

Conference Paper

BRIX: A Gamified Application-Based Platform in German Language Learning for Beginners

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ABSTRACT

The landscape of foreign language learning has transformed due to technological advancements and innovative approaches. Among the noteworthy approaches is the integration of game elements, or gamification. Gamification has demonstrated its ability to enhance motivation, engagement, and learning outcomes across various contexts. In the realm of beginner-level German language instruction, the utilization of a gamified application-based platform presents itself as an innovative and effective method. This study is a development study that incorporates gamification elements in German language learning for beginners through an app-based platform called "BRIX". The research methodology comprises several stages, including needs analysis, design, development, implementation, limited trials, and evaluation. Data collection involves language proficiency tests, surveys, and observations of user interactions with the platform. The findings of the study indicate that the utilization of the BRIX platform has a positive impact on the process of learning the German language. Individuals utilizing the BRIX platform tend to demonstrate improvement in understanding grammatical structures, enriching vocabulary skills, and enhancing communication abilities for everyday situations. Additionally, the levels of engagement and motivation among participants are proven to be higher when compared to conventional teaching methods. Several recommendations emerge as valuable guidelines for future research include developing an advanced version. These include the development of an advanced version of the BRIX platform with enhanced interactive features, adjustable difficulty levels, and social integration for user interaction. Furthermore, adapting the BRIX platform for other subjects could provide insights into the effectiveness of gamification across various educational domains.

Keywords: Beginner, game, German language, platform

Introduction

Gamification refers to the implementation of game design elements in contexts outside the realm of games themselves (Deterding et al., 2011b). The application of gamification brings positive impacts in the field of education, particularly by fostering motivation and active student engagement in gamified learning activities (Hamari et al., 2014). These benefits are also accompanied by improvements in students' achievement scores (Domínguez & et al., 2013). These constructive advantages make gamification an appealing choice in managing classroom or lecture activities. The implementation of gamification requires careful, comprehensive, and adaptable planning.

This is closely related to the tools applied to implement the gamification concept (gamification solutions). In the context of education, especially in the teaching and learning process (PBM activities), various gamification solutions can be used, such as plugins in the

How to cite:

Aini, D. N., Asmorodina, I., & Damayanti, E. A. (2024). BRIX: A gamified application-based platform in German language learning for beginners. *The 14th Annual International Symposium of Foreign Language Learning*. NST Proceedings. pages 23-32. doi: 10.11594/nstp.2024.3803

Learning Management System (LMS), applications in collaboration with third parties, and standalone gamification application development (Dicheva et al., 2014). However, some users feel that existing gamification solutions lack flexibility and are limited by the existing gamification solution environment (Kristiadi & Mustofa, 2017).

The main objectives of gamification are to enhance specific skills, introduce goals that provide learning objectives, engage students, optimize learning, support behavior change, and socialize (Alsaqqaf & Li, 2023). Learning that utilizes gamification as an effective intermediary tool in conveying information to students, especially foreign language learning is German (Aini & Demara, 2023). According to Aini et al, gamification integrates game elements into the German learning environment, creating a more engaging and interactive experience for students. Game elements such as challenge, reward, and competition can increase students' motivation to learn German. Students feel more motivated to complete language tasks, face challenges, and achieve rewards in a competitive learning environment (Nurmiati & Mantasiah, 2017). The implementation of gamification encourages students' involvement in interacting with learning materials actively. They can engage in word competitions, participate in German-speaking activities, or engage in group games that require them to communicate in the language being learned. This effectively encourages language use in the context of everyday situations. In the context of gamification, immediate feedback is given to students after completing a task or challenge. This plays a role in helping students understand the mistakes they make and make immediate corrections, which in turn contributes to accelerating the learning process (Aini & Kirana, 2023). By utilizing gamification, learning German can become more interactive, engaging, and effective. It provides a more enjoyable learning environment and helps students feel more engaged in the process of learning a complex foreign language such as German.

One of the electronic-based learning experiences applied to students, especially high school students in Malang Raya, is the use of learning, which is a learning media that provides general electronic information and educational content that helps achieve knowledge without regard to location and time. It can be a supporting medium in all types of distance learning. Currently, learning is used by all groups, such as students, college students, and even professionals. This learning media aims to facilitate the learning and teaching process in an interactive, modern, and efficient way by combining games, quizzes, and videos on German learning materials. In the process of learning and teaching communication at a distance, learning media is part of mobile learning (m-learning) (Chatwattana et al., 2023). Mobile learning is one of the alternatives that learning services should be implemented anywhere and anytime.

The German gamification solution is a gamification platform. A gamification platform is an application that provides an Application Program Interface (API) and Graphic User Interface (GUI) to implement gamification design. The application-based game developed to explore the gamification component in learning German is Learning-App BRIX. The application named Learning-App BRIX not only includes the concept of learning knowledge as the main element but also involves games and multimedia, making it more interesting for students. BRIX is a platform video game developed by the Brix UM team for Android and IOS. Set in the era of World War 2 in Germany. Players will play the role of Stalker, a mustachioed General who is at war with Altof, the leader of a powerful country who dreams of destroying the world.

The game consists of 5 levels with 3 sub-levels each. The enemies in this game can be destroyed with cannons that can be filled if the Stalker answers the German questions (*schreiben*, *lesen*, and *hören*) according to the level correctly. During the game, Stalker will meet Altof's henchmen who must be defeated first before meeting Altof in the last level. By presenting questions at different levels in each round, this game can be of interactive games and hone the German language skills of beginner learners.

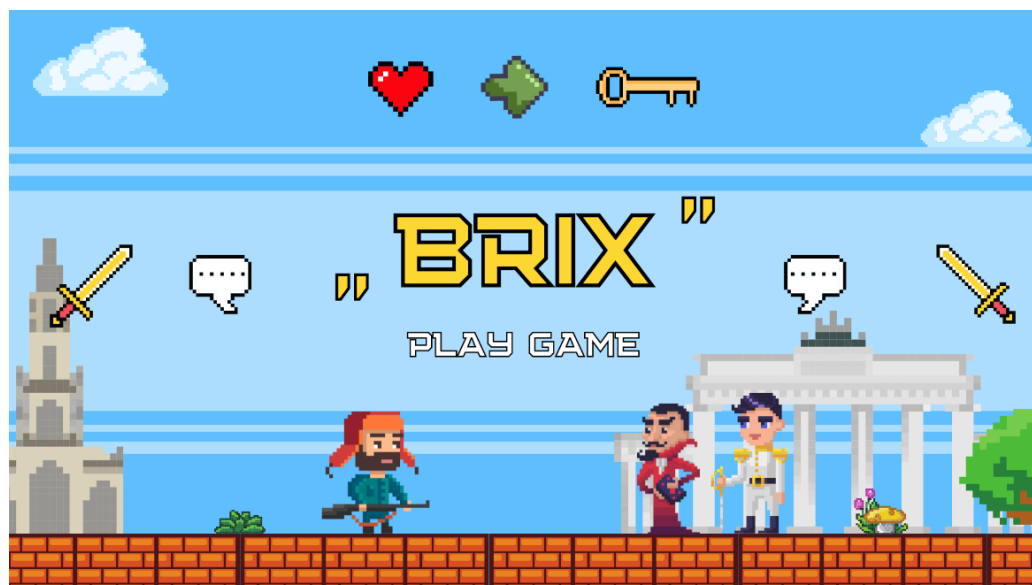


Figure 1. BRIX home page interface



Figure 2. Display of questions in BRIX

Over time, learning media always changes. The challenge for teachers is to always make innovations and updates in the learning process. BRIX is a German language learning application that offers interactive features for students in their independent learning process. In this case, features that are equipped with material and material exercises become the main service, the material presented is in the form of text, video content, and audio. The questions in the test are presented by the material studied by students.

In today's digital era, foreign language learning has undergone a significant transformation through the integration of advanced technology into the educational process. One approach that is gaining increasing attention is the use of gamification in language learning, which incorporates game elements into the learning environment. BRIX, an app-based gamification platform in German language learning for beginners, carries an innovative vision to utilize gamification techniques in the context of German language learning for beginners.

Recent studies have highlighted the positive potential of gamification approaches in education (Dicheva et al., 2014; Novita & Karya, 2014; Kristiadi & Mustofa, 2017; Sholiha & Pujosusanto, 2021), which apply game elements, such as challenges, rewards, and competitions, as they can stimulate student motivation and engagement in the learning process. In 2002, Nick Pelling first introduced the concept of gamification during a presentation at the TED (Technology, Entertainment, Design) event. A gamification is an instructional approach that leverages elements derived from games or video games to enhance students' motivation in the learning process, creating an enjoyable experience and fostering high levels of engagement in learning. Furthermore, this approach can be employed to capture students' interests and inspire them to actively participate in the learning process (Jusuf, 2016). Similar to games that allow players to retry and correct their mistakes, reducing the fear of failure and increasing their engagement in the game, gamification operates in a manner that makes technology more appealing (Hutson et al., 2022). This encourages users to engage in desired behaviors, provides guidance for achievement and autonomy, assists in problem-solving without becoming an impediment, and capitalizes on human psychological tendencies to engage in games (Deterding et al., 2011a). In a broader sense, Deterding defines gamification as the use of design elements resembling those of games within a context outside of the games themselves.

The use of app-based platforms in foreign language learning has also proven its effectiveness, allowing for easy access, interactive interaction, and tracking of individual progress. While the use of technology in education has shown great potential, the specific blend of gamification and German language learning for beginners in the form of apps like BRIX has yet to be researched in depth. While the use of technology in education has shown significant potential, the specific integration of gamification into beginner-level German language learning through applications like BRIX has not been extensively researched. Nonetheless, there are indications that students exhibit higher levels of engagement and motivation when using the BRIX platform compared to conventional teaching methods. Consequently, there is a need for research that directly compares learning outcomes and motivation levels between participants using the BRIX platform and students following traditional methods. This offers an opportunity for researchers to gauge the relative effectiveness of this gamification platform in comparison to conventional approaches.

It is important to recognize that the integration of gamification in education not only affects student engagement and motivation but also brings a more detailed and transparent aspect of measuring progress. The system of points, achievements, and levels in gamification allows students and educators to visually track progress, encouraging better achievement and improved learning outcomes. In the context of German language learning, understanding the role and impact of gamification elements in beginner teaching is crucial. Through platforms such as BRIX, this article aims to explore how gamification can stimulate the learning process of German for beginners. This research not only has the potential to provide new insights into the effectiveness of gamification in language learning but also fills a knowledge gap that exists in the literature regarding the implementation of technology and gamification in the context of German language learning at the beginner level.

Methods

A literature study on gamification design in foreign language learning and gamification platform design started the research process. From these designs, the game mechanics used, the rules used, and a general summary of the design were analyzed. Game mechanics are methods and tools for representing game data. The platform to be developed should empower the game master (instructor) to select the gaming mechanics to be employed, utilizing only mandatory points (Zichermann & Cunningham, 2011). The gaming mechanics supported by the platform include points, badges, leaderboards, levels, progression, avatars, status, notifications, and an activity feed (Kristiadi & Mustofa, 2017). The research methodology comprises several phases, including the

needs analysis, BRIX platform design, application development, limited testing, evaluation, and launch.

Needs analysis

In the context of BRIX web-based application development research, needs analysis is the first step in the application development process. This stage is the stage where researchers understand in depth what application users want and need and how this application can fulfill these needs. The steps required in this stage are identifying users; and collecting data from observations. This stage also determines the functional and non-functional requirements, i.e. the main features and interactions that users expect, as well as the performance of the application that meets the required quality standards.

BRIX platform design steps

The system design in this educational game is generally the same as various games or quizzes designed with html5. In this system design, there is no panel for the admin because it uses more interfaces designed with CSS3 and JQuery. In this application, some modules are also made, namely

- player module
- login module
- German niveau A1 module
- German niveau A2 module
- German niveau B1 module
- score module
- level module
- question module
- answer module
- main menu module

Development stage

The development stage is explained through the following chart.

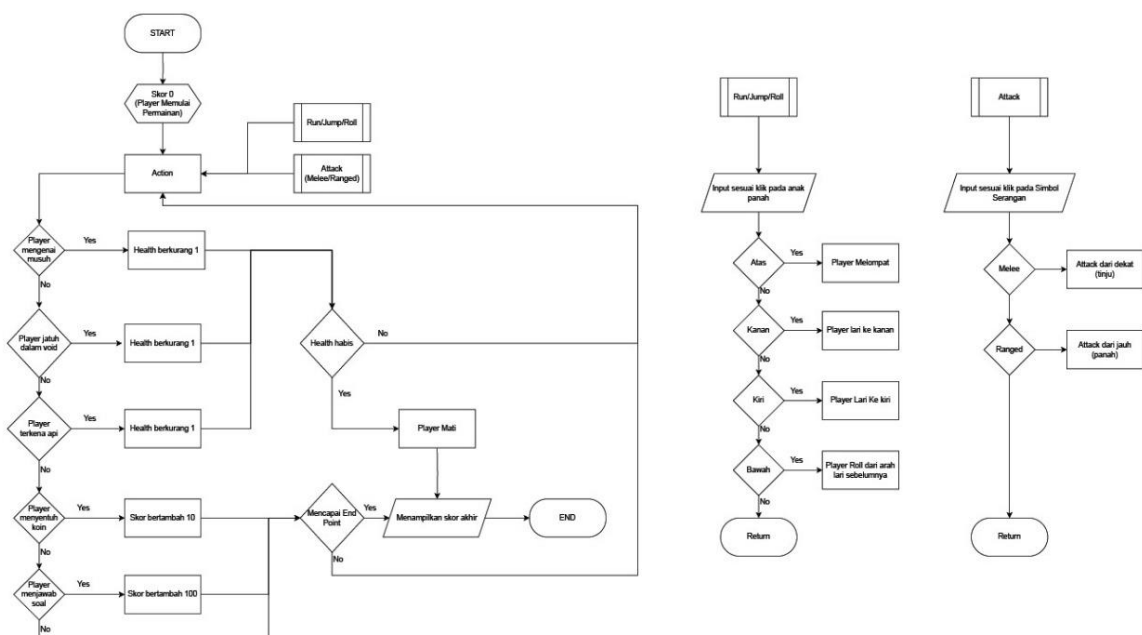


Figure 3. Design of the BRIX Gamification Platform (Application)

Implementation stage

The implementation stage is described in the following user menu flow chart.

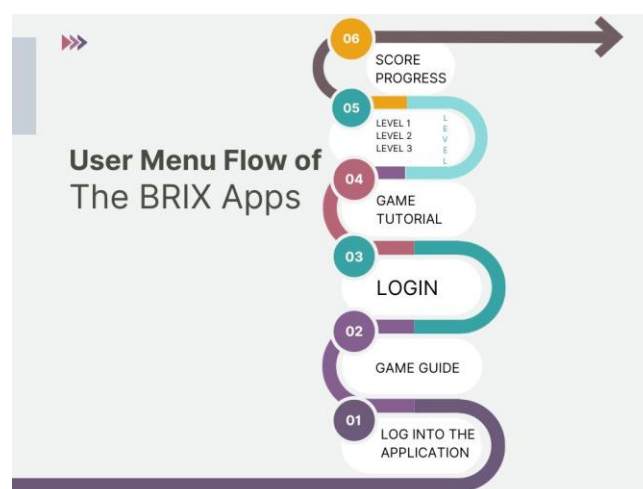


Figure 4. BRIX apps user menu flow

To implement the design that has been made, the programmer starts writing code written in a programming language that is suitable for the technology used.

Limited test phase

The test phase is carried out in a series of post-implementation stages, namely to test software components or modules to ensure the function of the unit/device. Testing is carried out in the form of integration testing, performance testing system testing, and security testing.

Evaluation stage

This stage is the improvement and update stage, i.e. after the application is launched, the application will continue to receive updates and improvements to fix bugs, improve performance, and bring new features.

Respondents of the research

The research subjects involved students of grades X, IX, and XII of the German language at SMAN 1 Bululawang, Malang Regency as the users of this application.

Instruments

The development research instruments used in this study were observation sheets, user questionnaires, material/content validation sheets, and media validation sheets.

Data analysis techniques

The data analysis technique used in the BRIX application media development research is qualitative descriptive analysis, which is an analysis used to understand the meaning and context behind qualitative data. Data from questionnaire results and observation notes, user reviews, and qualitative responses to open questions in the questionnaire, as well as descriptions of material expert and media expert assessments, were identified as themes or patterns for media improvement.

Results and Discussion

The effectiveness of the application in improving learners' German language skills includes aspects of determining the scope of learning, interactivity, ability tests, and the use of supporting

technology. As a first step, the scope of learning must be clear and by the needs of learners in understanding German, namely focusing on listening (hören) and writing (schreiben). The users of the application in the trial were students of SMAN 1 Bululawang Malang Regency, considering the findings of learning problems in the observation at the school quite a lot. Problems in listening and writing language skills are more complex among students. The observation also showed that students tend to prefer collaborative learning and game methods. This is due to the more dynamic and entertaining sensation felt in such a classroom setting. Students feel motivated to learn and have a better ability to remember the vocabulary learned. The research findings indicate that the utilization of educational media can assist students in comprehending the subject matter, concurrently fostering an enjoyable and engaging classroom atmosphere.

Foreign language lessons, especially German, have been widely taught in senior high schools (SMA) and equivalent, one of which is at SMAN 1 Bululawang. German language learning is taught using a curriculum that refers to the GER (Gemeinsamer Europäischer Referenzrahmen) or known as the common terms of reference of European countries that apply internationally as the basis for equivalence in curriculum development, textbook production, and German language tests (Gemeinsamer Europäischer Referenzrahmen für Sprachen, 2004). Exercises using BRIX have been prepared using LearningApps because this platform has easy accessibility and various features that support the practice of German items for each level. With LearningApps, exercises are created using various media such as images, text, audio, and even video. The results of the exercises in LearningApps can be downloaded in Word, PDF, and Excel formats, for easy accessibility.

BRIX then went through an expert validation stage to assess the feasibility of the media as learning media before the next trial stage. Validation was conducted on the material and media. Material validation contains two major aspects, namely aspects of content feasibility, and aspects of presentation feasibility. The content feasibility aspect includes assessment indicators (a) suitability for the flow of learning objectives, (b) material accuracy, (c) material recency, and (d) stimulus to arouse curiosity. The presentation feasibility aspect contains indicators of presentation techniques, presentation support, learning presentation, coherence and conciseness of thought flow, and language presentation. Media validation contains aspects of content and purpose, instructional aspects, and technical aspects.

The results of the activities in the final stage showed the need for revision of the final product before the dissemination and implementation stage. The usability test on the BRIX application must be easy to access and use by users. Obstacles occur when users access the application on LearningApps. Internet network problems that are less smooth can be a recurring obstacle if the school infrastructure is inadequate.

Information Technology (IT) has had a great impact on expanding students' reach to various learning resources (Fatmawati, 2018), especially in this case German language learning. Through IT, students now have easy and quick access to various types of learning materials, including ebooks, journals, videos, and audio in German. In the context of German language learning, the role of IT in providing access to various learning resources is crucial. One of the main advantages of the easy and quick access provided by IT is that students can obtain the most up-to-date learning materials. With the help of technology such as the Internet, students can quickly access the latest and most up-to-date learning resources. They can read the latest ebooks on grammar, vocabulary, or specific topics in German that are developing. These conditions allow students to keep abreast of developments and trends in German language learning (Cindy & Rosyidah, 2020).

In addition, IT also provides a variety of learning resources. Students are not only limited to traditional printed books, but also given access to scientific journals, articles, videos, and audio in German (Fatmawati, 2018). For example, through online learning platforms, students can access reputable scientific journals that discuss German topics in detail. Students can also watch videos and listen to audio in German made by native speakers or experts in the field. Thus, students can experience a variety of learning methods and gain a deeper understanding of the German

language. In addition to getting diverse and up-to-date materials, the access provided by IT also allows students to learn independently (Hanik et al., 2022). They can access German learning resources anytime and anywhere through electronic devices such as computers, laptops, or smartphones. They no longer need to follow a schedule or study in a particular place. It gives students the flexibility to study according to their own needs and schedules. If they want to better understand grammar or improve vocabulary, they can easily search for relevant resources and learn according to their abilities.

Overall, the role of Information Technology (IT) in providing easy and fast access to German language learning resources is very significant. Through IT, students can access a wide range of up-to-date learning materials, enabling them to continuously improve their understanding and skills in German. In a diverse German learning environment, the ease of access provided by IT enriches students' learning experience and helps to gain a deeper insight into the German language (Wenno & Karuna, 2021).

Apps and software designed specifically for German language education have become an effective and popular means of improving students' skills (Nurmiati & Mantasiah, 2017). With the help of Information Technology (IT), these apps provide various types of exercises and features focused on improving grammar comprehension, vocabulary, listening, and writing skills in German. The main advantage these apps have is the ease of access they provide, allowing students to practice German anytime and anywhere, using their mobile devices or tablets.

One example of the latest German learning app is BRIX. Nowadays, access to information has become easier and faster. Different ways of disseminating information make it easier to identify opportunities in introducing products and businesses that are being developed. Opportunities in the market can be identified through the high interest of the public, including students and general individuals, in learning German to improve their language skills (Disnakertrans Provinsi NTB, 2020). It is also critical in the world of employment, especially when companies are looking for new graduates who have language skills as one of the main criteria. Therefore, the development of BRIX is based on the needs of the community in improving language skills that have a positive impact on the sustainability of learning and opportunities in the world of work, as well as promising the potential for sustainability and business success in the BRIX application domain.

Other apps provide similar functionality. Some apps offer interactive exercises and integrate gamification, which is the use of game elements in the learning process. For example, there is an app that offers a variety of German language courses with various learning methods, including vocabulary enrichment exercises with a gamification approach (Aini & Demara, 2023). In it, students engage in various challenges, earn points, and increase their level after completing the exercises. This approach not only makes learning more interesting but also increases students' motivation to continue practicing and improving their German language skills.

The main benefit of a German learning app is the easy access and flexibility it offers. By downloading these apps on their smartphone or tablet devices, students have the opportunity to open them whenever and wherever they are (Aini & Kirana, 2023). For example, they can utilize their free time while traveling or waiting to do German exercises through the app. In addition, the app's ability to monitor students' progress allows them to track their progress individually. Some apps also provide statistics such as the number of completed exercises, success rate, and a comparison of their ranking with other users. This provides extra encouragement for students to continue improving their German language skills. Overall, the utilization of media-rich German learning content helps students to understand concepts better. The use of images, videos, audio, and animations makes the learning materials more interesting, interactive, and easy to understand. By utilizing technology such as IT, students can engage in more enjoyable and effective learning, while improving their understanding of vocabulary, grammar, and language skills in German, in particular, it serves to enhance proficiency in listening (*hörverstehen*) and writing (*schreiben*) skills. The advantages of the BRIX application as a gamified medium for fostering the development of German language skills include the following: (1) the application can

be used offline, eliminating the need for internet data, (2) it offers a visually and auditorily oriented German language learning style, (3) it features interactive exercises, including multiple-choice questions, sentence completion, and matching exercises designed to hone A1 level grammar, integrated into the gaming experience, (4) the application includes high-quality audio recordings by native speakers, offering clear pronunciation, (5) the language content within the application is translated by native speakers without the use of online translators, (6) it can be accessed anytime and anywhere, and (7) it provides an evaluation system within the BRIX app that is linked to instructors. However, the BRIX application has certain limitations, such as the absence of features for practicing speaking skills (Sprechen), and the range of exercises is limited to the A1 or basic level.

Through IT, students are allowed to interact and cooperate with native German speakers or peers learning German in different parts of the world. This opportunity gives them valuable experience for more authentic practice of speaking and writing in German. One of the main ways to communicate and collaborate in the context of learning German is through online communication platforms. Through email, online forums, or instant messaging apps, students can connect with native German speakers who are willing to communicate with them. This opens up opportunities for students to practice speaking and writing in German with those who speak the language as a mother tongue. By interacting directly with native speakers, students can improve their listening and speaking comprehension skills, expand their vocabulary, and increase their confidence in communicating in German (Dirksen, 2010).

Conclusion

The BRIX platform offers a range of significant benefits in enhancing the learning experience of students studying the German language. The gamification approach has proven effective in increasing students' motivation and engagement in the learning process. The platform's flexibility also provides students with the opportunity to study at their own pace while offering various interactive activities that support the development of communication skills in German. The ability to track progress and assess objectively is an essential component in enhancing the quality of learning. As a next step, there is a need for diverse and interactive features to maintain students' high interest. Further consideration should focus on the development of features that enhance speaking skills (sprechen) to meet the requirements of all four language skills within a single application. Additional recommendations are required to integrate multiplayer gaming elements to enable broader collaboration and social interaction, creating a more social and supportive learning environment. By continuously developing and improving the BRIX application, students can effectively enhance their German language skills while making language learning more engaging.

Acknowledgments

This research was supported by Departemen Sastra Jerman, Universitas Negeri Malang. Their support and consideration are highly appreciated.

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