IJOMER
(Indonesian Journal of Multidisciplinary Educational Research)
P-ISSN: 2987-7601 E-ISSN: 2987-0968
https://jurnalfaktarbiyah.iainkediri.ac.id/index.php/ijomer
DOI: https://doi.org/10.30762/ijomer.v2i2.3607

Developing E-dictionary based on MIT App Inventor for Preschool Students

*** Abdillah Mursyid** [1]
SMK TI CIT Manahilul Ilmi Boarding School, Bogor, Indonesia
* Email: abdisuperior@gmail.com

Sakala Stanley [2]
Literature and Language Department, Petauke Boarding Secondary School, Zambia
Email: stanley4sakala@gmail.com

(*) Email Correspondent: abdisuperior@gmail.com

Abstract

Living in a technologically driven world, students are affected by the latest technological products since they have not been a student yet. Thus, as a teacher we are demanded to be wise and aware in selecting media to deliver our materials in teaching. We should understand that our students now are millennials and they use digital technology in their daily lives. This current study intended to develop E-Dictionary based on MIT App Invertor in teaching English vocabulary for preschool students. In developing the product this study adapted the R& D model from Borg and Gall. They are seven steps prosecuted in this present study: (1) Need analysis, (2) Media Development, (3) Expert Validation, (4) Revision, (5) try Out, (6) Second Revision, and the last (7) is Final Product. The final product was E-dictionary with supporting facilities such as the pictures, sounds, quizzes, reminders, etc. This project appears to help teachers convey English instructions in ease during the teaching learning process. The result suggest that E-dictionary developed impact positively to the teacher as well as the students.

Keywords: E-dictionary, preschool, research and development, vocabulary

Received:	30-08-2024	Revised:	23-10-2024	Accepted:	30-10-2024

INTRODUCTION

In the rapidly evolving digital era, the integration of technology into early childhood education has become an essential component in fostering young learners' growth (Isikoglu et al., 2019; Li & Chu, 2021; Linberg et al., 2019). Preschool years are crucial for cognitive, linguistic, and social development, as children begin to explore and interact with the world around them. The challenge lies in creating educational tools that not only cater to their developmental needs but also captivate their natural curiosity and enthusiasm such as digital playing tool for education (Gleason & Von Gillern, 2018; Lawrence, 2018; Magnusson, 2021; Rulyansah et al.,2023). One such tool gaining attention is the e-dictionary—a digital learning aid that supports language acquisition, vocabulary expansion, and comprehension. By leveraging platforms like MIT App Inventor, educators and developers can create interactive and engaging e-dictionaries tailored specifically for preschool students.

Language development is a foundational skill for preschool students, providing them with the means to express their thoughts, understand others, and build social connections. Traditionally, physical picture dictionaries have been employed in early education to introduce basic words and concepts. However, these static resources often lack the interactivity and adaptability that modern learners are accustomed to. As the prevalence of smartphones and tablets increases, even among young children, educational technology offers innovative solutions to enhance learning experiences (Cowan & Flewitt, 2021; Schall-Leckrone, 2018). E-dictionaries, enriched with multimedia elements such as images, sounds, and animations, present an exciting opportunity to modernize early language education (Alharbi, 2016; Amirian & Heshmatifar, 2013; Dashtestani, 2013; Ratminingsih et al., 2022; Rezaei & Davoudi, 2016; Thrinh et al., 2021).

MIT App Inventor, a user-friendly platform for app development, has become an ideal tool for creating educational applications. Designed for beginners with little to no programming experience, this platform provides a visual, block-based coding environment that simplifies the app development process. Its accessibility makes it particularly suitable for educators and researchers aiming to design custom applications without requiring extensive technical expertise. By using MIT App Inventor, developers can incorporate features like voice pronunciation, interactive quizzes, and multimedia content,

ensuring that the e-dictionary aligns with the developmental characteristics of preschool learners.

This article explores the development of an e-dictionary specifically designed for preschool students, utilizing MIT App Inventor as the primary development platform. The objective is to create a tool that not only introduces young children to foundational vocabulary but also enhances their learning experience through engaging, interactive features. The proposed e-dictionary is designed to bridge the gap between traditional learning materials and contemporary digital tools, providing an accessible, effective, and enjoyable way for preschool students to learn new words.

METHOD

Research Design

This study is aimed to develop learning media using MIT App Invertor for Preschool English vocabulary. The process of research and development (R&D) consists of studying research finding pertinent to the product to be developed, developing the product based on the findings, field-testing the product in the setting where it would be used eventually, and revising it to the correct deficiencies found in the field-testing stage.

The model used for this research and development is the ADDIE model. ADDIE model was emerged in 1975 at the University of Florida (Spatioti et al., 2022). ADDIE is an acronym for Analyze, Design, Develop, Implement, and Evaluate. In the ADDIE model, every step has a consequence to the next step. Hovewer, this step involved in this model is not necessarily strict, linear, progression in the steps (Johnson-Barlow & Lehnen, 2021). According to its basic theoretical and philosophical characteristics, the specific model—ADDIE—is widely known and recognized as a model for designing and evaluating learning experiences, courses, and educational content (Trust & Pektas, 2018).

Analysis Phase

A needs analysis is a critical step in the development of any educational resource, serving as the foundation for understanding the requirements and expectations of the target audience. In this project, the needs analysis is conducted to gather all relevant information and insights that inform the development of an e-dictionary tailored specifically for preschool students. This involves collecting data directly from the parents of preschool-aged children, as

they play a central role in guiding and supporting their children's learning journeys. By incorporating parents' perspectives, we ensure that the e-dictionary aligns with the specific needs, preferences, and challenges faced by both children and their families.

To effectively conduct this analysis, we employed questionnaires. Questionnaires allow for broader data collection, capturing the opinions, needs, and expectations of parents regarding the functionalities and features they believe would be most beneficial for their children.

The findings from the needs analysis guide every aspect of the e-dictionary's design and development. They inform decisions on content selection, interface design, and the inclusion of multimedia elements like visuals and audio that cater to preschoolers' cognitive and linguistic capabilities. Ultimately, the needs analysis forms the cornerstone of the project, bridging the gap between theoretical considerations and practical implementation. By placing a strong emphasis on understanding the needs of preschool children and their parents, this stage ensures that the final product is not only educationally sound but also genuinely impactful and user-centric.

Design Phase

The design of the e-dictionary in this project is to support preschool students in improving their vocabulary skills through a combination of engaging features and child-friendly elements. At its core, the e-dictionary serves as an interactive tool that transforms the process of learning new words into an enjoyable and immersive experience. Every design choice is informed by the developmental characteristics of preschoolers, ensuring that the tool is both educationally effective and appealing to its young audience.

One of the key features of the e-dictionary is its use of clear, high-quality pictures accompanied by colorful and vibrant backgrounds. Visuals play a crucial role in capturing the attention of young learners and aiding their comprehension and retention of new vocabulary. The choice of colors and images is intentional, aiming to stimulate curiosity and sustain engagement while ensuring the content remains age-appropriate and non-distracting. Each picture is carefully selected to represent its corresponding word accurately, fostering an intuitive connection between visual stimuli and language acquisition.

To further enhance interactivity, the e-dictionary incorporates auditory feedback. When a picture is touched, the device plays a corresponding sound or pronunciation of the word. This feature helps children associate spoken words

with their visual representations, reinforcing auditory and verbal skills. The inclusion of sound also accommodates different learning styles, particularly for auditory learners who benefit from hearing words pronounced correctly. Additionally, the auditory feature introduces an element of play, which is crucial for maintaining the interest and enthusiasm of preschool learners.

The e-dictionary also integrates interactive quizzes to reinforce learning and assess the child's progress. These quizzes are designed to be simple, engaging, and tailored to the developmental level of preschoolers. They might involve tasks such as matching pictures to words, identifying objects based on spoken clues, or selecting the correct pronunciation of a word. By including quizzes, the e-dictionary transforms passive learning into an active process, encouraging children to recall and apply what they've learned. These activities not only build confidence but also provide opportunities for repetition, which is essential for mastering new vocabulary.

The design also takes into account the usability and accessibility of the application. The interface is intuitive and straightforward, with large, easy-to-navigate buttons and clear instructions to accommodate the limited motor skills and attention spans of young children. The app is designed to be visually uncluttered yet engaging, striking a balance between simplicity and stimulation. Parents and educators can also benefit from features that allow for customization, such as selecting specific vocabulary categories or tracking a child's progress over time.

Development Phase

Developing an e-dictionary tailored for preschool students involves a series of carefully planned steps, each aimed at ensuring the application meets both educational and technical standards. The development process begins with consulting experienced preschool teachers about the content to be included in the e-dictionary. Teachers play a crucial role in this stage as they provide insights into age-appropriate vocabulary, effective teaching strategies, and the needs of preschool learners. Their input ensures that the content is not only relevant but also aligns with developmental milestones and educational goals for this age group.

Following this consultation, a simple yet comprehensive plan for the e-dictionary is crafted using the MIT App Inventor platform. This planning stage involves outlining the app's structure, features, and visual design, all tailored to the cognitive and motor abilities of preschool children. By focusing on simplicity

and engagement, the plan ensures that the app will be intuitive and appealing to its young users.

Once the content has been reviewed and confirmed by the teachers, the next step is to begin the actual development of the application. Using MIT App Inventor, the development team translates the planned features into functional elements, incorporating interactive visuals, auditory feedback, and quizzes. This stage requires close attention to detail to ensure the app functions seamlessly and meets the educational objectives outlined in the initial plan.

After completing the initial development, the app is submitted to experts for validation. Expert judgment is a vital component of the development process, as it provides an external perspective on the app's content, design, and overall educational value. Based on the suggestions and feedback from these experts, the app undergoes revisions to enhance its quality.

Implementation Phase

After revising the developed e-dictionary based on expert validation, the next crucial phase is its implementation in a small class setting. This stage is designed to observe how the e-dictionary performs in a real-world learning environment and to gather feedback from both the preschool students and their parents.

The implementation process begins with an orientation session for parents and children, introducing them to the e-dictionary's features, functions, and intended use. This step ensures that everyone involved understands how to navigate the app, access its content, and utilize its interactive elements. Parents play a crucial role in this stage as facilitators, guiding their children's interactions with the e-dictionary and providing support when needed. By involving parents, the implementation process also highlights the app's potential for fostering collaborative learning experiences at home.

During the implementation, preschool students use the e-dictionary in guided activities that align with their developmental level. For instance, children may explore vocabulary categories, listen to word pronunciations, and participate in interactive quizzes designed to reinforce their learning. Teachers or facilitators are present to observe the children's engagement, noting how easily they navigate the app, how effectively they respond to its features, and how well they retain the vocabulary introduced. Observations during this stage provide valuable insights into the app's usability and educational impact.

Feedback from parents is another critical component of the implementation phase. Parents provide unique perspectives on how the app aligns with their children's learning needs and preferences. Their observations about their children's engagement, enthusiasm, and progress offer practical insights that might not be immediately apparent to the developers. Additionally, parents may suggest improvements to the app's design or functionality based on their own user experience, contributing to its overall enhancement.

By the end of the implementation phase, the development team compiles all observations, feedback, and data collected during the small class trial. These findings are analyzed to determine the app's strengths, weaknesses, and areas for improvement. Based on this analysis, further refinements may be made to enhance the e-dictionary's effectiveness and usability.

Evaluation Phase

To determine the usefulness, effectiveness, and advantages of the e-dictionary for its users, the researcher employed a combination of questionnaires and field notes to gather comprehensive feedback from the parents of preschool students. This dual approach ensures a well-rounded understanding of how the e-dictionary performs in a real-world learning context, capturing both quantitative and qualitative insights. Parents serve as invaluable sources of information, as they closely observe their children's interactions with the e-dictionary and can provide detailed feedback on its impact on their learning process.

The questionnaire is designed to address key aspects of the e-dictionary, focusing on its content, usability, and overall design. Specific questions delve into the app's effectiveness in improving the children's language skills, such as vocabulary acquisition and pronunciation. Parents are asked to evaluate whether the app encourages active engagement and whether the tasks and activities, such as quizzes, are age-appropriate and enjoyable for their children. Additionally, the design of the e-dictionary is assessed, with questions about its visual appeal, ease of navigation, and interactivity. These elements are crucial in determining whether the app successfully meets the developmental and educational needs of preschool students.

The responses from the questionnaires are analyzed quantitatively using percentages to provide a clear and objective measure of the app's effectiveness. A benchmark of 80% approval is set as the threshold for determining whether the e-dictionary is suitable for its target audience. If at least 80% of the parents

rate the app as appropriate for their children, it is considered ready for broader use without further revision. This benchmark ensures a high standard of quality and user satisfaction, reflecting the app's success in meeting its intended objectives. However, if the analysis reveals that the app falls short of this threshold, the feedback collected through the questionnaires and field notes is used to identify specific areas for improvement.

FINDINGS AND DISCUSSION

The Result of Analysis Phase

The data obtained in this stage provide basic information in developing an E-Dictionary complete with the materials and all of the things about it. To know the need for the Preschool level forward the materials used in the learning process at E-Dictionary, the researcher distributed the questionnaire to the 40 parents who have children at the preschool level. The following paragraph will discuss the result of the questionnaire.

For the need for the media that is used in English vocabulary, 85% of parents claimed that using E-Dictionary is more interesting to make their children easy to understand the materials and also to attract them to study the materials. Concerning the type of media which help the children to understand easily, 90% of parents claimed that the materials and exercise will be easy to understand if the learning process uses interesting media and play a game related to the materials and the level of their children. Meanwhile, 10 % of parents stated that the materials and exercise will be easy to understand if the vocabulary learning process will be taught by the parents.

And the last aspect is about the type of exercise that gives to the students. From 40 parents to respondents, their responses vary. They all agree that the interesting media should give to the following criteria, are: (1) using a game as a media in their learning process, (2) using an interactive media, (3) colorful media appearance, and (4) varied delivery of materials.

Based on the result of the questionnaire to the students, it can be concluded that they need various media which can improve their English, the exactly in English vocabulary with interesting media such as E-Dictionary and Game to make their children motivated in learning English vocabulary.

The Result of Design Phase

According to the results of the need analysis, it needs a media that is more interesting and easier to apply in the learning process of Vocabulary for Preschool. The App is specially designed to assess and expand the preschool's understanding of the vocabulary.

There were some steps in developing the E-Dictionary. The first step of developing media was setting the content of the media based on the Preschool level. The next step was selecting and choosing the type of quizzes that suitable for the preschool's ability and make it clear from the command and question related to the topic. Then, the last step was made the E-Dictionary from the layout, type of game, and the rule of the game that look attractive and easy to understand because the user of the E-Dictionary is a very young learner that still interesting in a game, color, picture, audio, and others.

The Result of Development Phase

There were some steps in developing the E-Dictionary. The first step of developing media was setting the content of the media based on the Preschool level. The next step was selecting and choosing the type of quizzes that were suitable for the preschool's ability and making it clear from the command and question related to the topic. Then, the last step was making E-Dictionary from the layout, type of game, and the rule of the game that look attractive and easy to understand because the user of the E-Dictionary is a very young learner that still interested in the game, color, picture, audio, and others.

Having finishing developing the app, it is brought to the expert to have validation. There are two types of expert validation in terms of media expert and content experts. The result from the result of media according to design, type of exercise, language content, and organization. There are several aspects of the media that need more revision to be good quality media and can fulfill the student's needs and abilities. This aspect is the attractiveness of the E-Dictionary and the use of E-Dictionary. In term of content, there is one aspect of the media that need more revision to be good. This aspect is about the use of E-Dictionary based on grammar skills and the types of exercises.

Then, the are some revisions taken to make it better. The revision was made based on experts' judgements. In addition, there are some revisions related to the layout unclear such as the color of the background which sometimes makes the text unclear to read. Third, the revision of the picture and the vocabulary should take in a column to make it tidier. And the last about the instruction which is

considered less clear for the student, it causes the object to be at the Preschool's level, so we need clear instructions for that media.

The Result of Implementation Phase

The revised drafts of the media were tried out by the Preschool to get feedback from the Parents according to their children's mind side. They tried to apply that E-Dictionary and they have to answer the quizzes with their parents' help.

After the score was converted to achievement level, the materials were categorized on very good criteria. And based on parents' comments, there is some point concerning the E-Dictionary. First, the students said that there is any activity that can be used to increase their motivation in English. Second, the layouts that support a material evaluation in the media are colorful and clear. And the students also said that the vocabulary of the game quiz is familiar to them, so they could do the Game Quiz easily.

The Result of Evaluation Phase

In conclusion, based on the try-out result, there was no revision again for the media. But to make it better, it still needed a little revision from students' suggestions and comments.

After having completed procedures in materials and exercise development, the final product E-Dictionary "Animal Vocabulary" is ready. The product includes Material about animal vocabulary, animal sounds, and quizzes. And all of these parts, are compiled in an Android-based application.

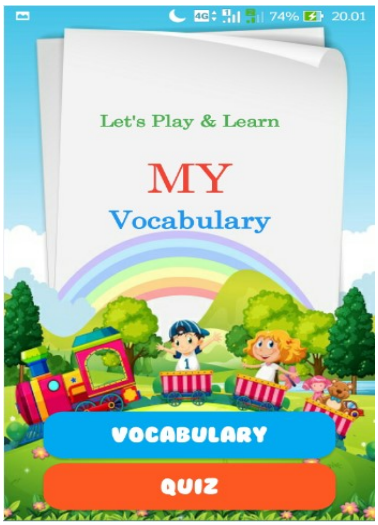

Figure 1. The main page of E-dictionary

Besides, the layout and the type were made attractive and interesting, the contents of the media can support the student's ability and stimulate it to improve the student's vocabulary, and the materials and exercises provided in that App can increase the student's motivation for their English vocabulary.

Discussion

This article details the step-by-step development of the e-dictionary, from initial planning and content design to app implementation and testing. It highlights the potential of MIT App Inventor as an accessible tool for creating impactful educational applications.

By combining the simplicity and accessibility of MIT App Inventor with a deep understanding of developmental psychology and language learning principles, this project aims to create an educational resource that is not only effective but also enjoyable for young learners. It is suitable for the children as in the digital Age nowadays since the platform's allows children learn and engage digitally by integrated learning, which is based on games, into learning curriculum for language instruction (Akour et al., 2020; Chambers & Sandford, 2018; Onishchuk et al., 2020). Through features like interactive visuals, sound effects, and customizable quizzes, the e-dictionary can serve as a bridge between the traditional and digital realms of education, making the learning experience both familiar and forward-looking.

The advantages of integrating an e-dictionary into preschool education are manifold. First, it aligns with the cognitive preferences of young learners, who thrive on visual and auditory stimuli. Incorporating colorful images, sound effects, and simple animations can significantly boost their retention and recall of new words. Second, the interactive nature of the app encourages active participation, which is critical for sustaining attention and fostering deeper learning. Third, the customizable features of MIT App Inventor allow the e-dictionary to be tailored to diverse linguistic and cultural contexts, making it a versatile resource for early education worldwide.

However, the development process is not without its challenges. Designing an app for preschoolers requires careful consideration of their limited reading and motor skills, short attention spans, and need for intuitive navigation. The interface must be simple yet engaging, with clear instructions and user-friendly controls. Moreover, content selection plays a pivotal role, as it must align with the linguistic milestones typical of preschool-age children. Words and concepts should be chosen to reflect their immediate environment and

experiences, promoting relevance and contextual understanding. Furthermore, the study underscores the importance of incorporating feedback from educators, parents, and the children themselves to ensure the app's usability and effectiveness.

As digital tools continue to reshape the educational landscape, projects like this highlight the importance of leveraging technology not just for its novelty but for its capacity to meet real educational needs. Innovative initiatives such as the e-dictionary pave the way for a more inclusive, interactive, and effective learning environment for the youngest members of our society. They underscore the need for continued investment in research and development at the intersection of technology and education, ensuring that tools like these remain adaptive to the evolving needs of learners. In doing so, they lay a foundation for future generations to thrive in a world where digital literacy and early learning go hand in hand.

CONCLUSION

The "My Vocabulary" App that was developed by *Kodular (MIT App Invertor*) that were given to the student to get positive comments from the preschool level and their parents. Because this media was developed based on parents' need to motivate their children in English vocabulary.

To make an interactive media based on MIT App Invertor to make "My Vocabulary" as interactive media some steps should be done for it, starting from need analysis, developing material, expert validation, revision, try out, and final product. This app has been successful to attract children's attention and improving their vocabulary mastery. And the result of that is so satisfying. Almost all of them got a good score and all of them feel comfortable and motivated by the presence of the media.

In conclusion, the creation of an e-dictionary for preschool students using MIT App Inventor represents a significant stride toward integrating technology into early childhood education. As technology continues to permeate every aspect of life, its application in education has proven to be transformative, particularly for young learners who are growing up in an increasingly digital world. The use of an e-dictionary specifically designed for preschoolers not only modernizes traditional learning methods but also aligns with their developmental needs by incorporating interactive, multimedia-rich content.

Such tools go beyond mere vocabulary acquisition; they foster engagement, curiosity, and a love for learning during a crucial developmental stage.

REFERENCES

Akour, M., Alsghaier, H., & Aldiabat, S. (2020). Game-based learning approach to improve self-learning motivated students. *International Journal of Technology Enhanced Learning*, 12(2), 146–160. https://doi.org/10.1504/ijtel.2020.106283

Alharbi, M. A. (2016). Using different types of dictionaries for improving EFL reading comprehension and vocabulary learning. *The JALT CALL Journal*, *12*(2), 124–149. https://doi.org/10.29140/jaltcall.v12n2.j204

Amirian, S. M. R., & Heshmatifar, Z. (2013). The impact of using digital dictionary on vocabulary learning and retention of Iranian EFL learners. *Int. J. Res. Studies in Educ. Tech*, *2*, 35–44. https://doi.org/10.5861/ijrset.2013.384

Chambers, F., & Sandford, R. (2018). Learning to be human in a digital world: a model of values fluency education for physical education. *Sport, Education and Society*. https://doi.org/10.1080/13573322.2018.1515071

Cowan, K., & Flewitt, R. (2021). Moving from paper-based to digital documentation in Early Childhood Education: democratic potentials and challenges. *International Journal of Early Years Education*, 1–19. https://doi.org/10.1080/09669760.2021.2013171

Dashtestani, R. (2013). EFL teachers' and students' perspectives on the use of digital dictionaries for learning English. *CALLEJ*, *14*(2), 51–65. https://callej.org/index.php/journal/article/view/210

Gleason, B., & Von Gillern, S. (2018). Digital citizenship with social media: Participatory practices of teaching and learning in secondary education. *Journal of Educational Technology & Society*, 21(1), 200–212. http://www.jstor.org/stable/26273880

Isikoglu Erdogan, N., Johnson, J. E., Dong, P. I., & Qiu, Z. (2019). Do parents prefer digital play? Examination of parental preferences and beliefs in four nations. *Early Childhood Education Journal*, 47(2), 131–142. https://psycnet.apa.org/doi/10.1007/s10643-018-0901-2

Johnson-Barlow, E.M.; Lehnen, C. (2021). A scoping review of the application of systematic instructional design and instructional design models by academic librarians. *J. Acad. Librariansh*, *47*, 102382. https://doi.org/10.25417/uic.18322169.v1

Lawrence, S. M. (2018). Preschool children and iPads: Observations of social interactions during digital play. *Early Education and Development*, 29(2), 207–228. https://psycnet.apa.org/doi/10.1080/10409289.2017.1379303

Lindberg, R. S. N., Laine, T. H., & Haaranen, L. (2019). Gamifying programming education in K-12: A review of programming curricula in seven countries and programming games. *British Journal of Educational Technology*, 50(4), 1979–1995. https://doi.org/10.1111/bjet.12685

Li, X., & Chu, S. K. W. (2021). Exploring the effects of gamification pedagogy on children's reading: A mixed-method study on academic performance, reading-related mentality and behaviors, and sustainability. *British Journal of Educational Technology*, 52(1), 160–178. https://doi.org/10.1111/bjet.13057

Magnusson, L. O. (2021). Digital technology and the subjects of literacy and mathematics in the preschool atelier. *Contemporary Issues in Early Childhood*, 24(3). https://doi.org/10.1177/1463949120983485

Onishchuk, I., Ikonnikova, M., Antonenko, T., Kharchenko, I., Shestakova, S., Kuzmenko, N., & Maksymchuk, B. (2020). Characteristics of foreign language education in foreign countries and ways of applying foreign experience in pedagogical universities of Ukraine. *Revista Romaneasca Pentru Educatie Multidimensionala*, 12(3), 44–65. https://doi.org/10.18662/rrem/12.3/308

Ratminingsih, N. M., Agustini, K., Budasi, I. G., Adnyani, L.P.S., & Ana, I.K.T.A. (2022). Digital Versus Printed Multilingual Dictionary: Developing Young Learners' English Literacy. *Theory and Practice in Language Studies*, Vol. 12, No. 12, pp. 2508-2518. DOI: https://doi.org/10.17507/tpls.1212.05

Rezaei, M., & Davoudi, M. (2016). The Influence of Electronic Dictionaries on Vocabulary Knowledge Extension. *Journal of Education and Learning*, *5*(3), 139–148. https://doi.org/10.5539/jel.v5n3p139.

Rulyansah, A., Hidayat, M.T., Rihlah, J., Shari, D., & Mariati, P. (2023). Digital Play for Enhancing Language Learning in Early Grades. *Pegem Journal of Education and Instruction*, Vol. 13, No. 2, 182-190. DOI: 10.47750/pegegog.13.02.22 https://files.eric.ed.gov/fulltext/EJ1386834.pdf

Schall-Leckrone, L. (2018). Coursework to classroom: Learning to scaffold instruction for bilingual learners. *Teacher Education Quarterly*, 45(1), 31–56.

Spatioti, A. G., Kazanidis, I., & Pange, J. (2022). A comparative study of the ADDIE instructional design model in distance education. *Information*, *13*(9), 402. https://doi.org/10.3390/info13090402

Trinh, T. L. A., Tran, T. K. N., Vo, T. B. N., & Huynh, T. T. S. (2021). The difference effects of paper dictionaries vs. online dictionaries. *AsiaCALL Online Journal*, *12*(3), 28–38. Retrieved September 12, 2021, from https://asiacall.info/acoj

Trust, T., & Pektas, E. (2018). Using the ADDIE model and universal design for learning principles to develop an open online course for teacher professional development. *J. Digit. Learn. Teach. Educ.*, *34*, 219–233. https://doi.org/10.1080/21532974.2018.1494521