Developing Arabic Media Based on Brain-Based Learning: Improving *Mufrodat* in School

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Abstract: Education in the era of transformation affects the development of science and technology since teachers are directed to be innovative in language teaching. This study aimed to develop Arabic language media based on brain-based learning for SMK (Vocational High School) Muhammadiyah 3 Yogyakarta during the Covid-19 period. This study employed Research and Development (R and D) method with the development model proposed by Borg and Gall. The research subjects consisted of ten students and three teachers. Research data were collected through interviews, observation, and documentation techniques. The researchers implemented the data analysis technique by Miles and Huberman. Furthermore, the researchers ensure the data validity by triangulation. The analysis indicated that the Arabic language media was feasible to be used. The validity had been tested by two material experts and two media experts. Material expert 1 gave an average score of 4.27, and material expert 2 gave an average score of 4.81, both within the high category. On the other hand, media expert 1 gave an average score of 4.42, and media expert 2 gave an average score of 3.71, both within the high category. Also, the product had been tested on ten students during the small-scale trial and the large-scale trial. According to material experts' validation, the weakness of the product was related to the title of the material and the duration. Therefore, the developed media could increase *mufrodat* mastery in the industrial 4.0 era.

INTRODUCTION

School is a formal education that aims at creating human beings who are knowledgeable, creative, and have character (Badra, 2021). Parents need schools to guide students to achieve their goals as knowledgeable human beings. In today's reality, the quality of Arabic language education has not been achieved optimally (Das, 2021). Arabic language education in schools is still limited to the knowledge that must be obtained by students but has not yet achieved its real goal, namely Islamic values and daily-life application. The results of Arabic language teaching are measured by scores and students' *mufrodat* mastery (Thierry, 2020). Mufrodat is the most important part of teaching Arabic. In particular, at SMK in Yogyakarta, students could not memorize and understand Arabic *mufrodat*.

Arabic is a foreign language learning that is difficult to learn (Tjahjani & Jinanto, 2021). Difficulties that hinder students' language learning process include differences in phonology or sound, writing systems, word forms, and sentence structure (Al Zumor, 2019). Students assume that Arabic subjects are

difficult and complicated lessons (Xuan et al., 2020), although each language has its characteristics and levels of difficulty and convenience. Internal factors (factors from within a person) and external factors (factors from outside of a person) are factors that influence a person in learning Arabic (DMM Sari & Prasetyo, 2021). Interests, talents, and motivation are included in internal factors or factors from within students (Huneety et al., 2020). External factors include teachers, curriculum, syllabus, teaching materials, learning models, strategies, media, and evaluation (Taufiqurrochman et al., 2021). An adequate mufrodat mastery is needed to help students learn Arabic (Asia et al., 2021). Experts state that *mufrodat* is a requirement to be mastered (Thiele, 2016). Mufrodat is also a lesson that can greatly help students write, speak, and even communicate in Arabic. Therefore, it can be said that *mufrodat* is an element of language that must be possessed by learning Arabic (Akzam et al., 2021).

The main problem in this study is the students' lack of ability in reciting the Qur'an and understanding or memorizing *mufrodat (Intervi*ew, 2021). Students could not learn Arabic or the mufrodat order because the learning adopts a teacher-centered approach. Learning Arabic at SMK Muhammadiyah 3 Yogyakarta did not apply appropriate Arabic learning media (Siswa, 2021).

So far, the alternative offered to the world of education in schools is module-based learning (CS Sari, 2019). The alternative can be the development of a media-based curriculum in Arabic language learning. Academically, on the research base, researchers and academics have studied and developed Arabic language learning, even Arabic learning media (Asiah et al., 2021; Wargadinata et al., 2020). However, descriptively, few have raised research on the brain-based learning approach, which is learning Arabic by increasing students' brain concentration (Khalil et al., 2019). Brain-

based learning is expected to help students understand Arabic learning (Wahdan et al., 2020).

So far, research on Arabic has broad implications for curriculum development and the development of Arabic language materials. Stepan conducted relevant research on the development of brain theory on linguistics understanding (Booth, 2021). It was followed by Hilmi's research, which explains the use of neurolinguistics to develop Arabic grammatical methods (Hilmi, 2020). Novyanti conducted subsequent research regarding the development of HOTS-based learning in vocational high schools (Novyanti et al., 2021).

This research is different from previous research because this research developed Arabic learning media based on brain-based learning for improving students' *mufrodat* ability. The researchers focused on developing Arabic learning media with a brain-based approach.

This research aims to develop an Arabic learning media based on brain-based learning to help students understand *mufrodat* material. Arabic learning is related to *maharah qiro'ah*, *kitabah, istima'*, and *kalam*. Arabic learning media based on brain-based learning is a medium that utilizes five brain learning systems, namely emotional, social, cognitive, physical, and reflective. It also provides a balanced portion of the five learning systems without favoring one system (Triana et al., 2019). Learning media with a brain-based learning approach responds to the forebrain (prefrontal cortex) to synchronize between the brain and language (Koşar & Bedir, 2018; Nikitina, 2021; Noureen et al., 2017). The *mufrodat* material in the media is easy to understand. The learning is focused on mufrodat as a memorization exercise and practice at school and home (Jamal Giaber and Hala Sharkas, 2021; Zayed & Razeq, 2021).

This research is based on the argument that students cannot understand

mufrodat material. Teachers at SMK Muhammadiyah 3 Yogyakarta have not been innovative in delivering material to students. The learning implemented is the teacher-centered technique. The learning media developed so far is module-based learning and student worksheets. The teachers delivered the material using PowerPoint presentations supported by a projector. Based on the preliminary study, students need audio-visual learning media based on brain-based learning *(Interview, 2021)*. Brain-based learning media in Arabic learning are audio-visual media. It is a media packaged with interesting, fun, and easy audio-visuals. The media is fun for students in memorizing the *mufrodat*, and it is hoped that students can converse in Arabic.

THEORETICAL SUPPORT

According to Jensen, brain-based learning is a model that considers how the brain learns optimally (Ritonga et al., 2021). The optimization is meant not by forcing the brain to accept as much learning as possible but by letting the brain learn and work according to its rhythm (Akmaliyah et al., 2021). The theory is in line with Duman's opinion that brain-based learning is student-centered learning that uses all parts of the brain and recognizes that not all students learn the same way (Alwishah, 2016). Brain-based learning is also an active process where students play an active role in building their knowledge of various learning situations (Alhirtani, 2019).

The brain-based learning approach is a learning concept that utilizes a single unit of the five natural learning systems of the brain, namely social, emotion, cognition, physical, and reflection. It provides a balanced portion of the five learning systems without favoring any one system (Bonomo Ed. D., 2017). The definition implies that this approach aims to develop the five natural learning systems of the brain to the maximum (Widodo, 2019). The five learning systems are emotional, social, cognitive, physical, and reflective. The five learning systems influence each other and cannot stand alone (Belkacem & Lakas, 2021).

The developed Arabic learning media proves that all knowledge transfer performance is influenced by the right and left brains (Hustad et al., 2021). However, the development of Arabic language media is instrumental and always leads to one direction of learning, and is dominant to the use of the left brain (Pereira Soares et al., 2021).

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Figure 1. Brain-Based Arabic Learning Media

Arabic learning media based on brain-based learning is implemented through videos and audio that attract students' attention and motivation (Huettig et al., 2018). The media is assisted by approaching the students' right

and left brain functions. Brain-based learning media in Arabic learning maximizes the intelligence function of the forebrain called the prefrontal cortex, as focus and concentration on Arabic material (Fritz & Baggio, 2021). It is a learning media that increases learning concentration on *mufrodat* material (He et al., 2021). Figure 1 is an example of an Arabic language learning media based on brain-based learning. The material presented to students is a *mufrodat* chapter on family (*al-a'ilah*). The audio-visual media was conceptualized as attractive as possible with images, cartoons, and instructions to help students understand *mufrodat*.

METHOD

This type of research is research and development. Research and development is a research method used to produce certain products and test the effectiveness of the products (Sugiyono, 2017). The research and development procedure followed the stages presented by Borg and Gall in Setyowati (Setyowati, 2015). The subjects of this study were ten students and three teachers selected by the purposive sampling technique. The researchers collected the data through interviews, observation, and documentation. Interviews were conducted with the ten students and three teachers. The data analysis technique followed the Miles and Huberman model. This development method followed the Borg and Goll model, but the researchers only applied five steps: (1) needs analysis, (2) design/planning, (3) development and implementation, (4) evaluation (5) revision. Due to time constraints and the Covid-19 pandemic, the researchers applied only five steps. It was difficult to interview students and teachers since the school applied the online learning system. Therefore, the researchers decided to perform this study up to the fifth step.
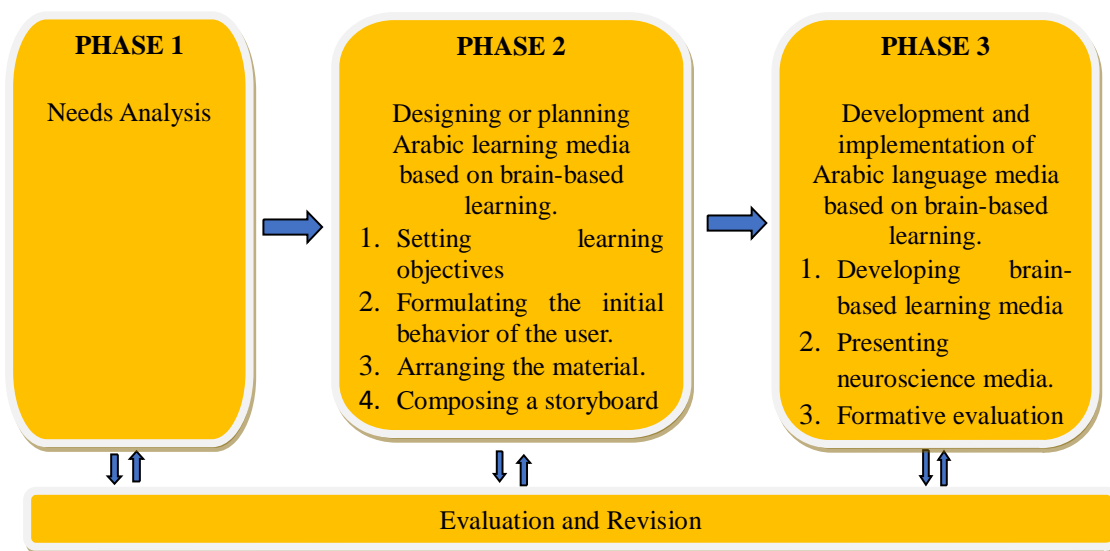
Figure 2. The Modified Development Stages

Preliminary Research and Information Gathering

At this initial stage, the researchers identified problems and obtained information about the problems encountered in the learning process at SMK Muhammadiyah 3 Yogyakarta. The researchers also investigated and analyzed teacher and student perceptions of Arabic-learning media based on brain-based learning and analyzed the needs of teachers and students for brain-based Arabic learning media.

Planning

The researchers planned the initial draft and then discussed it with practitioners and experts. Next, the researchers decided on the setting of learning objectives. The initial design of teaching materials was based on the specifications obtained through needs analysis, interviews, observations, and questionnaires distributed to teachers and students.

Initial Product Format Development

The initial product design preparation was carried out in this third stage based on the planning results. The Arabic learning media produced in this research and development was audio-visual media based on brain-based learning following the needs analysis. In this stage, the researcher collected information and data related to product development. The product that students and teachers agreed on was a brain-based Arabic learning media packaged with videos, clear images, and sounds. The animation and pictures are closer to the emotional and reflective approach of the brain.

Initial Trial

The initial trial was expert validations on the content and initial product design. The validation was carried out by material, media, and language expert lecturers Expert validation results were used to improve the initial product design. The validation score provided by media experts was 3.80 in the high category. The validation score given by the material expert was 5.0 in the high category. The trials on ten students in the small-scale and large-scale trials obtained the high category.

Research data was collected through observation to obtain data on the objective conditions of the Arabic learning process at SMK Muhammadiyah 3 Yogyakarta. A questionnaire was used to obtain data on the needs analysis of Arabic learning media based on brain-based learning, objective conditions, analysis of media indicators, and the feasibility of learning media. The interviews collected data by asking questions directly to Arabic language teachers and students to obtain data on students' characteristics, materials, and curriculum. Documentation was performed to obtain data related to research objects and activities in the Arabic learning process in terms of objectives, indicators, materials, methods, media, and evaluations.

Data analysis and processing techniques were qualitative analysis and quantitative analysis. Using a close-ended questionnaire with a Likert scale, the data was analyzed using a rating scale measurement. Furthermore, the interview, observation, and documentation data were analyzed through data reduction, display, and verification.

RESULT AND DISCUSSION

Based on the formulation of the problem and research methods, the research produced data findings relevant to learning Arabic at SMK Muhammadiyah 3 Yogyakarta.

Needs Analysis

The observation results showed that most students choose audio-visual Arabic learning media based on brain-based learning. From ten students who filled out the questionnaire, all ten students chose brain-based Arabic learning media. The teaching and learning process during the Covid-19 pandemic was done offline or online using books or Arabic learning modules. The teachers and students at SMK Muhammadiyah 3 Yogyakarta have not implemented brain-based Arabic learning media.

Questionnaire data revealed that students choose audio-visual-based Arabic learning media. They prefer the learning media compared to modules. The reason was that Arabic learning media is

easier to understand and simple to practice at school and home.

The result of an interview with students is as follows:

"*Researchers: How was the class learning so far? Do you understand what the teacher says?*

*Students: We understand, sir. However, some of our friends still do not understand the Arabic reading material and mufrodat presented by the teacher. Most of them do not understand because the material is difficult to understand. Moreover, the teachers have not been innovative in teaching. Students are more directed to read, write, and listen to teachers' explanation*s (Students, 2021).

Some of the information from the students above proved that ten students in class X TKJ 1 chose the learning media compared to the textbook. Thus, the assumption of this research was very strong to develop brain-based Arabic learning media.

The results of an interview with one of the teachers at SMK Muhammadiyah 3 Yogyakarta are as follows:

"*Most of the students at SMK Muhammadiyah 3 Yogyakarta come from public schools (State Junior High School). About learning Arabic, so far, there have been variations. There are students who are already proficient in Arabic. However,*
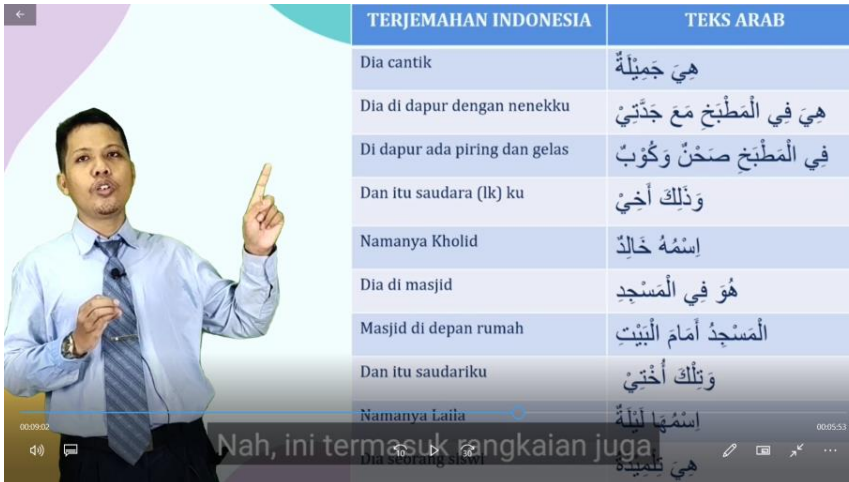
some are unable to read and write Arabic. Students can memorize and practice with their friends'' (Teacher, 2021).

Based on the interview with the Arabic teacher, students experienced boredom and ultimately did not understand the material conveyed by the teacher.

Design

Based on the needs analysis, the development of Arabic learning media was carried out to increase students' lack of interest and learning outcomes in Arabic. The brain-based learning sourced from guidebooks or Arabic learning modules was modified to be more interesting and equipped with pictures, audio, video, and evaluation. The media was packed with interesting audio-visuals. It supported *mufrodat*, *quwaidul arobiyah*, and *muhadasah* materials are easier for students to learn.

This learning media contains *mufrodat* material sourced from guidebooks or Arabic learning modules. Each chapter contains mufrodat material and *quwaidul arobiyah*. The following is the description of the brain-based Arabic learning media.

Figure 3. *Mufrodat* Material

The media is equipped with attractive images, sounds, and colors to attract students' attention, motivate

students to learn Arabic, and make it easier for them to memorize *mufrodat* and practice *muhadasah* based on the right

and left brain approaches. The learning media is assisted by teacher direction, assistance, and motivation. Also, the Arabic learning media provides examples of the *mufrodat* in sentences contained in videos so that students do not feel bored in memorizing the mufrodat. The media contains questions presented simply to evaluate the learning. The evaluation is divided into two: choosing the correct answer and matching the picture with the writing. The evaluation is also equipped with timer and direct scoring to increase students' interest, emotional, affective, cognitive, and psychomotor abilities in memorizing *mufrodat* and practicing *muhadasah.*

Arabic Learning Media Based on Brain-Based Learning

The validation process involved two material experts and two media experts from the postgraduate program of Islamic Education, Ahmad Dahlan University, Yogyakarta. The material validation instrument contained ten assessment indicators, namely equivalence, subject matter, ease of learning, sharpness of lessons, the accuracy of terms, sequence of pictures and illustrations, suitability of material with Arabic language development, interactive presentation, creating the ability to ask questions, encouraging students to learn independently, and evaluation. Each item contains a minimum score of 1 and a maximum score of 5.

Table 1. Material Validation Result

Validator	Maximum Score	Rating Result	Average
1	22	25	4.27
2	8	45	4.81
Category			High

The two material experts gave Arabic language media based on brain-based learning a high predicate. However, there were some inputs or suggestions given by validators or material experts to improve the teaching media. The experts suggested the researchers add examples of the usage of *mufrodat* in sentences and shorten the duration.

In the media validation instrument, there were eight assessment indicators, namely (1) a simple display; (2) an attractive display; (3) easy to read and has good contrast; (4) navigation buttons work well: (5) audio operates well; (6) easy-to-use application; (7) the application can be used without any problems; (8) the application does not contain errors. Each item statement has the lowest score of 1 and the highest score of 5.

Table 2. Media Validation Result

Validator	Maximum Value	Rating Result	Average
1	16	15	4.42
2	6	20	3.71
Category			High

The results state that the Arabic learning media with brain-based learning has feasible criteria with an average score of 4.42 from media experts 1 and 3.71 from media expert 2. However, there were some inputs and suggestions from validators or media experts to optimize the media. The experts suggested improving the audio-visual related images that were less attractive. However, the researchers responded well to the inputs and notes from the media experts.

Development and Implementation

After going through the needs analysis phase and the design phase, the

researchers then carried out development and implementation with three trial stages, including (1) a one-to-one (individual) trial on three students; (2) a small-scale trial on five students; and (3) a field trial (large-scale) on ten students. The trials were conducted to obtain students' responses to brain-based Arabic learning media.

The field trial instrument contained ten indicators, namely (1) the learning media has an attractive display; (2) This learning media increases my motivation in learning Arabic; (3) the learning media make learning Arabic less boring; (4) this media makes it easier for me to memorize *mufrodat*; (5) the illustrations and videos make it easier for me to memorize mufrodat; (6) the media displays material that is easy to understand; (7) the media contains evaluation to test *mufrodat*; (8) the media has example sentences that can help me memorize *mufrodat*,(9) the media uses simple and easy-to-understand language; (10) the writing is easy to read.

Test results of a one-to-one trial on three respondents obtained an average score of 3.66 or 72%. The small-group trial on nine respondents obtained an average score of 6.6 or 85%. The field trial on ten respondents obtained an average score of 3.80 or 80%. The trials results indicated that the brain-based Arabic learning media was feasible or could be used in learning Arabic.

Figure 4. Learners Learn Online in the Covid-19 Era with Brain-Based Arabic Learning Media

Figure 4 depicts a student who learns Arabic at home accompanied by one of the teachers. During the Covid-19 period, SMK Muhammadiyah 3 Yogyakarta students kept learning using the brain-based Arabic learning media. One of the benefits of this media is that it motivated students during the Covid-19 pandemic. It directed students to memorize *mufrodat* and speak Arabic. Arabic learning media based on brain-based learning helped students focus on the materials. The students' reflective brain adjusts between thought patterns and language with an emotional approach. However, several obstacles occurred during the learning. The students had difficulty accessing the internet, and there were internet signal interferences. The teacher provided several alternatives to students to help them learn Arabic during the Covid-19 period.
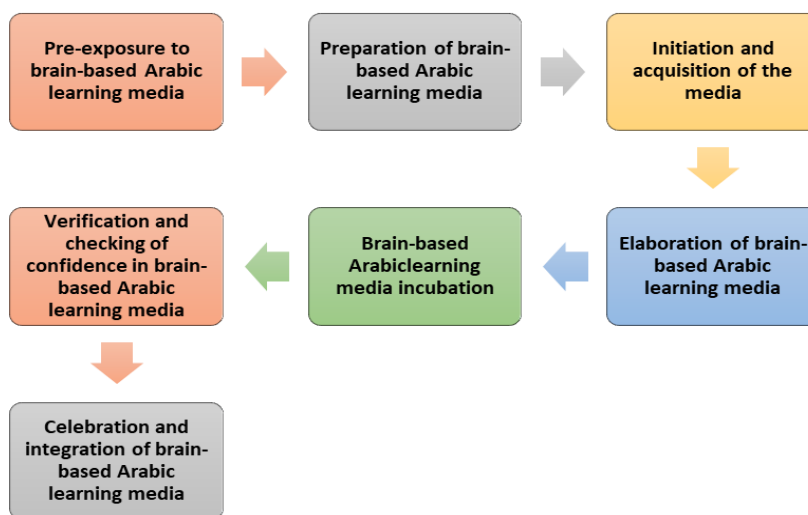
Figure 5. The Steps of the Arabic Learning Media Based on Brain-Based Learning

The first step is pre-exposure. This step introduces the brain to new learning before really digging further. Pre-exposure helps the brain build a better conceptual map. Before being operated, students are given a warm-up activity by asking about the previous material. The second step is preparation. This step stimulates students' curiosity about the *mufrodat* material. The third step is initiation and acquisition. Teachers provide projects that facilitate students to build knowledge and initial understanding of a subject matter based on their learning experiences. In the learning media, mufrodat material has been packaged in an interesting and fun way.

The fourth step is elaboration. It is the stage of information processing that requires students' pure thinking skills. Students are directed to concentrate through brain stimulation to be more focused and understand the *mufrodat* material. The fifth step is incubation. This step emphasizes the importance of rest and time to replay. Students memorize five *mufrodat* and recite them in their leisure time at school or home.

The sixth step is verification and belief checking. This step is not only for the benefit of the teacher. Learners also need to confirm their learning for themselves. The teacher identifies students who cannot read and students who can read Arabic mufrodat. Verification is used to check and evaluate each student after the brain-based learning video is operated.

The last step is celebration and integration. This phase is important to engage the students' emotions. Teachers can make this phase exciting, cheerful, and fun. The students then practice mufrodat with their peers based on the teacher's directions. The activity provides independence to students to be more active and confident.

There are three strategic designs in the brain-based learning model in Arabic, namely (1) creating a learning environment that challenges students' thinking skills. (2) creating a pleasant Arabic learning environment; and (3) creating students' active and meaningful learning situations. These three things can help students in developing reasoning abilities. A pleasant learning environment will motivate students to convey ideas about the studied material. Active learning can hone students' abilities in analyzing a problem and finding the right solution.

This learning media is an alternative for face-to-face (offline) learning and online learning. This media is very useful for students to improve their *mufrodat*. The media promotes students' active roles. Even though during the Covid-19 pandemic, the developed learning media can be operated and studied at each student's home.

CONCLUSION

Based on the findings and discussion, the developed media was considered feasible to be applied in Arabic learning activities during the Covid-19 and normal periods. Also, the brain-based Arabic learning media was considered effective in the *mufrodat* learning process. The learning media was feasible based on the validation by the material experts and the media experts. Material experts 1 provided a score of 4.27, while material experts 2 provided a score of 4.81. Furthermore, media expert 1 gave a score of 4.27, and media expert 2 gave a score of 3.27. The scores belonged to the high category. The implementation of the brain-based Arabic learning media obtained a score of 85% (individual trial), 80% (small-scale trial), and 72% (field trial). Increased interest and learning outcomes were evidenced by material validation and media validation results. The results showed the students increased ability in memorizing *mufrodat*. This research produced a product specifically

for *mufrodat* and *muhadasah* materials compared to previous research. The media was equipped with sounds, pictures, evaluations, and examples presented in videos. The contents made this product effective, efficient, and also attractive. The product can improve and facilitate students in Arabic learning, especially during the Covid-19 period.

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