



Web-based Indonesian for Foreign Speakers (BIPA) Learning to Improve Arabic Students' Language Skills

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ABSTRACT

This study examines the role of web-based learning in Indonesian for foreign speakers (BIPA) learning as an effort to increase the language skills of Arabic Language Education students at Universitas Pendidikan Indonesia. The research departs from the description of the problem observed by the researchers in teaching BIPA to Arabic Language Education students at UPI in the BIPA course. The aims of this research are 1) to know the role of the web in BIPA learning for Arabic students and 2) to investigate the efforts to improve the students' language skills through such learning. This study employed a qualitative approach. Data were collected through observation, interviews, questionnaires, and documentation. The results showed that the web-based BIPA learning materials were developed to assist the students' learning process in a more engaging and interactive way. The results also revealed that the contents were formulated in various forms to increase the students' language skills because of the development of a website-based BIPA learning model.

Keywords: *Arabic language learning, Indonesian for foreign speakers (BIPA), Language skills, Website-based learning model.*

1. INTRODUCTION

Reviewing foreign language skill has become commonplace that the foreign language that needs to be mastered is limited to the scope of five international languages recognized by the United Nations. Handoko (2019) provides a view that many languages have an important role important in weaving connections through some fields, such as Indonesian, and potentially becoming an international language. As represented in Masraeng (2015), the United Nations currently strengthen the identity of Indonesian through the deployment of Indonesia, the establishment of centers for learning Indonesian overseas, transmission of Indonesian ambassadors overseas, development of works with language institutions in international level, as well as accompaniment of teaching Indonesian for speaker foreign (BIPA).

In harmony with that, this requires the important role of youth learning Indonesian to be interested in making the language an international language and the main language to gain knowledge in the era of globalization (Amrizal, 2019; Rohimah, 2018). A language can be said qualified and becomes a language international if it fulfills intralingual and extra lingual factors, and

Indonesian has been encouraged toward such goal (Widodo, 2022).

The introduction of Indonesian language through teaching BIPA is currently being concerned by intellectuals in Indonesia. The reason is that Indonesian experiences quite significant development, visible from the number of Indonesian learners (Sari & Murdiono, 2021). BIPA is also mandated to be learned for students in various higher education, especially foreign language students. Based on the data obtained from the study of Rohayani (2014), there are at least 72 countries that offer Indonesian Language to be learned, including Germany, Morocco, Australia, Poland, and Thailand. Internationalization of Indonesian language is also clarified in Regulation Government Number 57 of 2014 namely to show teak self and improve Indonesian competitiveness.

Learning activity naturally needs media so that the materials presented can be received well by the learners. Fadillah, Bilda, Saleh, and Yenni (2021) mention that with the existence of media in the learning process, the learning process will become more interactive, efficient in time and energy, and qualified for the students'

learning outcomes. Learning media become an important element in achieving the competence.

Especially in the era of technology 4.0 like now, the teacher is required to be more creative in bringing materials so that the knowledge gained by the learners could be absorbed well. One of the media that can be utilized is a website. Web-based learning media can give flexibility to learners for increasing understanding and skills of the materials (Pratomo & Irawan, 2015). Learning media is very crucial to make it easy to deliver the contents and meaning from communication as a part of learning (Mar'ah, Rusilowati, & Sumarni, 2020).

Web-based learning is not limited to certain subject and specific knowledge. The example is discovering something from certain subject which has been known previously through the usual media called Google. Especially for language subject, nowadays there has been many website-based media that provides materials and things which is easy for learners who learn foreign language (Kustini, Herlinawati, & Indrasary, 2020). Another study was conducted by Yulianeta, Yaacob, and Lubis (2022) where web-based teaching materials could help Indonesian language for foreign speakers (BIPA) students to learn Indonesian cultures through Indonesian folklores integrated into the web-based materials. Identified web role in implementation study of BIPA learning has been facilitated by the Ministry of Education and Culture of the Republic of Indonesia. Likewise, with the UPI FPBS Arabic Study Program in its BIPA learning optimized website.

Considering the important role of media-based technology learning in enhancing students' knowledge including in language learning, the researchers want to know the role of the web in Arabic BIPA learning and the effort to enhance the language skills of UPI Arabic Language Education students through the web-based learning media for Arabic BIPA learning.

2. LITERATURE REVIEW

Indonesian Language Program for Foreign Speaker is a program designed for foreigners in learning Indonesian language with culture (Okitasari, 2019) BIPA's role naturally is to improve the function of speaking Indonesian language which is not only as a national language but also become an international language and fulfill the needs of foreigner workers in the Indonesian language training program (Kurniasih & Isnaniah, 2019; Sapanti, 2021).

Debriefing for students continue to be carried out through seminars and training. Since 2019, the Arabic Language Study Program of FPBS has also conducted debriefing in BIPA lectures with the main objective of Arabic speakers. Besides a teacher, this Arabic BIPA program becomes a challenge as well as new opportunity for content creators in the development of required

teaching materials. Students must hone Skills addition in support of BIPA learning (Jatmiko, 2021; Sapanti, 2021).

In answering the challenge, the students should prepare skills to speak Arabic. Arabic language skills usually learn four *maharah* (skills) such as *maharah muhadatsah* (speaking), *kitabah* (writing), *maharah qiro'ah* (reading), and *istima'* (listening) (Salsabila, 2021). Efforts to acquire those skills are strongly influences by the learning media used (Chafidzoh, 2020). Rumahorbo (2020) chose web media to be an interesting and innovative breakthrough in learning in this era. This thing can use anytime and anywhere for suitable needs learning. Next, by learning this web-based presentation instruction from the teacher or lecturer refers to using internet technology (Abdillah, 2021).

3. METHODS

This study uses a qualitative descriptive study because the researcher focuses on the experiences or processes of students during Arabic BIPA learning and efforts to improve their Arabic proficiency with the target of BIPA students from foreign speakers. This design aims to understand the meaning and essence of web-based Arabic BIPA learning. Sources of data were obtained from students in third semester and BIPA lecturers at UPI Arabic Language Education Study Program. The data collection techniques were carried out through interviews, observation with Participant Observation, data collection, closed questionnaires and primary documentation studies. Then, the data was analysed by using induction qualitative and the results of the qualitative study has more emphasized meaning than generalizations.

4. FINDINGS AND DISCUSSION

The Arabic BIPA course provides different feeling of learning. Learning web-based with results product development teaching materials agreed with lecturers and students. With thereby web serving is one of the presenter instructions lecturers who teach. Besides that, the target of BIPA learners from Arabic speakers requires effort enhancement skills proficiency in Arabic for student as candidate teacher and or content creator.

4.1. The Role of the Web in Learning BIPA for Arabic Major Students at the UPI Arabic Language Education Program

4.1.1. The Web Interface of BIPA Learning at Arabic Education Study Program UPI

Figure 1 show the website used during Indonesian language learning for foreign speakers with target learner Arabic speakers.

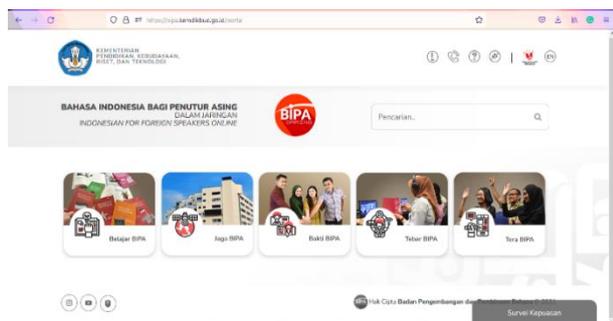


Figure 1 BIPA online website by the Ministry of Education, Culture, Research, and Technology.

The selection of this web media is very interesting and innovative. Suite instructions teachers are already served through internet technology. Further (Abdillah, 2021) looks at web-based learning on aspects of *pedagogical*. BIPA’s website refers to *a pedagogical framework* that includes teaching and learning. Dimension discussed related problems with analysis content, analysis audience, analysis objectives, media analysis, approach design, organization, and strategy learning.

There are various menus on the website, 1) Learning BIPA, providing materials BIPA learning is available in the forms of books, materials enrichment, and materials exercise. 2) Take care of BIPA, networks, and institutions BIPA providers around the world. 3) BIPA service, sundries BIPA gait in the form of creating scientific and news assignments. 4) Spread BIPA places BIPA online learning. 5) Tera BIPA, BIPA online test for test placement and test evaluation to learn BIPA.

4.1.2. Web-Based BIPA Learning Materials at Arabic Education Study Program UPI

Materials play an important role in delivering learning to its goals (Kapur, 2020). Like be delivered previously in the BIPA Online menu there is Learn BIPA which provides BIPA teaching materials, materials enrichment, and materials evaluation (see Figure 2).

“This book is very complex, for all level learners. Inside is also very has supporting speaking skill including the audio. Very interesting to our share for learners from the middle east.”

Tomlinson (2016) amplifies the development of teaching materials for learning language already should load teaching materials skills and efforts instructional in the increase. Next, the BIPA teaching materials themselves served gradually in acquisition skills speak. Lecturer Arabic BIPA teacher added:

“BIPA teaching materials, a good book or sheet Standard Competence Graduates (SKL) are very helping for students’ literacy. and offering new challenge for serving it in Arabic language with payload of Indonesian culture.”

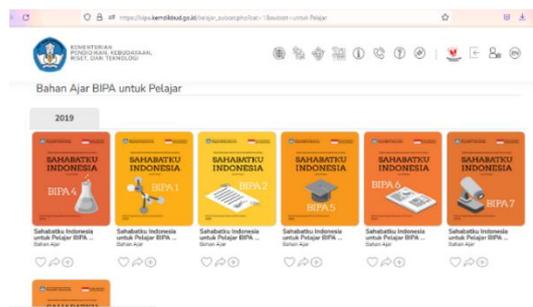


Figure 2 Online BIPA learning materials in the website.

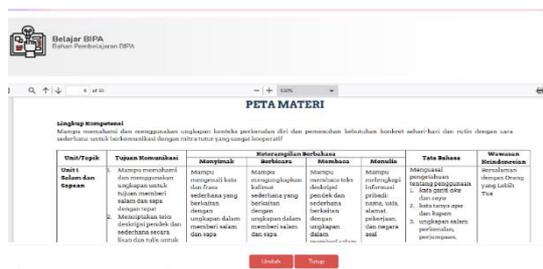


Figure 3 The map of learning materials in Sahabatku Indonesia BIPA 1.

As shown in Figure 3, each material has learning skills, whether listening skills, speaking skills, reading skills as well as writing skills. These skills are very important in learning a language regularly intact by presenting the whole skills (Rahmawati, Nurlianharkah, Hasanudin, & Fadlillah, 2021). Moreover again approach culture will make the learners increasingly interested in the language foreign that they studied.

4.2. Efforts to Enhance Skills of Arabic Students through Web-based Arabic BIPA learning at UPI Arabic Education Study Program

4.2.1. Learning Process of Arabic BIPA students in UPI Arabic Education Study Program

Pedagogical aspect becomes the framework in this website-based Arabic BIPA learning (Fadillah, et al., 2021). The main target is to manage teaching and learning. The online BIPA website is the main base of learning implementation. Lecturers explain:

“Website becomes guide to learns. The students are involved in project-based learning. All BIPA materials are in Indonesian language while our goal is for learners from the middle-east, Arabic native speakers. Language aspect has also been provided Sahabatku Indonesia. However, we want to continue to present a more interesting and authentic cultural scene from Indonesia,”

Furthermore, the students are equipped with deepening the Arabic BIPA concept that focuses on language and culture. Approach culture makes learning Becomes more interesting and closer (Sari & Murdiono,

2021). Likewise, Indonesia will also appear real for Arabic-speaking BIPA learners. Students learn BIPA's teaching materials, reading, studying, selecting, and translating the material. The students explain:

"We choose this project-based learning as well as web-based learning theory from the web online group for making a learning video. Language and culture must deliver on the selected material. We also study selected teaching materials until translating it to make understand the learners from the middle-east country."

Student activities during the web-based Arabic BIPA learning process consist of 1) Accessing the online BIPA website, as a reference in getting instructions lecturer delivered through internet technology that can be used without limitation of space and time. 2) Forming team project, lecturers' direction to produce group project in the form of learning videos. Group project has a good influence in achieving learning goals and building creativity (Rati, Kusmaryanti, & Rediani, 2017). 3) Reading and exploring BIPA material online, which material is important. Cultural integration in language theory has a role in the internationalization of the Indonesian language. 4) Produce Arabic BIPA design in the team project. After the selection, Indonesian language material needs to be translated so the Arabic speakers will understand. This activity is what students demand in efforts to enhance language skills, in the process of translation (Al-Jubori & Al-Talqani, 2019).

4.2.2. Design of Arabic BIPA Teaching Materials Student at UPI Arabic Education Study Program

After the selection of teaching materials from the team project of BIPA Online website, the students make the design to create a shared Arabic BIPA teaching video through social media (online).

Study video design prepared by the team project with adaptation theory from the BIPA Online website. Then, the special theme of Indonesian "The Highest Mountain in West Java" is served with the material in appropriate language level (see Figure 4). In learning, we must determine the goals and objectives to be directed. From the information above, the team determines competence for disclosing feelings by simply describing the environment and activities every day. This thing shows that the team project has had a clear goal in the learning video that will be produced. Besides it's also a chosen title or related themes with Indonesian nature will increase readers interest (Kristin, 2015; Rumahorbo, 2021).

In the narrative prepared by the team, it appears the usage of Indonesian and Arabic in one segment. This marks the team helping middle eastern learners to understand Indonesian lessons in videos. Besides that, for students in the process of improving their skills in Arabic,



Figure 4 Narrative and video of learning media for Arabic BIPA program with title of the highest mountain in West Java.

the team is also trying to do literacy and translation. On the other hand, the skill of writing or writing Arabic books does not immediately become an exercise for them. They can search for closest word matches in grammar, phrases, and stories. Arabic BIPA learning has pushed the students to increase their skills to speak regularly and continuously in method of narrative translate (Nugraha, Farhah, Anis, Arummi, & Hidayati, 2022; Perdana, 2017). In addition, the student mentions:

"During making the design of video narration we also try to translate it. Then, when video production starts we practice spelling all narration both in Indonesian Language and Arabic language. We try to spell well so it will be understood by Arabic speakers."

For complete learning video design, students' team project is sorting and selecting photos and audio media to insert into the videos. Recording narration in two languages is also included. The learning videos is also showing photo, audio, and recording narrative that contains language theory, and culture. Audio-visual teaching materials as such are very interesting to grab the attention of the learners so it capable to deliver the learning goals. Besides that, team projects train the students as a tutor or teachers of BIPA for foreign speakers in which require them to speak Arabic too. Students strive to serve the theory with Arabic so their speaking skills continuously being trained and increase.

4.2.3. Video of Arabic BIPA Learning by Students in the UPI Arabic Language Education Program

At this step, the BIPA material that has been selected from the BIPA online website is interpreted in a BIPA learning video for Arabic speakers or learners. A bilingual service with a special Indonesian theme is presented by the student project team (see Figure 5).

In accordance with the project team plan, this learning video contains audio and images. Bilingual narration is also included in the video. The project team students who



Figure 5 A sample of BIPA learning video.



Figure 6 Some parts of the BIPA learning video materials at Arabic Language Education Study Program.

packaged the video feed became more interested in the Indonesian integration theme. The pedagogical aspect is seen in the teaching and learning design. Efforts to improve students' Arabic skills are often carried out, including at every level of making learning videos.

In every question always use double language, Indonesian and Arabic (see Figure 6). The typical Indonesian look with a mountain theme is presented very dancing in a mix of images and sounds. Pronunciation is also exemplified in each material vocabulary and strengthened by matching Arabic words. The language of the material is delivered with examples in two languages as well. Efforts to improve Arabic language skills for students are carried out regularly on an ongoing basis starting from planning teaching materials to making BIPA Arabic learning videos.

5. CONCLUSION

Along with the development of the era of amplification of Indonesian language skills which are very important as part of international relations, they are now starting to be known and disseminated throughout the world. The BIPA program aims to be present as a new spirit in the internationalization of the Arabic language, including to Middle Eastern countries. Arabic Language Education students are given new challenges and opportunities in teaching BIPA for Arabic speakers. Website-based learning that utilizes internet technology is used as a medium. By answering the challenges above,

students can improve their Arabic language skills in making Arabic BIPA learning videos together on social media. The contents of the video loading material on Indonesian language and culture are presented in two languages, Indonesian and Arabic. With this research, it is hoped that it can contribute to the development of web-based BIPA learning, especially Arabic learning. In the future, the BIPA web is expected to develop more in all aspects.

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REFERENCES

- Abdillah, L. A. (2021). Web-based learning. In E. Sudarmanto et al. (Eds.), *Model pembelajaran era society 5.0* (p. 60-84). Insania.
- Al-Jubori, G. M., & Al-Talqani, M. H. (2019). The role of language skills in enhancing translators' performance in sight translation: A case study. *Journal of Language Studies*, 2(3), 33-59.
- Amrizal, A. W. (2019). Kesetaraan Bahasa Indonesia dan Bahasa Inggris sebagai penghela ilmu pengetahuan di era globalisasi [Equality of Indonesian and English as a driver of knowledge in the era of globalization]. *INA-Rxiv Papers*. <https://doi.org/10.31227/osf.io/yk3zt>
- Chafidzoh, T. F. (2020). Strategi meningkatkan pemerolehan bahasa Arab dengan memperhatikan tipe kepribadian siswa [Strategies to improve Arabic language acquisition by paying attention to the personality type of students]. *Al-Ma 'rifah*, 17(1), 48-57.
- Fadillah, A., Bilda, W., Saleh, H., & Yenni. (2021). Design of interactive learning media in the Covid-19 pandemic time using Ispring. *Prima: Jurnal Pendidikan Matematika*, 5(1), 1-10.
- Handoko, M. P. (2019). Potensi pengembangan bahasa Indonesia menjadi bahasa internasional [Potential development of Indonesian into an international language]. *Jurnal Bahasa Indonesia bagi Penutur Asing*, 1(1), 22-29. <https://doi.org/10.26499/JBIPA.V1I1.1629>
- Jatmiko. (2021). *Peluang dan tantangan pengajaran BIPA untuk penutur Bahasa Arab [Opportunities and challenges of teaching BIPA for Arabic speakers]*. Universitas Islam Indonesia. Retrieved 2022, from <https://www.uii.ac.id/peluang-dan->

[tantangan-pengajaran-bipa-untuk-penutur-bahasa-arab/](#)

- Kapur, R. (2020). *Teaching-learning materials: Significant in facilitating the teaching-learning processes*. Retrieved from https://www.researchgate.net/publication/345412998_Teaching-Learning_Materials_Significant_in_Facilitating_the_Teaching-Learning_Processes
- Kristin, F. (2015). Keefektifan model pembelajaran berbasis budaya (PBB) untuk meningkatkan hasil belajar IPS [The effectiveness of the culture-based learning model (PBB) to improve social studies learning outcomes]. *Scholaria Jurnal Pendidikan dan Kebudayaan*, 5(2), 46-55.
- Kurniasih, D., & Isnaniah, S. (2019). Penerapan bahan ajar bahasa Indonesia bagi penutur asing (BIPA) "Sahabatku Indonesia" tingkat dasar di IAIN Surakarta [Application of Indonesian language teaching materials for foreign speakers (BIPA) "Indonesia, my friend" at the elementary level at IAIN Surakarta]. *Jurnal Bahasa Indonesia bagi Penutur Asing (JBIPA)*, 1(2), 62-71. <https://doi.org/10.26499/jbipa.v1i2.1793>
- Kustini, S., Herlinawati, & Indrasary, Y. (2020). Penggunaan teknologi dalam pembelajaran Bahasa Inggris untuk meningkatkan keterampilan multiliterasi [Penggunaan teknologi dalam pembelajaran Bahasa Inggris untuk meningkatkan keterampilan multiliterasi]. *Intekna*, 20(2), 85-94.
- Mar'ah, N. K., Rusilowati, A., & Sumarni, W. (2020). Perubahan proses pembelajaran daring pada siswa Sekolah Dasar di tengah pandemi Covid-19 [Changes in the online learning process for elementary school students in the midst of the Covid-19 pandemic]. In *Prosiding Seminar Nasional Pascasarjana (PROSNAMPAS)* (Vol. 3, No. 1, pp. 445-452).
- Masraeng, R. (2015). Diplomasi bahasa menjembatani keragaman bahasa daerah dan pengutamaan Bahasa Indonesia [Language diplomacy bridges the diversity of regional languages and prioritization of Indonesian]. *RETORIKA: Jurnal Ilmu Bahasa*, 1(1), 155-167.
- Nugraha, R. S., Farhah, E., Anis, M. Y., Arummi, A., & Hidayati, T. Y. N. (2022). Pelatihan penyuntingan teks sastra terjemahan Arab-Indonesia bagi siswa MAN 1 Karanganyar Jawa Tengah [Arabic-Indonesian translation literary text editing training for MAN 1 Karanganyar students, Central Java]. *Adi Widya: Jurnal Pengabdian Masyarakat*, 6(1), 58-68. <https://doi.org/10.33061/awpm.v6i1.6655>
- Okitasari, I. (2019). Evaluasi laporan pelaksanaan tugas tenaga pengajar BIPA wilayah ASEAN 2 masa tugas 2015-2018 [Evaluation of the report on the implementation of the duties of BIPA teaching staff in the ASEAN region 2 for the 2015-2018 period]. *Jurnal Bahasa Indonesia bagi Penutur Asing (JBIPA)*, 1(2), 89-96. <https://doi.org/10.26499/jbipa.v1i2.1874>
- Perdana, D. H. (2017). Strategi penerjemahan bahasa Arab yang berterima dan mudah dipahami [Acceptable and easy-to-understand Arabic translation strategies]. *Jurnal Bahasa Lingua Scientia*, 9(1), 143-160. <https://doi.org/10.21274/lj.2017.9.1.143-160>
- Pratomo, A., & Irawan, A. (2015). Pengembangan media pembelajaran interaktif berbasis web menggunakan metode Hannafin dan Peck [Development of web-based interactive learning media using the Hannafin and Peck method]. *POSITIF – Jurnal Sistem dan Teknologi Informasi*, 1(1), 14-28.
- Rahmawati, I. Y., Nurlianharkah, R., Hasanudin, C., & Fadlillah, M. (2021). Aktualisasi whole language sebagai pendekatan pembelajaran bahasa pada anak usia dini [Whole language actualization as an approach to language learning in early childhood]. *Jurnal Pendidikan Edutama (JPE)*, 8(2), 49-60. <http://dx.doi.org/10.30734/jpe.v8i2.1797>
- Rati, N. W., Kusmaryanti, N., & Rediani, N. (2017). Model pembelajaran berbasis proyek, kreativitas dan hasil belajar mahasiswa [Project-based learning model, creativity and student learning outcomes]. *Jurnal Pendidikan Indonesia*, 6(1), 60-71. <https://doi.org/10.23887/jpi-undiksha.v6i1.9059>
- Rohayani, N. (2014). Penggunaan kartu data pada pembelajaran kosakata berafiks dalam keterampilan menulis BIPA tingkat dasar [The use of data cards in affixed vocabulary learning in basic BIPA writing skills]. *Bahtera Bahasa: Antologi Pendidikan Bahasa dan Sastra Indonesia*, 2, 1-9.
- Rohimah, D. F. (2018). Internasionalisasi Bahasa Indonesia dan internalisasi budaya Indonesia melalui Bahasa Indonesia Bagi Penutur Asing (BIPA) [Internationalization of Indonesian Language and internalization of Indonesian culture through Indonesian for Foreign Speakers (BIPA)]. *An-Nas: Jurnal Humaniora*, 2(2), 11-19. <https://doi.org/10.36840/an-nas.v2i2.104>
- Rumahorbo, N. (2021). Media E-Learning Berbasis Web Sebagai Pembelajaran Bahasa Indonesia Yang Inovatif Revolusi Industri 4.0 [Web-based E-learning media as an innovative Indonesian language learning in Industrial Revolution 4.0].

- In *Prosiding Seminar Nasional Pembelajaran Bahasa dan Sastra Indonesia (SemNas PBSI)-3* (pp. 51-54). FBS Unimed Press.
- Salsabila, U. H. (2021). Peran orang tua dalam penggunaan teknologi pada pembelajaran online tingkat SD di masa pandemi Covid-19 [The role of parents in the use of technology in elementary level online learning during the Covid-19 pandemic]. *Jurnal Inovasi Penelitian*, 8(9), 1717–1718.
- Sapanti. (2021). *Sastra Indonesia UAD dorong mahasiswa jadi pengajar BIPA [Indonesian literature UAD encourages students to become BIPA teachers]*. Lembaga Layanan Pendidikan Tinggi Wilayah V Yogyakarta. Retrieved 2022, from <https://lldikti5.kemdikbud.go.id>
- Sari, D. R., & Murdiono, M. (2021, October). Culture-Based Education Improves National Insight. In *ISTED 2021: Proceedings of the 1st International Seminar on Teacher Training and Education, ISTED 2021, 17-18 July 2021, Purwokerto, Indonesia* (p. 302). European Alliance for Innovation.
- Tomlinson, B. (2016). The importance of materials development for language learning. In *Issues in materials development* (pp. 1-9). Brill. https://doi.org/10.1007/978-94-6300-432-9_1
- Widodo, S. (2022). *Bahasa Indonesia menuju bahasa internasional [Indonesian to international language]*. Badan Pengembangan dan Pembinaan Bahasa. Retrieved 2022, from <https://badanbahasa.kemdikbud.go.id/lamanbahasa/content/bahasa-indonesia-menuju-bahasa-internasional>
- Yulianeta, Yaacob, A., & Lubis, A. H. (2022). The development of web-based teaching materials integrated with Indonesian folklore for Indonesian language for foreign speakers students. *International Journal of Language Education*, 6(1), 46-62. <https://doi.org/10.26858/ijole.v6i1.22957>

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