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Digital Transformation in BIPA Learning: Increasing Accessibility and Effectiveness Through Technology

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ABSTRACT

This research aims to understand how digital technology has changed how we learn Indonesian as a foreign language (BIPA). Through an in-depth review of various previous studies, it was found that digital technologies such as e-learning platforms, language applications, virtual reality (VR), and augmented reality (AR) have made a significant contribution to BIPA learning. E-learning platforms such as Moodle and Google Classroom make it easy to access learning materials anytime and anywhere, increasing learning flexibility. Language apps like Duolingo and Babbel, which are integrated with social media, create a more interactive and engaging learning environment. VR and AR technologies take the learning experience to a new level by allowing students to interact with language in a more realistic context.

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INTRODUCTION

The Indonesian for Foreign Speakers (BIPA) program is the linguistic education of Indonesian intended for non-native speakers. Since its establishment, BIPA has developed at such a level that it recognizes the growing desire for Indonesia from all over the world, culturally and economically as well as politically (Ambarwati et al., 2023; Inderasari et al., 2024; Pratama et al., 2023). The learning of the Indonesian language is not just a means of communication but also part of the door to understanding the diversity and richness of Indonesian culture.

There has been quite a transformation in methods of teaching language with the advent of the digital age (Abdurn et al., 2018; Makhachashvili et al., 2021). Technological advancements in e-learning platforms, social media, and other sophisticated technologies have brought changes in both learning and teaching paradigms (Alvarez-Castillo et al., 2022; Graham et al., 2019; Lambton-Howard et al., 2021). It is therefore incumbent upon BIPA to adopt such changes to be relevant and effective in delivering learning materials to foreign speakers. The emergence of digital transformation in education creates ample opportunity for BIPA programs to improve the accessibility, effectiveness, and efficiency of education. In contrast, on the other hand, some obstacles must be overcome, among them technological infrastructure readiness, teachers' and students' digital literacy, and adaptation of conventional teaching methods to a more innovative way. Research is urgently needed so that we understand how the BIPA program can harness

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the digital era, simultaneously pinning down the likely barriers that may be developed, thereafter coming up with possible solutions to overcome the same.

There is also variation and significant evidence of digital technology in teaching languages. Some studies conclude that the use of digital technology may increase motivation and engagement. For example, Karjo and Andreani (2018) proved that applications like Duolingo and Memrise can help learners increase vocabulary and language skills through interactive and repetitive tasks.

Further relevant research, as carried out by Reinders and Benson (2017), also demonstrates the fact that, along with e-learning and associated online learning platforms, such as Moodle and Google Classroom, learners are most likely granted flexibility in the process of language learning, to go on with their studies according to their rhythm and time. Other technologies, such as virtual reality and augmented reality, have also been demonstrated to effectively create opportunities for immersive learning experiences that help students understand cultural context and language use in real-life scenarios.

However, although the good potential of these digital technologies for the area of language learning has been proved in several studies, several issues are crucial. For instance, Kessler (Kessler, 2024) argues that limited access to technology and insufficient digital literacy on the part of both instructors and learners may serve as obstacles to the implementation of digital technology in language instruction.

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While the overall use of digital technology in language learning has gained recent discussion, there is a lack of literature on its specific implementation in BIPA programs. Most studies have tended to address the issue generally on how digital technology can help in teaching language without putting much emphasis on the needs and characteristics of foreign speakers learning Indonesian. In addition, research remains very scanty on the effectiveness of digital technologies for BIPA instruction, especially the possible long-term effect on students' language competence.

This study, therefore, will try to fill that gap by investigating how digital technology can be used and optimized in BIPA programs while providing an enumeration of the encountered challenges and practical recommendations on how to overcome them. We are hopeful that this research will make a significant contribution toward the development of more effective and adaptive BIPA teaching methods in the digital age.

METHODS

This research employs the SLR method in providing a comprehensive review of the literature pertaining to the utilization of digital technology in teaching Indonesian as a foreign language (BIPA). SLR is a structured and systematic approach to identifying, evaluating, and synthesizing existing research findings. I chose this method because it allows a researcher to get an in-depth overview of a topic under study, trends in the information, and research gaps.

Data sources were identified first through the review of scientific journals, books, conference proceedings, and dissertations associated with the

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study. A comprehensive literature search was conducted through a range of academic databases, such as Google Scholar, JSTOR, ScienceDirect, and ProQuest. This review includes articles published in the last 10 years and written in either the English or Indonesian language. It should address the use of digital technologies in language teaching and learning contexts, or the development of BIPA. This includes sources that are not peer-reviewed, unofficial reports, or those that generally lack data presentation in the first place.

A keyword search with keywords such as "BIPA," "digital technology in language teaching," "e-learning in language education," "virtual reality in language learning," and "social media for language learning," along with a combination of other related keywords, was done. Articles were selected based on the title and abstract found from the initial search. Full-text articles were read if they met the pre-specified inclusion criteria.

The data was analyzed through a series of stages. Key information from each of the articles, which covered research objectives, methodology, findings, and conclusion, was extracted and recorded in a prepared worksheet. The findings were synthesized to summarize the key themes, trends, and gaps in the literature. Thereafter, data was further categorized into key specific categories such as the type of technology used, the effectiveness of the methods employed, and the challenges that were faced. In this regard, the findings obtained from the synthesis of data were organized in a structured narrative that would include a summary of the main findings, a

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discussion of trends and patterns identified, and an identification of research gaps.

In the process of researching a systematic literature review, data validation involves using varied approaches that ensure the data obtained is reliable and accurate. In this study, the technique of data source triangulation was used, where multiple sources of data are used to ensure consistency and reliability of the findings. A large bird's eye view was obtained by analysis of articles from various journals and authors. In addition, all data analyses and syntheses were peer-reviewed by experts in BIPA and educational technology to avoid potential bias and ensure that the interpretation of the data was relevant to the study context. Finally, re-screening was done through auditing the selected and analyzed articles again to ensure that no important data were missed or misinterpreted. Thus, this helped in the maintenance of consistency and accuracy of data in the study.

RESULT AND DISCUSSION

Technological Developments in Language Teaching

Due to the advancement in digital technologies, there has been a real transformation in the methods used in teaching and learning. E-learning and digital platforms have been of great help in the process of learning by making it easier. For instance, Moodle and Google Classroom are instrumental in developing online courses. Through Moodle, students can access learning material, do their assignments, take quizzes, and participate in discussion forums. Such features enable students to learn independently and according

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to their own pace, while facilitating interaction between teachers and students (C.-C. Huang et al., 2013).

Google Classroom belongs to the Google environment, so it is easy to use. Among other productivity tools to be integrated with Google Classroom are Google Docs, Google Slides, and Google Meet, allowing the instructor to always track student activities and provide immediate feedback. Besides, the use of Google Classroom helps the students collaborate during group activities.

With the incorporation of e-learning, language-learning apps like Duolingo and Babbel have, in their way, revolutionized the process by which students pick up a new language on their own (Fryer et al., 2014; Makhachashvili et al., 2021; Thamarana, 2016).

Other educational benefits include that the use of social media has further supported and enhanced Instagram, YouTube, and TikTok. Through its largely visual style, Instagram gives educators the opportunity to help reach their target audiences much more effectively. For example, educators are able to create stories with new vocabulary, idioms, and everyday expressions and use the same stories feature to share tips for language learning (Hidayati et al., 2023; Yeh & Mitric, 2019).

Another option is YouTube, which has a lot of free-of-charge videos available. Teachers can create their own channel where they can upload tutorials, explanations of grammar, and listening exercises. Furthermore, students can also find videos on culture and language use in real-life situations by native speakers (Kessler, 2023). On its part, the short-length

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video format of TikTok enables a creative educator to create very brief but quite insightful resources. They can create videos on new vocabulary, conversational dialogues, and pronunciation tips. This kind of creativity in using social media will increase student motivation to learn the language and make it even more engaging and fun (Hu & Du, 2022; Lee, 2023).

In addition, artificial intelligence in teaching languages has made it easier to produce new and personalized learning resources. More so, AI can be used to produce intelligent learning applications that are based on the student's learning needs. For example, AI software can analyze student mistakes and offer them relevant feedback to help correct their mistakes. Another AI subfield, machine learning, enables the creation of systems that can learn from data to get better over time. Regarding language learning, chatbots have been developed using machine learning to enable these chatbots to speak to students in the target language. Such chatbots hold conversations that seem real to their participants and are a valuable source of speaking practice for students (W. Huang et al., 2022).

Furthermore, AI helps in developing automated assessment tools that are objective and effective for grading the language competencies of students. Such tools grade the writing as well as speaking competencies of the students based on certain algorithms that consider the structure of language, grammar, and vocabulary (Hashim et al., 2017; S. Wang et al., 2019).

The coming of digital means, which are e-learning, social media, and AI, has changed the way of language teaching. Such means have brought along access to and flexibility in learning. Technologies enable teachers to

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develop better and more engaging learning experiences. As such, more research needs to be conducted so that these technologies are implemented to their full potential while teaching Bahasa Indonesia to speakers of other languages (BIPA), and the technologies used will best serve the students adaptively and responsively as per their needs.

Methods of Teaching BIPA in the Digital Age

Indeed, in the digital age, modernization of Indonesian for Speakers of Other Languages (BIPA) teaching methods toward enhancing the effectiveness of learning has significantly been revolutionized. Modern methods adopted include blended learning, gamification, Virtual Reality, and Augmented Reality technologies. These methods have transformed ways of teaching while making the learning process for students way more enriching. Blended learning is a form of technology-based learning that combines face-to-face teaching with online learning (Karavas et al., 2021; Lestari, 2021).

The model enables a teacher to exploit the advantages embedded in both learning approaches. Students will have flexible access to resources since they are not time-bound owing to the use of blended learning. Face-to-face sessions ensure that there is physical interaction, detailed discussion, and real-time monitoring of student progress. The author also goes on to note that blended learning makes the material more accessible and enhances the process through an amalgamation of diverse teaching strategies. Thus, the combination allows for the achievement of better learning outcomes and enables the adjustment of taught strategies according to the individual needs of the students.

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In addition, learning through gamification may be an effective technique in teaching BIPA. By integrating certain game elements, such as points, levels, and challenges, within the learning materials, motivation and engagement are increased. The use of game elements in the learning process brings up excitement and a sense of competitiveness that encourages one to be active and strive to put in more effort while learning. For example, it is just the Duolingo application that has succeeded in applying gamified techniques to make language learning more attractive and motivational. Gamification boosts the student's engagement level and reinforcement of language skills by repeating and practicing interactively.

The implementation of Virtual Reality together with Augmented Reality technologies is driving toward a new paradigm of methodologies for learning, where immersion and interactivity could be reached at higher levels (Zou et al., 2023). A virtual simulated environment established by Virtual Reality technology will enable students to act as part of the language context in direct interaction as if they were located in a country where native speakers lived. Using VR, students can put themselves in real-world settings conducted in the target language, say, for example, shopping in a market or visiting places of tourism, which will help reinforce their understanding of language use in a real context (Ortega et al., 2017).

The integration of blended learning, gamification, and VR and AR technologies in BIPA teaching offers new methods of teaching. These techniques increase flexibility, interaction, and relevancy in learning, resulting in better learning outcomes through the creation of an engaging and adaptive

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experience. It is expected that with the advancement of technology, exploration, and applications of these methods will also expand to meet the needs of effectively learning Indonesian for foreign speakers.

Challenges and Opportunities

Implementation in teaching Indonesian for Speakers of Other Languages (BIPA) in the digital era brings forth several limitations and opportunities that should be carefully considered. The use of digital technology has several advantages: convenience, novelty in learning, access to technology, teacher readiness, student readiness, and innovation and creativity in methods of teaching that need to be adhered to in order to achieve the most possible results.

The most significant challenge, meanwhile, to the teaching of BIPA in the digital era is limited access to technology. In most countries, access to the internet and technological devices remains at large a very big challenge, especially in areas with low technological development and infrastructure. According to a 2019 report by the World Bank, it is estimated that approximately 47% of the world's population does not have reliable internet services. This makes it impossible for students to effectively take part in online learning. In addition, there is also the issue of a lack of devices such as computers and smartphones. It is, for this reason, important that remedies be sought in a bid to advance technological access; among them is the adequate supply of technology and aids for needy students.

It also adds the readiness for teachers and students to deal with digital technology. This might impair the effectiveness of the teaching process if the

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BIPA teachers and students lack digital literacy. A study by Haleem et al. (2022) indicates that most teachers are not yet exposed to the use of digital tools within the class setup. As a result, there will possibly be poor integration of technology. Besides, students will also find it hard to adapt to the new modes of teaching. Therefore, it is absolutely important that training programs and any other activities that help in acquiring digital skills for both teachers and students be put in place. Help teachers and learners make better use of technology by enhancing digital literacy.

However, it brings an amazing opportunity to develop better and more effective teaching methods that are innovative and creative. This beginning of digital times is a window of opportunity prompting innovative learning approaches like interactive learning apps, gamification, Virtual and Augmented Reality, among others. Examples include those created to be game-based to raise student interest and engagement in language learning. In addition, using VR and AR for the purposes described will create an indeed immersive and contextualized experience which will help the students in better understanding the real-life language usage.

Besides, it is also through the collaboration of educators, technology developers, and linguists that a large variety and richer learning materials are brought about. These innovations improve pedagogical approaches and bring opportunities for the students to learn more interactively and effectively. Hence, it is through nurturing creativity and innovation in BIPA teaching that the full potential of digital technology can be realized.

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The Positive Impact of the Digital Age on BIPA Teaching

With the rise of the digital era, an array of positivity is being thrown onto the discipline of Indonesian for Speakers of Other Languages (BIPA). This influx of digital technologies has not only modernized pedagogical practices but also opened new ways of accessibility, global collaboration, and student motivation. All of these contribute to increasing the quality and effectiveness of BIPA programs internationally.

Firstly, the advent of the digital age has significantly increased the accessibility of language learning for foreign speakers worldwide. The emergence of the internet and e-learning platforms has made Indonesian learning materials available to individuals irrespective of their geographical location or time zone. This allows students from various regions to engage in Indonesian language studies without the limitation of physical proximity to educational resources. According to a UNESCO report published in 2020, the integration of digital technology in education has granted millions of students access to previously unavailable educational opportunities. Platforms like Moodle and Google Classroom allow educators to distribute learning materials online, which students can download and study at their convenience. Consequently, the digital era has expanded the opportunities for individuals to learn Bahasa Indonesia and appreciate Indonesian culture, thereby fostering the global dissemination of both the language and culture.

Furthermore, the digital age has enabled global collaboration between educational and cultural institutions across different countries. The advent of digital technology has enhanced communication and collaboration, leading to

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more efficient and streamlined operations. For instance, BIPA programs can be conducted in partnership with Indonesian and overseas universities through online platforms. This cooperation allows for a broader and more diverse exchange of materials, teaching methods, and resources. A study by Altbach and Knight (2007) demonstrates that global collaboration in education can improve the quality of teaching and research by facilitating the exchange of knowledge and best practices. Additionally, technologies such as video conferencing and cloud-based collaboration tools enable interaction and cooperation between teachers and students from different countries on cross-cultural projects. As a result, global collaboration facilitated by digital technology enriches students' learning experiences and broadens their understanding of the Indonesian language and culture.

Moreover, the use of technology that captures students' interest significantly enhances their motivation to learn. The advent of digital technology has introduced a multitude of tools and applications that can make language learning more interactive and enjoyable. For instance, the incorporation of gamification in applications like Duolingo makes learning Indonesian more engaging by introducing virtual challenges, points, and rewards. Research by Hasan et al. (2019) indicates that gamification can effectively increase students' motivation and engagement in the learning process. Additionally, technologies such as Virtual Reality (VR) and Augmented Reality (AR) offer immersive learning experiences, allowing students to understand language usage within realistic contexts. This

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approach not only deepens their comprehension of the language but also fosters a greater interest and enthusiasm for learning.

The usage of digital technology in the field of Indonesian Foreign Speakers (BIPA) has shown serious changes in the methods of education. The e-learning, social media, and artificial intelligence technologies increase accessibility and flexibility, hence raising the interactivity of the learning process. Moreover, teaching methods like blended learning, gamification, and the use of virtual reality (VR) and augmented reality (AR) technologies have made students' learning experiences more interactive. On one side, challenges of limited access to technology and low digital literacy of teachers and students may exist, while on the other, there are a substantial number of opportunities for innovation and global collaborative work.

Thus, the results reveal that there are extensive opportunities for improving the effectiveness of BIPA learning with the help of digital technology. In this context, e-learning resources and digital platforms enable students access to learning materials at any time and place convenient to them, thereby supporting self-directed learning. The enhancement of such learning with the help of social media and learning apps could easily be achieved by increased motivation and engagement of the students. Technologies like AI and machine learning made this possible in material developed specifically according to individual needs, which brought more personalized and effective feedback.

This does not relate to but bears on the research question since these show the ability of digital technology not only to make learning methods

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more advanced but also to make it possible to have better learning outcomes. Using technologies like VR and AR helps students understand better the cultural background and language use in genuine situations, hence increasing understanding and competency in Indonesian.

The findings derived from this study converge with some of the earlier research work in showing that digital technology can enhance motivation and engagement in language learning among students (Bazylev & Dutko, 2020, 2020; Chen & Lin, 2016; Laura-De La Cruz et al., 2022). Yet, the study contributes more to the topic being dealt with by emphasizing language teaching, which has not been much focused upon in preceding literature. One such study done by Cheng & Yang (2021) on the use of AI in language learning came up with findings that this technology can provide personalized, adaptive feedback, which also proves effective in the context of BIPA.

Differences from prior research can be traced back mainly to the specific interest in BIPA within Indonesia, which is culturally and linguistically different. In addition, the difference in access to technology and digital literacy across countries might have an impact on differences in results from the study.

Theoretical Implications

In that way, these research results make an important contribution to the progress of the theory of learning languages with the help of digital technology, especially in the context of teaching Indonesian as a Foreign Language (BIPA). In this respect, it stresses the realization that pedagogical approaches should use technology to increase accessibility, flexibility, and

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effectiveness of learning. Conventional language learning theories have largely favored face-to-face instruction and textbooks. With the emergence of technology, the paradigm of language learning has become more dynamic and interactive.

This confirms first of all that digital technology could indeed widen the accessibility of language learning. E-learning platforms, like Moodle and Google Classroom, make it possible for students coming from different geographical locations to have access to learning materials. The results resonated with the theory of connectivism, which stresses networks and connections in the process of learning as one of the important components in knowledge management and learning efficacy (Al Maawali, 2022; Amakhina et al., 2023; Velarde-Molina et al., 2023). Improving accessibility would give the students a chance to learn at their convenience, hence adding value and creating flexibility and opportunities for learning.

Other than that, it also supports the theory of social constructivism, which states that social interaction is very crucial in the process of learning. Through social media and interactive learning applications, a student can communicate with others so that they share what they know within a virtual platform. These interactions not only help students understand their learning but also improve their communication and collaboration skills. Kateryna et al. (2020) postulated that learning takes place in a social context, and digital technology provides an ideal platform on which to realize the realization of this theory.

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Further, the current study shows a serious regard for artificial intelligence and machine learning that have been adopted in developing adaptive and personalized learning materials. In the light of adaptive learning theory, AI can be applied in the analysis of students' learning data to establish both their weaknesses and strengths, and thereafter tailor feedback on that basis. This is similar to Vygotsky's Zone of Proximal Development (ZPD) theory, wherein AI provides the means of "scaffolding" by which students are optimally developed through support specifically customized to their individual needs (Fani & Ghaemi, 2011). For example, AI programs could provide practice for students in areas where they are weak, while also giving more advanced problems in areas where a student shows strength.

This study also supports different studies related to the area of gamification in language learning. The application of game elements, such as points, levels, and challenges, has proved in the past to increase student motivation and engagement. This will back the theory of intrinsic motivation suggested by Demirbilek (2023) that game elements motivate students to learn in an interesting and challenging way. Moreover, gamification goes well with the self-determination theory, which states students' motivation is increased once they feel competent, autonomous, and related to other individuals.

Practical Implications

Several strategic recommendations at the practical level emerge from these research findings to enhance improvements in Indonesian language learning for foreign speakers in BIPA programs employing digital technology

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applications. It is recommended that teachers make use of e-learning platforms like Moodle and Google Classroom to give online learning materials. These platforms are good for learning and distributing materials as well as assisting teachers in tracking progress, providing real-time feedback, and creating online discussions. Moodle enables the teacher to design interactive courses with quizzes, discussion boards, and structured assignments. Google Classroom, together with Google productivity tools, helps in sharing and communication between the teacher and students. The teaching has become flexible with these e-learning platforms, as the students can access them even from different parts of the country.

Besides, language learning applications like Duolingo and Babbel, combined with the use of social media such as Instagram, YouTube, and TikTok, can increase student engagement and motivation. Learning applications provide interactive activities that offer practice and exercise for a vast range of language skills, while social media will offer visual and audio material that is challenging and relevant to day-to-day life. One can use Instagram to spread new words or idioms by simply putting them in a picture or short video. One can post an explanation about grammar on YouTube or an example of everyday speech. And on TikTok, an educator can create educative and entertaining content quickly and in a very convenient format of short videos. To this end, such integration of social media and apps into learning would make learning more dynamic and bring learning to par with the current technological turn.

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It is also suggested to utilize Virtual Reality and Augmented Reality technologies, which help in creating more engaging and contextualized learning. The use of VR technology will allow the student to explore virtual environments modeled after realistic situations in Indonesia: traditional markets, tourist destinations, and social situations. This is going to be helpful for students because they will see firsthand how language is used in a real and practical environment. On the other hand, AR can also be used in offering additional information or vocabulary translation while interacting with physical objects in the real world with students. In this view, AR applications could show the definitions and/or the use of words whenever the student scans some objects with the application. The use of both VR and AR in BIPA learning will make the process more interesting and help students master the language more excitingly and amusingly.

In addition, training programs and digital skills must be developed for teachers and students to best utilize the technology. This would require that teachers be trained on how to use e-learning platforms, learning apps, and technologies that provide immersive experiences. Training in this should be technical and pedagogical to facilitate the teachers in applying it in their design of effective teaching methods by using digital technologies. Similarly, the students need to be oriented toward how best these technologies can be used to aid their learning processes. Better digital literacy both from the teachers and students themselves would help ensure that technology works at its best to improve learning outcomes.

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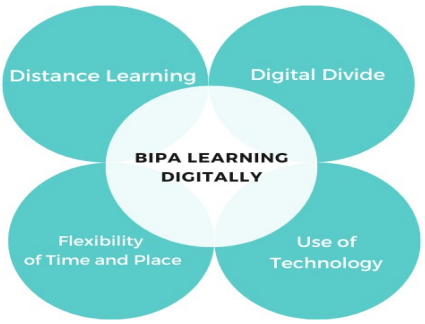
The provision of a powerful technological infrastructure should be put in place to roll out the use of digital technologies for educational institutions implementing BIPA programs. This will include the provision of hardware such as computers, tablets, and virtual reality headsets, in addition to high-speed and reliable internet access. A BIPA program can make the best out of digital technology and embrace more flexible, interactive, and effective learning only with adequate technical support ensured for both teachers and students. By incorporating all these recommendations, a BIPA program may effectively use digital technology and explore more flexibly with interactions and effectiveness in learning. This will not only make teaching more effective and students' learning achievement higher, but it will also foster the promotion of Indonesian languages and culture on an international scale.

Picture 1. Chart of factors that greatly influence digital BIPA learning



The chart above shows several factors that influence BIPA learning, there are 4 factors that really influence digital BIPA learning, namely:

1. Distance Learning

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Distance learning makes it easier for students who want to take part in learning but are hampered by long distances, but with digital BIPA learning, they can still take part in learning activities.

2. Flexibility of Time and Place

   Learners can study anytime and anywhere according to their convenience and schedule.

3. Digital Divide

   Digital divide of BIPA learning refers to differences in access, abilities and quality of learning experiences experienced by BIPA students due to differences in technology, infrastructure and resources.

4. Use of Technology

   Digital learning of Indonesian for Foreign Speakers (BIPA) has experienced rapid development. The use of technology in learning not only facilitates access, but also improves the quality and effectiveness of learning

CONCLUSION

This research shows that e-learning platforms, such as Moodle and Google Classroom, which enable the distribution of learning materials on the internet, have indeed made it possible for students to learn at their convenience without being bound by time and place. These are some of how apps like Duolingo, Babbel, or more social-media-oriented platforms, such as Instagram, YouTube, and TikTok, help make content more interactive for students. With the integration of VR and AR technologies into the platforms, the learning environment becomes even more immersive and contextual. Students can understand how language is used in its authentic scenario.

This study theoretically affirms the arguments of connectivism and social constructivism that emphasize the relevance of social networks and interaction to the process of learning. Further, the current findings are in

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agreement with the principles postulated by adaptive learning theory, which argues that artificial intelligence through machine learning is a technique that can help students provide feedback tailored to the learner's needs to drive these tutees toward achieving their potential in academics. In addition, it has been demonstrated that gamification in language learning corresponds to the assumptions of both intrinsic motivation and self-determination theories, in which such approaches allow for deeper student engagement and motivation. Practically, this research provides a guideline on how an effective strategic integrated way of leveraging digital technology can be undertaken in language learning programs. This includes e-learning platforms, language learning applications, and social media to create a dynamic learning environment in anticipation of technology development for the integration of VR and AR technologies to provide an immersive and contextualized experience. In addition to this, it is very important to introduce the training program and development of digital skills among the teachers and students for the best utilization of the technology. In conclusion, educational institutions must establish a robust technological infrastructure and provide comprehensive technical support to facilitate the integration of digital technologies. By adopting these recommendations, BIPA programs can enhance the quality of instruction and student learning outcomes, while also promoting the Indonesian language and culture on an international scale.

Therefore, this study can only be seen as the foundation for the much more flexible and effective development of BIPA pedagogy in this digital era. Moreover, it uncovers other aspects that need to be researched regarding the

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implementation of digital technology on diverse language learning landscapes. With further development and eventual application of new technological solutions, the quality and efficiency of the BIPA programme would continue to be ever-improving in the future.

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