# Barcode-Karten as Learning Development to Improve Vocabulary Knowledge about German Language

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## ABSTRACT

The quality education process in learning foreign languages, mainly German, must be supported by learning media. To improve vocabulary knowledge about German *Artikel* with the *Haustiere* theme needs to be supported by "*Barcode-Karten*" as the purpose of this research. Multimedia-based learning media utilizes audio, text, and images by combining barcodes, links, and tools with that students are interested in finding out, interacting, and communicating. Borg and Gall's research and development model was modified in this study. The validation and trial phases have been carried out on the development of *Barcode-Karten* media. Quantitative data in the form of assessment scores with a Likert scale and qualitative data were obtained from criticism and suggestions through questionnaires to validators and students of class XI Cross-Interest German Language at *SMA Laboratorium UM*. Data were analyzed using qualitative descriptive analysis techniques. The function of this media can bring out the desire and motivation and positively influence on students' vocabulary mastery. In addition, *Barcode-Karten* is worthy of being a learning medium to improve the knowledge of German vocabulary with the *Haustiere* theme.

*Keywords: Barcode-Karten, learning media, vocabulary, Artikel , Haustiere theme*

## 1. INTRODUCTION

Currently, foreign language subjects, mainly German, have been taught at high schools (*SMA*) and the equivalent, one of which is at *SMA Laboratorium UM*. The curriculum in several high schools has raised German as a foreign language subject [1]. German language learning is taught using a curriculum that refers to the *GER* (Gemeinsamer Europäischer Referenzrahmen) or known as the internationally applicable European standard reference frame as a basis for equality in curriculum development, textbook creation, and German language tests [1]–[3].

Based on the *GER*, mastering the German language is divided into three levels, each consisting of two sub-levels. The first level is the basic level (*Elementare Sprachverwendung*), consisting of *A1* and *A2*. They were followed by the intermediate level (*Selbständige Sprachverwendung*), *B1*, and *B2*. The highest level is (*Kompetente Sprachverwendung*) which is an advanced level of German, this level consists of *C1* and *C2* [2]. The German language learning material taught at *SMA Laboratorium UM* is the beginner or basic level, namely the material for the *A1* level.

Every language certainly has its linguistic characteristics, as well as German. In German, every Nomen (noun) has an Artikel (Artikel), namely der (masculine), die (feminine), and das (neutral)[4]. Artikel on German nouns do not have absolute unique characteristics to be easily distinguished and memorized. Meanwhile, vocabulary mastery is essential in supporting students' German language skills [1], [5], [6]. It is often a problem experienced by students in learning German, and students find it challenging to master the vocabulary of German noun Artikel.

There is a strategy to improve the mastery of Artikel by memorising the suffixes that distinguish Artikel. The Artikel on a noun can be marked based on morphological process, for examples nouns with suffixes -er, -ling and -ig are Masculine (der), nouns with suffixes -e, -ei, keit/-heit, -ion and -ung are Feminine (die) and nouns with suffixes-ment and -um are Neutral (das) [7]–[9]. Even though this memorisation strategy can help remember Artikel, the learning material for the Haustiere theme in class

XI Cross-Interests at SMA Laboratorium UM does not contain these suffixes. So students must memorise the whole word along with the Article which is certainly not easy.

Based on observations during the KPL (Internship), German language learning at SMA Laboratorium UM is taught in classes X to XII in the language department and X to XII in addition to the language department in the subjects of Cross-Interest German. For class XI students studying the new theme Familie (family) with the subtheme Haustiere (pets), remembering Artikel for every German noun takes work.

In observations made by researchers at SMA Laboratorium UM, teachers often apply learning oriented to memorizing vocabulary, and sometimes students do not understand the vocabulary. Under these circumstances, the students had difficulty remembering the German vocabulary they were learning. Using methods that are oriented towards the target vocabulary and require students to memorize will cause the vocabulary taught to be less meaningful and easy to forget [5]. It can be concluded that with this memorization learning, students will quickly forget the vocabulary they are learning. In addition, the rote method causes students to be less motivated to learn German [10].

From the researchers' observations during the KPL (Internship) , the students preferred learning that was carried out in groups and using the game method. This is because learning in the classroom feels more lively and fun. They are motivated to learn and can more easily remember the vocabulary learned, according to the statement that using learning media can help students understand the material being studied while creating a fun and exciting classroom atmosphere [11], [12].

Based on unstructured interviews with German teachers at SMA Laboratorium UM, vocabulary mastery is one of the main problems in learning German. Learning in class XI Cross-Interest German needs help with mastering Artikel on the Haustiere theme. This difficulty increases because students find it challenging to understand the pronunciation of the vocabulary they are learning, especially if it is the first time they know the word. To help overcome this problem, the researcher intends to develop media that can be an alternative to improving vocabulary mastery of German noun and Artikel and how to pronounce them.

Learning media can convey information effectively to students [13]–[15]. The existence of learning media can make it easier for students to study learning materials independently outside of the teacher's explanation. With this, students can increase their understanding and desire to learn and provide a pleasant learning atmosphere in the classroom [16]–[18]. The presence of the media can minimize the ambiguity of the learning material delivered by the teacher as an intermediary [19]. From the explanation conveyed, media can be used as a means or tool in the learning process that can help deliver the material being taught and provide a pleasant learning atmosphere.

Card game media can be a choice of media to help learn German. Research by Alanmiati proves that learning with the media card game "Spitte" can help learn German at the A1 level [20]. This "Spitte" card media research raised the theme of Kleidung and research subjects from students of the Department of German Literature, State University of Malang. In contrast to the "Spitte" card used to practice speaking skills, the researcher developed a learning media that focuses on improving the mastery of German noun Artikel.

Another study from Kariza showed that using game media as an alternative to improving German vocabulary mastery can make learning engaging, effective, and fun [21]. From observations made by researchers at SMA Laboratorium UM, students experience the same problem as Kariza's research. The researcher intends to develop a card game media with audio that is not only to practice vocabulary mastery of German noun Artikel but also to learn the pronunciation. Therefore, the researcher wants to add a barcode feature to access the audio pronunciation of vocabulary on card game media.

Research from Rosita shows that the Android-based game learning media obtained good results in increasing vocabulary mastery and motivating students to learn German [12]. With satisfactory results on this media, the researchers designed a Barcode-Karten media with a barcode with a final exercise using an Android-based game. This exercise is designed with the LearningApps platform,

which will be done at the end of the Barcode-Karten game to determine the vocabulary mastery of Artikel. Practice with LearningApps can be accessed via the barcode on the card packaging.

Based on the previous research explanation above, the researcher intends to develop Barcode-Karten learning media (cards with barcodes) to improve Artikel with Haustiere theme at SMA Laboratorium UM. Barcode-Karten is a picture card with a barcode consisting of 10 cards in each packaging set. A card display with pictures and Artikel with Haustiere theme on the front. There is a barcode on the back of the card to access the audio pronunciation. Once students understand the contents of each card, they can practice with LearningApps, which can be accessed via the barcode on the packaging. Barcode-Karten was developed to help learn German, especially the mastery Artikel with Haustiere theme for students of class XI Cross-Interest German at SMA Laboratorium UM.

The development of Barcode-Karten has never been developed as a learning media. Artikel of German nouns on the Haustiere theme in class XI students of Cross-Interest German Language SMA Laboratorium UM before. Therefore, this research and development are essential to do in order to determine the feasibility of Barcode-Karten as a medium for learning Artikel with Haustiere theme of students in class XI Cross-Interest German at SMA Laboratorium UM.

## 2. LITERATURE REVIEW

### 2.1 "Spitte" Card Media Improve German Language Skills

Card game media can be a choice of media to help learn German. Research by Alanmiati proves that learning with the media card game "Spitte" can help learn German at the A1 level [20]. This "Spitte" card media research raised the theme of Kleidung and research subjects from students of the Department of German Literature, State University of Malang. In contrast to the "Spitte" card used to practice speaking skills, the researcher developed a learning media that focuses on improving the mastery of German noun Artikel.

### 2.2 The "Gerbanz" Game Media for German Vocabulary Study

Another study from Kariza showed that using game media as an alternative to improving German vocabulary mastery can make learning engaging, effective, and fun [21]. From observations made by researchers at SMA Laboratorium UM, students experience the same problem as Kariza's research. The researcher intends to develop a card game media with audio that is not only to practice vocabulary mastery of German noun Artikel but also to learn the pronunciation. Therefore, the researcher wants to add a barcode feature to access the audio pronunciation of vocabulary on card game media.

### 2.3 The Android-Based Game Learning Media to Increase Vocabulary and Motivate Students to Learn German Language

Research from Rosita shows that the Android-based game learning media obtained good results in increasing vocabulary mastery and motivating students to learn German [12]. With satisfactory results on this media, the researchers designed a Barcode-Karten media with a barcode with a final exercise using an Android-based game. This exercise is designed with the LearningApps platform, which will be done at the end of the Barcode-Karten game to determine the vocabulary mastery of Artikel. Practice with LearningApps can be accessed via the barcode on the card packaging.

## 3. METHODS

### 3.1 Research and Development

This research and development adapt the modified Borg and Gall development model. This research model was chosen because it follows the plan of the researcher, who will conduct two studies. There are ten stages in the research and development model, according to Borg and Gall, as follows: (1)

Preliminary Research, (2) Research Planning, (3) Product Development, (4) Trial Phase 1, (5) Revision Phase 1, (6) Trial Phase 2, (7) Revision Phase 2, (8) Trial Phase 3, (9) Revision Phase 3, and (10) Dissemination and Implementation Phase [22].The following are the stages of the Borg and Gall research model that have been modified for this research.



Picture 1. *Barcode-Karten* Research and Development

### 3.2 Data Collection

Data on research and development of *Barcode-Karten* media are sourced from questionnaire sheets compiled using a Likert scale. The Likert scale is a scale to measure the attitudes, opinions, and perceptions of a person or group of people [23]. This study has four questionnaires: media expert validation, material expert validation, Small-Group trial, and Large-Group trial.

Every item with a Likert scale has levels: of strongly agree, agree, hesitate, disagree, and strongly disagree [22]. To obtain data in this study, researchers only used four alternative answers.

4 = Strongly agree                    2 = Disagree
3 = Agree                             1 = Strongly disagree

The statement in the questionnaire was made concerning the Feasibility criteria for learning media proposed by Walker and Hess. There are three aspects of the learning media assessment criteria, namely: (1) content and objective aspects, (2) instructional aspects, and (3) technical aspects [24]. The subjects of this research are material experts, media experts, and students of class XI Cross-Interest German at SMA Laboratorium UM.

### 3.3 Data Analysis

There are two types of data in this study, namely quantitative data and qualitative data. Quantitative data are in the form of assessment scores contained in the questionnaire sheet, while qualitative data are obtained from comments and suggestions given by test subjects. These two data are used to categorize the feasibility of Barcode-Karten media as an alternative media for supporting German language learning with the Haustiere theme. Quantitative data were analyzed using qualitative descriptive analysis techniques with percentages. The following is the percentage formula used in analyzing the data in this study by Akbar and Sriwijaya [25].

a.    The formula for managing the data for each statement in the questionnaire.
$$P = \frac{x}{xi} \times 100\%$$

Information:
P        = Percentage
100%   = Constants

x         = Respondents' answers in one item

xi       = Answer the ideal deal of the respondent in one item

b.     The formula for managing the data for all statements in the questionnaire.

$$P = \frac{\sum x}{\sum xi} \times 100\%$$

Information:

P        = Percentage

100%  = Constants

$\sum x$     = The total number of respondents' answers in one item

$\sum xi$    = Total ideal score in one item (obtained by multiplying the number of respondents who gave responses with a maximum score of 4)

After obtaining the data results in the form of percentages, the researchers then categorize them based on the media Feasibility category [26]. From this category, researchers can conclude the feasibility of *Barcode-Karten* media as an alternative learning media to support vocabulary mastery *Artikel* with *Haustiere* theme in class XI Cross-Interest German at *SMA Laboratorium UM*.

Table 1. Media Feasibility Category

| Percentage | Media Feasibility Category |
|---|---|
| 81% - 100% | Verry Well |
| 61% - 80% | Good |
| 41% - 60% | Enough |
| 21% - 40% | Not Enough |
| <21% | Verry Less |

Meanwhile, qualitative data were obtained from comments and suggestions in the validation and trial process. Qualitative data is then analyzed through three stages: simplifying the data, presenting the data, and drawing conclusions. All data are then concluded and presented descriptively to determine the feasibility of Barcode-Karten media as an alternative learning medium for Cross-Interest German subjects with the Haustiere theme for class XI SMA Laboratorium UM.

## 4. RESULT AND DISCUSSION

The preliminary research stage is an initial study activity in the form of gathering information related to the literature review, classroom observations, and problem identification. Researchers carried out this stage during internship (KPL) and Teaching Assistance activities at SMA Laboratorium UM from August 9 to November 15, 2021. From observations made by researchers in class XI Cross-Interest in German, it was found that students had difficulties memorizing the vocabulary of the Haustiere theme being taught. Learning orientation focused on rote learning makes the vocabulary learned challenging to remember for a long time. An unstructured interview with a German teacher, Mrs. Angesti Murdaningsih, S.Pd., found that the Haustiere theme is a vocabulary material that takes work to conquer. Students need help remembering the Artikel and pronunciation of the vocabulary. This is the main problem at class XI Cross-Interest SMA Laboratorium UM faced when studying German with the Haustiere theme.

### *4.1 The research and Development Barcode-Karten Media*

The research and development flow of *Barcode-Karten* media is described as follows.

Picture 2. The research and development flow of *Barcode-Karten* media

After determining the main task, at the planning stage, the researcher decided to design a learning media called Barcode-Karten (picture cards with barcodes). This media is chosen because card media is often used as an alternative learning media that is effective and fun [17]. Barcode-Karten media is arranged to make it easier for students to improve vocabulary mastery of German Artikel with Haustiere theme and how to pronounce them in class XI Cross-Interest German at SMA Laboratorium UM.

The next phase is the product development. At this stage, the researcher prepares the material for the product and practice. Barcode-Karten media is composed of cards, packs, and practice on LearningApps, which designed by Canva (Link: https://www.Canva.com/). The creation of barcodes on media is made with the QR Scanner application and practice questions in the form of games designed through LearningApps (Link: https://LearningApps.org/).

In card design, researchers combine images, writing, and colors that can visually attract students' attention. Sundari states that visual presentations from the media can improve students' focus and memory of the material discussed [27]. In addition to the visual presentation on the card, the Barcode-Karten media has a barcode to access audio pronunciation of German vocabulary. Students can understand the pronunciation of each Haustiere theme vocabulary loaded on the card from this feature. The researcher designed the card by Canva, measuring 5 cm x 8 cm. In one Barcode-Karten package, there are ten cards. The audio on the card is made with sound recordings in mp3 format, which are uploaded to Google Drive. The audio recording file link is converted into a barcode using a QR Scanner so students can access it easily by a card. This audio contains the pronunciation of the German noun article, the Haustiere theme, repeated three times.

The ten Barcode-Karten cards contain vocabulary Artikel and German nouns with the theme Familie with the sub-theme Haustiere, which the researcher chose based on the material discussed in KPL activities at SMA Laboratorium UM Malang, namely as follows.

1. *Die Katze* (cat)
2. *Der Fisch* (fish)
3. *Der Hund* (dog)
4. *Der Vogel* (bird)
5. *Das Kaninchen* (rabbit)
6. *Das Schwein* (pig)
7. *Das Schaf* (sheep)
8. *Die Ente* (duck)
9. *Die Kuh* (cow)
10. *Der Hahn* (cock)

Barcode-Karten packaging is designed to resemble the shape of card packaging in general, in the form of blocks and four sides. On the packaging and cover are a title, picture, theme of the material, and the researcher's name. On the left side are instructions for the Barcode-Karten game written in German and Indonesian. The right side of the package contains a barcode to access the video

instructions for using the Barcode-Karten media. On the back of the package is a barcode for doing practice on LearningApps.

Practice on Barcode-Karten are designed using LearningApps. The researchers chose this platform because it is easy to access and has features that support vocabulary practice Artikel with Haustiere theme. Using LearningApps, researchers can design practice using images, text, audio, and even video. For the Barcode-Karten exercise, the researcher made a question consisting of three levels of questions, namely in the form of pictures, audio in the form of words, and audio in the form of sentences. The results of the practice on LearningApps can be presented in the form of the word, pdf, and excel so that they can be easily accessed.

Practice on LearningApps are used as a means of repeating vocabulary material that has been learned from the cards. Students are asked to group images and audio according to the relevant German Artikel . Three columns with different colors distinguish German noun Artikel s, namely der, die, and das. The practice on LearningApps consist of six images, three audio in the form of words, and three audio in the form of sentences which can be detailed as follows.

1. Cock picture (*der*)
2. Bird picture (*der*)
3. Sapi picture (*die*)
4. Cat picture (*die*)
5. Rabbit picture (*das*)
6. Sheep picture (*das*)
7. Audio *Ente* (*die*)
8. Audio *Hund* (*der*)
9. Audio *Schwein* (*das*)
10. Audio " ... *Katze heißt Tomy*." (*die*)
11. Audio "... *Kaninchen ist grau und weiß*." (*das*)
12. Audio "... *Fisch schwimmt im Fluss.*" (*der*)

### 4.2 Material Expert and Media Expert Validation Results

The Barcode-Karten media then goes through the expert validation stage to assess the feasibility of the Barcode-Karten media as a learning medium before the next trial stage. In this stage, the Barcode-Karten media went through two expert validations, namely by Dr. Dudy Syafruddin, S.S., M.A. as the material expert and media expert by Robby Yunia Irawan, S.Pd., M.Pd. The researcher carried out the first revision stage from the validation results to improve the Barcode-Karten development product. The results of the Barcode-Karten media expert validation test can be seen in the following table.

Table 2. Material Expert and Media Expert Validation Results

| Validator | Percentage | Media Feasibility Category |
|---|---|---|
| Material Expert | 96.15% | Verry Well |
| Media Expert | 92.11% | Verry Well |

From the results of expert validation that have been described, Barcode-Karten media is included in the appropriate category as a learning medium for mastery Artikel with Haustiere theme with some improvements made from criticism and suggestions given by expert validators. The material expert stated that the Barcode-Karten media was exciting and suitable for needs, but there needed to be improvements to the LearningApps exercise audio and the instructions before starting the LearningApps exercise. Meanwhile, media experts provided comments and suggestions by adding more detailed instructions on accessing barcodes on cards and packaging, ensuring audio accessibility on devices, and indicated on barcode scanning instructions. From this suggestion, the researcher made an instruction sheet for scanning barcodes to make it easier for students to access the audio on the barcode.

The researchers made several improvements from the results of the validation test of media and material experts before carrying out the Small-Group trial phase. This stage is the revision stage of the validation results in the development of Barcode-Karten media. The improvement of Barcode-Karten media based on expert validation results can be seen as follows.

Picture 3. Display Packaging Before Revision
of Validation Result



Picture 4. Display Packaging After Revision of
Validation Result

The appearance of the packaging has changed on the front side, and improvements have been made to writing titles, themes, images, and descriptions to clarify the delivery of Barcode-Karten media information according to suggestions from media experts. In the title of the previous user manual, "Spielregel', improvements were made to "Spielanleitung". In addition, writing "macht die Übungen!" as a description on the barcode changed to "machen Sie die Übungen!" According to material expert advice.

Adjustment of images, writing, and colors is vital in attracting students' attention to the learning media used [27]. Using media experts' advice, researchers modified packaging, cards, and instruction sheets to attract interest and make it easier for students to understand the information conveyed.



Picture 5. Audio On *LearningApps* Before
Revision of Validation Results
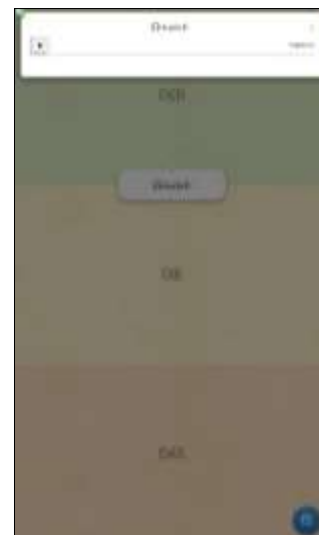


Picture 6. Audio On *LearningApps* After
Revision of Validation Results

The audio presented in the previous LearningApps game practice was designed directly using the audio features on the LearningApps platform. However, the resulting sound could be more explicit and easier to understand. Therefore, material experts recommend changing the audio with a voice recording so it can be heard clearly. Audio is designed with mp3 recordings and uploaded on the LearningApps platform.

Picture 7. Display of *LearningApps* Instructions Before Revision of Validation Result



Picture 8. Display of LearningApps Instructions After Revision of Validation Result

The practice instructions on the LearningApps game before the revision of the validation results could have informed the practice better, so it could lead to misunderstandings in doing the practice. With suggestions from material experts, the game practice instructions on LearningApps have changed from the previous one containing the statement "Der, die, oder das?" becomes "der, die, oder das? (der, die, atau das?). Welcher Artikel ist richtig? Passen Sie! (Mana Artikel yang benar? Pasangkanlah!)". Explanations containing German and Indonesian are used to make it easier for students to understand the game instructions while increasing students' German vocabulary.



Picture 9. Display of The Instruction Sheet For Scanning Barcodes on Barcode-Karten Cards
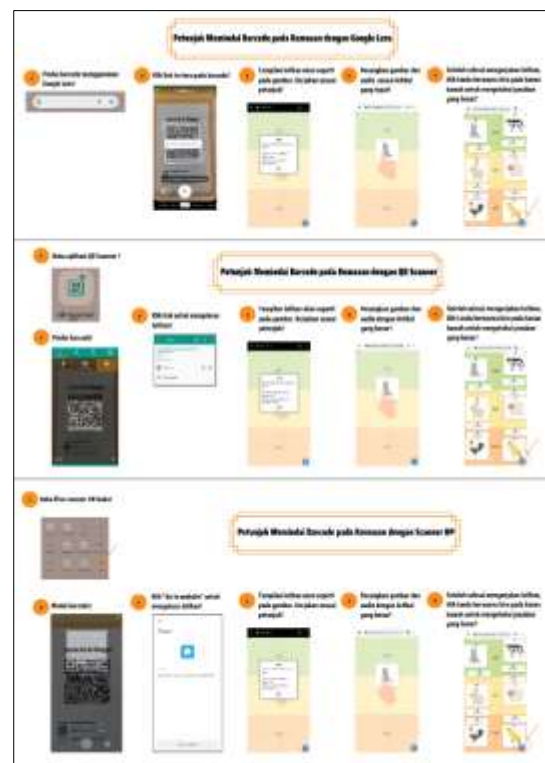


Picture 10. Display of The Instruction Sheet For Scanning Barcodes on Barcode-Karten Packaging

In the validation test, scanning the barcode was a problem because it was accessed with the wrong application. From this incident, media experts suggested making a barcode scanning instruction sheet so students can avoid mistakes in using Barcode-Karten media. The instructions for scanning barcodes explain the stages of scanning barcodes using the Google Lens, QR Scanner, and Mobile Scanner features. The steps described are to access the audio barcode on each card and the barcode on the packaging to access the practice on LearningApps.

### 4.3 Small-Group Trial Results

After revising the validation results on the criticisms and suggestions of experts, the researchers conducted product trials. In the Barcode-Karten research and development, there are two stages of trials, namely Small-Group trials and Large-Group trials. The Small-Group trial stage for Barcode-Karten media was conducted on August 4, 2022, to ten students from class XI Cross-Interest German language interests at SMA Laboratorium UM. The research subjects in the Small-Group trial were selected from the students with the highest grades in the class. The results of this Small-Group trial were obtained from student questionnaires which can be seen in the following table.

Table 3. Small-Group Trial Results

| Small-Group Trial | Percentage | Media Feasibility Category |
|---|---|---|
| **Students** | 87.27% | Baik Sekali |

The results of the Small-Group trial found that the Barcode-Karten media was suitable as a medium for learning German noun Artikel for the Haustiere theme. When learning activities take place, students give positive feedback about Barcode-Karten media. In the learning process, students gave positive Feedback about Barcode-Karten media. The first statement of the Feedback obtained a percentage of 90%, which discussed the interest of Barcode-Karten media students to apply to German language learning in class XI Cross-Interest German Language SMA Laboratirum UM. It can be concluded that Barcode-Karten media can be an attractive alternative learning media to be used in classroom learning activities. This statement is supported by the explanation of Jannah & Hasmawati, regarding the application of learning media in the classroom to foster student interest and understanding of the material raised [17].

The next stage is the revision of the initial product based on the results of Small-Group trial. The suggestions obtained are regarding the stages of using Barcode-Karten media, which students need help understanding. From this suggestion, the researcher made a video on how to use Barcode-Karten media to make it easier for students to understand every step of playing Barcode-Karten learning media. In addition, students experienced problems understanding the questions in the LearningApps exercise, so the researchers explained in more detail the questions and how to do the practice on LearningApps, when explaining PPT (PowerPoint) in the subsequent trial.

In the implementation of Small-Group trial, students were divided into two groups consisting of five students. One of the groups experienced network problems, so they were hampered in accessing the practice, and only one Handphone could be used. From this obstacle, the researcher suggested that students prepare more than one Handphone in each group to avoid the same problem in Large-Group trial.

Picture 11. Display of Packaging Before Early Product Revision



Picture 12. Display of Packaging After Early Product Revision

There were problems when playing Barcode-Karten media games in the Small-Group trial process. Students have difficulty in carrying out the stages of the game, so there is a need for video instructions if the Barcode-Karten media is used independently. From this problem, the researcher designed a video instruction that can be accessed via barcode. The barcode for accessing the instructional video is placed on the side of the Barcode-Karten media package.



Picture 13. Display *PowerPoint* Before Early Product Revision



Picture 14. Display *PowerPoint* After Early Product Revision

### 4.4 Large-Group Trial Results

Several improvements were made in the PPT presentation regarding the LearningApps exercise because it was difficult for students to understand the types of questions that became vocabulary practice for mastery Artikel with Haustiere theme. The researcher clarifies the information on practice questions and provides examples of questions that appear in the LearningApps exercise. The improvement of the initial product revision results from the Small-Group trial data became the material for the Large-Group trial phase. In the revised PPT presentation, it is explained that the practice on LearningApps consist of six images, three audio in the form of words, and three audio in the form of sentences that must be grouped as well as examples of each type of question.

The Large-Group trial is the third stage of the trial conducted in schools to test the feasibility of the product before dissemination. This trial was carried out on the subjects of Class XI Cross-Interests in German at SMA Laboratorium UM, which consisted of 31 students. However, on the day of the Large-Group trial, August 9, 2022, only twenty four students can participate. A total of seven students did not attend due to school activities, namely AKM (Minimum Competency Assessment). The results of this Large-Group trial were obtained from student questionnaires which can be seen in the following table.

Table 4. Large-Group Trial Results

| Large-Group Trial | Percentage | Media Feasibility Category |
|---|---|---|
| **Students** | 88.26% | Verry Well |

The results of the Large-Group trial show that the Barcode-Karten media is worthy of being a vocabulary learning medium for mastery Artikel with Haustiere theme. The existence of video instructions for using Barcode-Karten media helps students understand game instructions. The percentage obtained is 91.67% from the fourth statement item, which states that video game instructions can help make it easier for students to understand Barcode-Karten media.



Picture 15. Students accessing Video Instructions for Using *Barcode-Karten* Media



Picture 16. Display of Video Instructions for Using *Barcode-Karten* Media

The next stage is revising the final product before the dissemination and implementation stage. In the Large-Group trial, the Barcode-Karten media was easy to access and use by the students, so there was no improvement in the media design. It is just that there are obstacles when students access games on LearningApps. Students experience network problems that could be smoother due to the position of the class at the end of the corridor, but this can be resolved immediately and does not interfere with the trial activities. From this obstacle, the following research should be able to choose a class with a stable internet network or prepare a backup plan in case of network problems.

The last stage is Dissemination and Implementation, namely by publishing the research results. After this research ended, the researcher handed over the Barcode-Karten media to SMA Laboratorium UM to be used in learning in class XI Cross-Interest in German. The media submitted with PowerPoint and guidebooks to assist the learning process using Barcode-Karten media.

## 5. CONCLUSION

Barcode-Karten media with Haustiere theme for German vocabulary mastery at level A1 is a supplementary and alternative media to support the learning process in Class XI Cross-Interest German Language at SMA Laboratorium UM. Barcode-Karten is also used as media to support the ability to understand speech in audio form. Based on the objectives of the Barcode-Karten media development research conducted to determine the feasibility of the developed media. The development research results meet the criteria very well or are eligible to complete the media eligibility criteria. It means that the media developed is appropriate and effective for generating interest, learning motivation, and understanding of the learning material presented.

Further Barcode-Karten media research can be used for other themes, skills, or learning. The number of cards in the packaging can be added, and the Barcode-Karten content format can be adjusted according to the teacher's needs. Taking into account the use of media that students can use in groups or individually, teachers should be able to create conditions that encourage students to achieve competence in learning through Barcode-Karten media.

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