kabupaten Trenggalek Tahun Pelajaran 2018/2019," *Jurnal Pena SD* 5, no. 1 (2019): 8–12.

<sup>28</sup> Observation, January 31, 2023.

<sup>29</sup> Masruroh Mahmudah, "Urgensi Diantara Dualisme Metode Pembelajaran Ceramah Dalam Kegiatan Belajar Mengajar Untuk Siswa MI/ SD," *Cakrawala* XI, no. 1 (2016): 116–29.

<sup>30</sup> Muhammad Richsan Yamin and Karmila, "Analisis Kebutuhan Pengembangan Media Pembelajaran Berbasis Cartoon Dalam Pembelajaran IPA Pada Materi Lingkungan Kelas III SD," *Jurnal Biology Teaching and Learning* 2, no. 2 (2019): 165.

<sup>31</sup> Student Interview, January 31, 2023.

<sup>32</sup> Melani Kartika Sari, "Sosialisasi Tentang Pencegahan Covid-19 Di Kalangan Siswa Sekolah Dasar Di SD Minggiran 2 Kecamatan Papar Kabupaten Kediri," *Jurnal Karya Abdi* 4, no. 1 (2020): 80.

<sup>33</sup> Irnin Agustina Dwi Astuti and Ria Asep Sumarni, "Pengembangan Media Pembelajaran Berbasis Android Dengan Menggunakan Aplikasi Applypie Di SMK Bina Mandiri Depok," *Jurnal Pengabdian Kepada Masyarakat* 24, no. 2 (2018): 696.



supported by research by Novia Lestari and Rini Wirasty that the presentation of still simple learning is due to limited adaptation to technological developments and needs help in determining appropriate and effective learning media.<sup>34</sup>

Based on field facts, learning media used in learning tends to be simple. Class V teachers in learning science use student books by the curriculum and companion books. In addition, teachers also use PowerPoint media and videos sourced from other people's YouTube channels as supporting media during learning.<sup>35</sup> The YouTube application is the teacher's choice because it can explore various videos easily with only a phone.

The implementation of technology that is familiar in everyday life is phones. Phones are currently inseparable in everyday life, from children to teenagers to adults.<sup>36</sup> Similarly, elementary school students in the digital era are proficient in cell phones. However, its use needs to be done properly. Students prefer to play games rather than looking for learning information, so student concentration tends to decrease.<sup>37</sup> Observing these conditions, researchers want to create solutions to create interesting technology-based learning.

Given the increasingly advanced technological developments, researchers want to facilitate potential users in digital-based concrete learning to be more adaptive to technology.

Therefore, researchers took the initiative to make technology-based print learning media innovations in the form of Science modules based on Augmented Reality (AR) technology. Print media was chosen because it has several advantages, such as presenting information to readers,<sup>38</sup> and is often used by teachers as the main teaching material<sup>39</sup> in learning. However, the continuous use of printed media will make students bored.

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<sup>34</sup> Novia Lestari and Rini Wirasty B, "Pemanfaatan Multimedia Dalam Media Pembelajaran Interaktif Untuk Meningkatkan Minat Belajar Siswa," *Amaliah: Jurnal Pengabdian Kepada Masyarakat* 3, no. 2 (2019): 349.

<sup>35</sup> Theacher Interview, January 31, 2023.

<sup>36</sup> Riri Oktarini, "Pengaruh Harga Dan Citra Merek Terhadap Keputusan Pembelian Handphone Merek Xiaomi Di Kota Tangerang," *Jurnal Pemasaran Kompetitif* 3, no. 3 (2020): 52–58.

<sup>37</sup> Fitri Handayani et al., "Pengaruh Penggunaan Media Sosial Terhadap Perkembangan Anak Usia Sekolah Dasar," *Jurnal Pendidikan Tambusari* 6, no. 2 (2022): 11362–69.

<sup>38</sup> Santika Dyiah Pramesti, "Analisis Materi Dan Buku Teks Matematika Sebagai Sumber Belajar Matematika," *Elta: Jurnal Ilmiah Pendidikan Matematika* 5, no. 1 (2017): 25.

<sup>39</sup> Firdaus Su'udiah, I Nyoman Sudana Degeng, and Dedi Kuswandi, "Pengembangan Abauku Ataeks Tematik Berbasis Kontekstual," *Jurnal Pendidikan: Teori Penelitian Dan Pengembangan* 1, no. 9 (2016): 1744.

Therefore, the researchers made a module with a full-color design. In addition, the module is equipped with Augmented Reality images and markers that will produce 3D objects. The module was also chosen because elementary school has its module.<sup>40</sup> In addition, researchers want to provide facilities for students to learn independently with this module.

Researchers chose Augmented Reality (AR) technology because all students and class teachers know nothing.<sup>41</sup> In addition, researchers also want to provide new insights and experiences in learning. The utilization of AR can combine virtual and real-world objects. The objects listed on the module will be marked as markers, which will later be visualized through the AR Camera feature to bring up 3D objects on the phone screen.<sup>42</sup> Augmented reality technology can present virtual objects in the real world to produce fun and interactive media for students.<sup>43</sup> In addition, researchers also present video features in the module because children tend to like it, and make it easier for students to remember the material. This is also by the results of teacher interviews stating that students are very happy when learning with videos.<sup>44</sup>

Researchers chose technology-based print media because print media is one of the developments of visual-based learning media, which can channel information through the sense of sight. In addition, graphic media also includes the development of visual media, where graphic media can be in images, photos, charts, etc., and print media can be in the form of OHT books and modules. The module is a learning needs program that includes learning objectives, teaching materials, learning methods, tools, learning resources, and evaluation.

The characteristics of the module include (1) self-instructional, which means the module can make students learn independently. (2) self-contained, which means the material's content; (3) stand-alone, which means the module can be used without relying on other media. (4) adaptive means that the module must be adapted to technology

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<sup>40</sup> Teacher Interview, January 31, 2023.

<sup>41</sup> Teacher and Student Interview, January 31, 2023.

<sup>42</sup> Susanna Dwi Yulianti Kusuma, "Perancangan Aplikasi Augmented Reality Pembelajaran Tata Surya Dengan Menggunakan Marker Based Tracking," *Jurnal Informatika Universitas Pamulang* 3, no. 1 (2018): 36.

<sup>43</sup> Ilmawan Mustaqim, "Pemanfaatan Augmented Reality Sebagai Media Pembelajaran," *Jurnal Pendidikan Teknologi Dan Kejuruan* 13, no. 2 (2016): 182.

<sup>44</sup> Teacher Interview, January 31, 2023.

development. (5) user-friendly, which means the module is easy to use by students.<sup>45</sup> The following is a product manufacturing design:

### AR Module Cover Sample

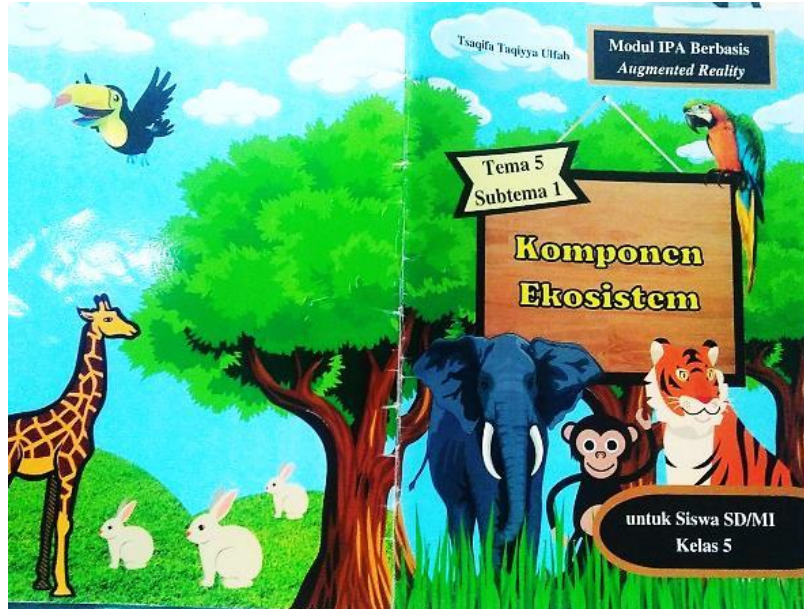


Figure 1.  
Module Cover

### AR Object Creation Plan

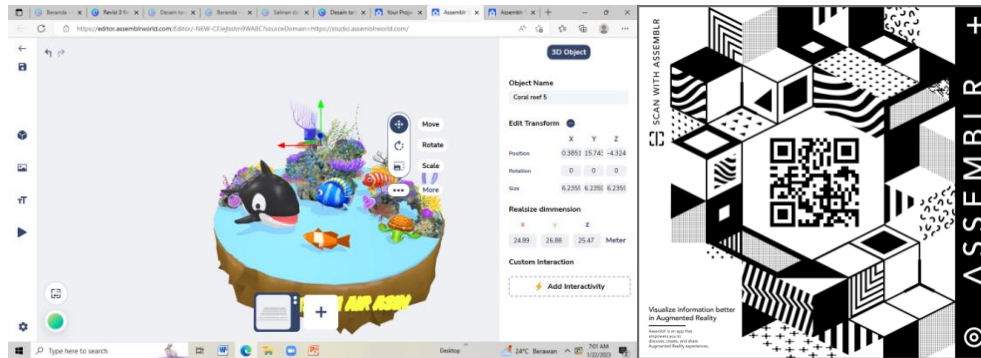


Figure 2  
The Process Of Making Ar-Based 3D Objects

### AR Object Sample

<sup>45</sup> Sukiman, "Pengembangan Media Pembelajaran" (Yogyakarta: PEDAGOGIA, 2012), hlm. 132.



Figure 3.

The result of AR-Based 3D Object Creation

Sample of How to Use AR Technology in Modules

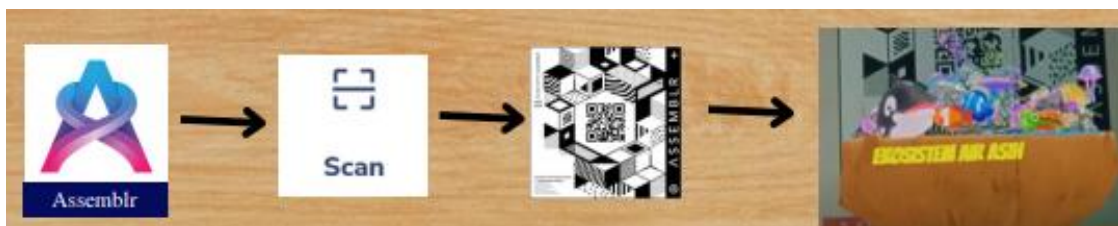


Figure 4.

How to Realize Virtual Objects With AR Technology

Sample Video Features in Module



Figure 5.

How to Open Videos in The Module

The material selection in this module focuses on science subjects on ecosystem material. Elementary school students tend to be happier when learning things related to nature because the material that students learn can be seen directly so that concrete learning can be created.<sup>46</sup> The material specifications taken are the components of the ecosystem. The material was chosen because it tends to be close to the surrounding environment, so students can more easily understand it.<sup>47</sup> However, not all ecosystem materials, such as desert ecosystems, marine ecosystems, tundra ecosystems, and others, can be seen directly at school. Therefore, researchers include 3D objects and videos in

<sup>46</sup> Hardini and Akmal, “Penerapan Metode Snowball Throwing Berbantuan Media Konkret Untuk Meningkatkan Keaktifan Dan Hasil Belajar IPA Siswa Kelas IV Sekolah Dasar,” hlm. 237.

<sup>47</sup> Teacher Interview, January 31, 2023.

the module so that they can be realized in the real world in real-time so that students can see digital objects directly. The choice of product type, material, and technology is the key to novelty in this research.

## CONCLUSION

Based on the research results, it can be concluded that a needs analysis has been obtained from the field. The needs analysis from the teacher's point of view states that the school still needs to have a self-made module, learning methods are less varied, learning media often used are textbooks, PPT, and videos sourced from YouTube, and teachers are unfamiliar with AR technology. At the same time, the needs analysis from the student's point of view states that students today cannot be separated by gadgets and are already proficient in using the phone. Students love science subjects, but the lack of variety of methods results in bored students, happy with colorful learning media such as images and videos, and lack of familiarity with Augmented Reality technology among students. Therefore, researchers want to plan the creation of AR-based media to provide learning solutions so that it can run effectively and efficiently.


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## DECLARATION OF CONFLICTING INTERESTS

I don't want any conflicts regarding research, authorship, and publication of articles.

## ORCID iD

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## REFERENCES

- Abdussamad, H Zuchri. *Metode Penelitian Kualitatif*. Makassar: Syakir Media Press, 2021.
- Apriliani, Astrit. "Motivasi Belajar Siswa Pada Pembelajaran Bahasa Indonesia Di Kelas IV SDN 1 Mlinjon Kecamatan Suruh Kabupaten Trenggalek Tahun Pelajaran 2018/2019." *Jurnal Pena SD* 5, no. 1 (2019): 8–12.

- Arifudin, Opan, Eka Setiawati, Dewi Nur Chasanah, Novita Maulidya Jalal, Minhatul Maarif, Reni Suwenti, Dewi Puspitasari, et al. *Media Pembelajaran Pendidikan Anak Usia Dini*. Penerbit Widina, 2021.
- Astuti, Irnin Agustina Dwi, and Ria Asep Sumarni. “Pengembangan Media Pembelajaran Berbasis Android Dengan Menggunakan Aplikasi Applypie Di SMK Bina Mandiri Depok.” *Jurnal Pengabdian Kepada Masyarakat* 24, no. 2 (2018): 695–701.
- Bahri, Arsad, Wahyu Hidayat, and Abdul Qalam Muntaha. “Penggunaan Media Berbasis AutoPlay Media Studio 8 Untuk Meningkatkan Aktivitas Dan Hasil Belajar Siswa:Sebuah Inovasi Media Pembelajaran.” *Proceeding Biology Education Conference* 15, no. 1 (2018): 394–401.
- Fatimah, Febriani Nur, and Supriyono. “Penggunaan Media Benda Konkret Pada Tema Lingkungan Untuk Peningkatan Hasil Belajar Siswa Di Sekolah Dasar.” *JPGSD* 1, no. 2 (2013): 1–7.
- Firmandani, Fifit. “Media Pembelajaran Berbasis Teknologi Sebagai Inovasi Pembelajaran Era Revolusi Industri 4.0.” *Prosiding Konferensi Pendidikan Nasional* 2, no. 1 (2020): 93–97.
- Habib, Ahmad, I Made Astra, and Erry Utomo. “Media Pembelajaran Abad 21: Kebutuhan Multimedia Interaktif Bagi Guru Dan Siswa Sekolah Dasar.” *JARTIKA: Jurnal Riset Teknologi Dan Inovasi Pendidikan* 3, no. 1 (2020): 25–35.
- Hamid, Musstofa Abi, Rahmi Ramadhani, Masrul, Muhammad Munsarif, Jamaludin, and Janner Simarmata. *Media Pembelajaran*. Medan: Yayasan Kita Menulis, 2020.
- Handayani, Fitri, Riqqah Annisa Maharani, Desyandri, and Indramurni. “Pengaruh Penggunaan Media Sosial Terhadap Perkembangan Anak Usia Sekolah Dasar.” *Jurnal Pendidikan Tambusari* 6, no. 2 (2022): 11362–69.
- Hardini, Agustina Tyas Asri Hardini, and Arlita Akmal. “Penerapan Metode Snowball Throwing Berbantuan Media Konkret Untuk Meningkatkan Keaktifan Dan Hasil Belajar IPA Siswa Kelas IV Sekolah Dasar.” *Jurnal Pendidikan Dasar PerKhasa* 3, no. 1 (2017): 223–45.
- Hartanti, Dwi. “Meningkatkan Motivasi Belajar Siswa Dengan Media Pembelajaran Interaktif Game Kahoot Berbasis Hypermedia.” *Prosiding Seminar Nasional: Kebijakan Dan Pengembangan Pendidikan Di Era Revolusi Industri 4.0*, 2019, 78–85.
- Hasan, Muhammad, Darajat Milawati, Tuti Khairani Harahap, Tasdin Tahrir, Ahmad Mufit Anwari, Azwari Rahmat, Masdiana, and I Made Indra. *Media Pembelajaran*. Tahta Media Group, 2021.
- Hendriyani, Yeka, Niswardi Jalinus, Vera Irma Delianti, and Lativa Mursyida. “Analisis Kebutuhan Pengembangan Media Pembelajaran Berbasis Video Tutorial.” *JTIP: Jurnal Teknologi Informasi Dan Pendidikan* 11, no. 2 (2018): 85–88.
- Jundu, Ricardus, Emilianus Jehadus, Fransiskus Nendi, Yohanes Kurniawan, and Fulgensius E Men. “Optimalisasi Media Pembelajaran Interaktif Dalam Meningkatkan Kemampuan Matematis Anak Di Desa Popo Kabupaten

- Manggarai.” *E-DIMAS: Jurnal Pengabdian Kepada Masyarakat* 10, no. 2 (2019): 221–25.
- Kanti, Luthviana, Shaniyah F Rahayu, Erfan Aprianna, and Ernita Susanti. “Analisis Pengembangan Media Pembelajaran Berbasis Augmented Reality Dengan Model POE2WE Pada Materi Teori Kinetik Gas Literature Review.” *Jurnal Pendidikan Dan Ilmu Fisika* 2, no. 1 (2022): 75–82.
- Kusuma, Susanna Dwi Yulianti. “Perancangan Aplikasi Augmented Reality Pembelajaran Tata Surya Dengan Menggunakan Marker Based Tracking.” *Jurnal Informatika Universitas Pamulang* 3, no. 1 (2018): 33–38.
- Laily, Nur, and Wahyu Sukartiningsih. “Pengembangan Media Pembelajaran Interaktif Berbasis Flash Untuk Pembelajaran Keterampilan Menuliskan Kembali Cerita Siswa Kelas IV SD.” *JPGSD* 6, no. 7 (2018): 1150–59.
- Lestari, Novia, and Rini Wirasty B. “Pemanfaatan Multimedia Dalam Media Pembelajaran Interaktif Untuk Meningkatkan Minat Belajar Siswa.” *Amaliah: Jurnal Pengabdian Kepada Masyarakat* 3, no. 2 (2019): 349–53.
- Lubis, Isma Ramadhani, and Jaslin Ikhsan. “Pengembangan Media Pembelajaran Kimia Berbasis Android Untuk Meningkatkan Motivasi Belajar Dan Prestasi Kognitif Peserta Didik SMA.” *Jurnal Inovasi Pendidikan IPA* 1, no. 2 (2015): 191–201.
- Mahmudah, Masruroh. “Urgensi Diantara Dualisme Metode Pembelajaran Ceramah Dalam Kegiatan Belajar Mengajar Untuk Siswa MI/ SD.” *Cakrawala* XI, no. 1 (2016): 116–29.
- Mubaraq, Muhammad Rizky, Helmi Kurniawan, and Ahmad Saleh. “Implementasi Augmented Reality Pada Media Pembelajaran Buah-Buahan Berbasis Android.” *IT Journal* 6, no. 1 (2018): 89–98.
- Mustaqim, Ilmawan. “Pemanfaatan Augmented Reality Sebagai Media Pembelajaran.” *Jurnal Pendidikan Teknologi Dan Kejuruan* 13, no. 2 (2016): 174–83.
- Oktarini, Riri. “Pengaruh Harga Dan Citra Merek Terhadap Keputusan Pembelian Handphone Merek Xiaomi Di Kota Tangerang.” *Jurnal Pemasaran Kompetitif* 3, no. 3 (2020): 52–58.
- Pramesti, Santika Dyiah. “Analisis Materi Dan Buku Teks Matematika Sebagai Sumber Belajar Matematika.” *Elta: Jurnal Ilmiah Pendidikan Matematika* 5, no. 1 (2017): 25–32.
- Purnomo, Puji, and Maria Sekar Palupi. “Pengembangan Tes Hasil Belajar Matematika Materi Menyelesaikan Masalah Yang Berkaitan Dengan Waktu, Jarak Dan Kecepatan Untuk Siswa Kelas V.” *Jurnal Penelitian (Edisi Khusus PGSD)* 20, no. 2 (2016): 151–57.
- Putri, Amirah Z Hermawan, Setya C Wibawa, and Amalia Ruhana. “Pengembangan Aplikasi Pembelajaran Bumbu Dan Rempah Berbasis Augmented Reality Bernama ‘WORD OF HERBS AND SPICES.’” *Jurnal Bosaparis: Pendidikan Kesejahteraan Keluarga* 12, no. 2 (2021): 70–80.
- Rosaliza, Mita. “Wawancara, Sebuah Interaksi Komunikasi Dalam Penelitian Kualitatif.” *Jurnal Ilmu Budaya* 11, no. 2 (2015): 71–79.

- Salsabila, Unik Hanifah, Rizka Maulina Saputri, Desi Nugrahane Nursusanti, Erwan Setianto, and Harun Sabhara. “Kedudukan Teknologi Pendidikan Islam Di Era Globalisasi.” *NUSANTARA: Jurnal Pendidikan Dan Ilmu Sosial* 3, no. 3 (2021): 402–16.
- Sari, Melani Kartika. “Sosialisasi Tentang Pencegahan Covid-19 Di Kalangan Siswa Sekolah Dasar Di SD Minggiran 2 Kecamatan Papar Kabupaten Kediri.” *Jurnal Karya Abdi* 4, no. 1 (2020): 80–83.
- Sarwono, Jonathan. *Metode Penelitian Kuantitatif & Kualitatif*. Yogyakarta: Graha Ilmu, 2006.
- Shalikhah, Norma Dewi, Ardhin Primadewi, and Muis Sad Iman. “Media Pembelajaran Interaktif Lectora Inspire Sebagai Inovasi Pembelajaran.” *WARTA LPM* 20, no. 1 (2017): 9–16.
- Su’udiah, Firdaus, I Nyoman Sudana Degeng, and Dedi Kuswandi. “Pengembangan Abauku Ataeks Tematik Berbasis Kontekstual.” *Jurnal Pendidikan: Teori Penelitian Dan Pengembangan* 1, no. 9 (2016): 1744–48.
- Syahroni, Mashud, Firstya Evi Dianastiti, and Fifit Firmadani. “Pelatihan Media Pembelajaran Berbasis Teknologi Informasi Untuk Meningkatkan Keterampilan Guru Dalam Pembelajaran Jarak Jauh.” *International Journal of Community Service Learning* 4, no. 3 (2020): 170–78.
- Ulfah, Tsaqifa Taqiyya, and Aninditya Sri Nugraheni. “Pemahaman Fonetik Siswa Sekolah Dasar Terhadap Teknik Membaca Suara.” *Medan Makna: Jurnal Ilmu Kebahasaan Dan Kesastraan* 18, no. 2 (2020): 201–11.
- Widiara, I Ketut. “Blended Learning Sebagai Alternatif Pembelajaran Di Era Digital.” *PURWADITA* 2, no. 2 (2018): 50–56.
- Wirayasa, I Dewa Gede Putr, I Putu Darmayasa, and I Made Satyawan. “Pengembangan Instrumen Penilaian Hasil Belajar Ranah Kognitif Model 4D Pada Materi Sepak Bola Berdasarkan Kurikulum 2013.” *Jurnsl Pendidikan Jasmani Olahraga Dn Kesehatan* 8, no. 3 (2020): 81–88.
- Yamin, Muhammad Richsan, and Karmila. “Analisis Kebutuhan Pengembangan Media Pembelajaran Berbasis Cartoon Dalam Pembelajaran IPA Pada Materi Lingkungan Kelas III SD.” *Jurnal Biology Teaching and Learning* 2, no. 2 (2019): 159–70.