Digital Teaching Materials Development Containing Environmental Education Using Task Based Language Learning (TBLL)

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Abstract—The Covid-19 pandemic results in unavoidable changes in all aspects of life, including education. This pandemic has led to the opportunity to enter digital learning. This study aims to develop digital learning materials based on Task-Based Language Teaching (TBLT) which contains environmental education for senior high school students. This Research & Development (R&D) was based on Plomp's development model. Digital learning materials were developed using the i-Spring application and integrated with the LMS Edmodo. The instruments used were questionnaires, observation sheets, and tests. The results of the study showed that digital learning materials were valid, practical, and effective for use in language learning. Besides, the developed model was validated with a self-validation value of 93.12% and an expert validation value of 93.18%. The developed model was tested for its practicality with a teacher practicality value of 93.54% and student validity of 80.62% with the category of very practical. The learning activity score reached 93.33% with the category of very active learning. Based on statistical data analysis, the developed digital learning materials were effective in improving learning outcomes.

Index Terms—Digital Teaching Materials, TBLL, environmental education, language learning

I. INTRODUCTION

Online learning is in line with the new era of Industry 4.0 (Van & Thi, 2021). Online learning is believed to be interactive and creates an environment in which students are actively engaged with the material and learn through practical activities and refer to their previous knowledge when receiving new knowledge (Priyadarshani & Jesuiya, 2021). Online learning becomes highly relevant in recent decades and the use of online learning has increased during the COVID-19 pandemic. This pandemic also leads to the use of online learning worldwide for life (Kanthimathi & Raja, 2021). Besides, it changes the concept that "online classes are optional" to "online classes are required" (Priyadarshani & Jesuiya, 2021).

Online learning is a teaching and learning system that utilizes electronic media, especially the use of the internet to access material; interact with the materials, teachers, and other students; and obtain assistance in the learning process to acquire knowledge, create meaning, and progress through experiential learning (Van & Thi, 2021). In this case, the interaction can be carried out through teaching materials. The importance of digital learning materials is an undeniable fact. Studies reveal that the technology and materials used by teachers in the learning process in class make learning more enjoyable (Şimşek & Yazıcı, 2021). To improve academic achievement as the main objective of teaching activities, it is highly recommended to use interesting teaching materials. A meta-analysis study on the use of materials in education shows that computer presentations, physical materials, concept maps, comic strips, and mixed materials have a positive effect on academic achievement (Ilhan et al., 2021).

Teaching materials are tools and resources offered by teachers to students to develop their knowledge, skills, attitudes, and values (Akkaya & Al Kapıdere, 2021). They can be simple materials such as models and photographs, as well as electronic devices such as computers, audio recorders, and cameras (Akkaya & Al Kapıdere, 2021). Digital learning material can increase students' curiosity, creativity, interest, and motivation (Gül & Costu, 2021). Thus, the curriculum, classroom environment, and learning materials must be designed to meet the needs of students (Renzulli & Reis, 2014). Learning materials have to pose challenges for students even after they have left the classroom (VanTassel-Baska, 2011). Therefore, materials do not only play a role in creating knowledge in learning activities but also act as a cue to act (Carvalho & Yeoman, 2021).

As education systems are replacing conventional educational approaches, it is important to prepare the materials according to the digital era to support learning. Teachers who have 21st-century competencies have to design educational materials suitable for the subject (Ilhan et al., 2021). Some of the criteria of learning materials are attracting students' attention, and appealing to different sense organs, according to the program and students' cognitive levels. In selecting the materials, learning outcomes, characteristics of students and teachers, and the learning environment must be considered (Akkaya & Al Kapıdere, 2021). Besides, students are also concerned with the ease of access to digital materials, and whether the learning information provided is necessary, correct, and useful (Tsai et al., 2021).

Learning materials improve the quality of education and provide students with a rich learning environment. One of the most emphasized skills in curriculum changes in recent years is the preparation and use of materials. To create an effective, efficient, and active classroom environment, concrete teaching materials supported by new and different methods and techniques are needed for more meaningful learning (Akkaya & Al Kapıdere, 2021). Online learning should be considered as a method for transferring knowledge and developing students' professional competence without losing the advantages of face-to-face interaction (Frolova et al., 2021).

Concerning the application of technology, González-Lloret and Ortega (2014) suggest that TBLT can potentially benefit from using ICT resources due to its positive motivational impact on students that can encourage language learning (Rodríguez-peñarroja, 2022). Researchers have tried to incorporate the TBLT approach into online classes (Arslanyilmaz & Pedersen, 2010). In online learning, TBLT is much more challenging than face-to-face learning as it attracts and retains students' attention and promotes community building (Baralt & Morcillo Gómez, 2017; Perveen, 2021). Besides, TBLT can be implemented into more flexible media, not limited to face-to-face learning (Hiromori, 2021), for example, digital learning materials.

Over the last 40 years, TBLT has attracted many language teachers around the world. Some categorize TBLT as an approach, but others consider it as a method of the 'branch of Communicative Language Teaching' (Kararuddin, 2022). TBLT focuses on using authentic language and asking students to perform meaningful tasks using the target language (Ayar, 2021). With the increase in the emphasis on communicative competence and task-based language teaching, language teachers start to provide more open-ended language assignments as pedagogical activities and assessments (Chen, 2018). With the increase in the emphasis on communicative competence and task-based language teaching, language teachers start to provide more open-ended language assignments as pedagogical activities and assessments (Purpura, 2019; Vercellotti & Mccormick, 2021). Task engagement has also been considered as the quality of effort and the number of student interactions (Egbert et al., 2021).

TBLT is beneficial as it is more student-centered (Chen, 2018), It allows for more meaningful communication and often offers extra practical linguistic skill development (East, 2019). In TBLT, tasks tend to be familiar to students so they are more likely to engage in learning. Besides, tasks support language acquisition through the required language interaction (Lume & Hisbullah, 2022). This method is beneficial for language learners as it not only helps create a real purpose of use but also provides a natural context for the learner to learn the language (Kamalian et al., 2017; Kanoksilpatham & Saranakkharin, 2019). TBLT helps students learn through activities that prioritize doing tasks using various activities to help students understand and read text clearly (Styati & Khasanah, 2021). Moreover, it is believed that when students learn a language by completing tasks, they are motivated. This method consists of specific constituents such as objectives, procedures, and specific results, and supports content-oriented and meaningful activities rather than linguistic forms (Ifeduba et al., 2022).

TBLT aims to provide opportunities for learners to master the language both spoken and written through learning activities designed to engage learners in the natural, practical, and functional use of language for meaningful purposes (Murat & Hismanoglu, 2015). Through the use of technology for supporting learning, TBLT requires students to engage in more activities in various pedagogical procedures to their skills to solve their linguistic problems in communication (Mufliharsi et al., 2022). In TBLT, students concern with communicating meaning through interaction with tasks (Cutrone & Beh, 2018). When using language for legitimate purposes, students have to think about the form of language as a whole, not just one particular form (Sholeh et al., 2021).

In TBLT, students have to assume greater responsibility than just waiting for bribed information (Nunan, 2004). Students are expected to participate actively in learning activities including completing tasks (Sholeh et al., 2021). The communicative task that encourages learners' actual use of language can be considered part of TBLT including tasks that potentially enable students to utilize what they previously learned in situations they may encounter outside the environment (Kanoksilpatham & Saranakkharin, 2019). In addition, TBLT features emphasize meaningful learning, involvement in the process of using language in the real world, and involvement in cognitive processes (Ellis, 2009).

TBLT provides learners with a natural source of meaningful material, ideal situations for communicative activities, and supportive feedback for more opportunities for language practice (Sun, 2022).

The development of studies on TBLT in varied settings, methods, and theories opens the way for understanding tasks and learning (Murat & Hismanoglu, 2015). Classifying tasks according to different perspectives offers teachers a variety of teaching methods to suit the interests of the learners in order to promote effective teaching and learning (Ardika et al., 2022). In terms of methodology, TBLT has its own learning framework, syllabus design principles, and material development procedures (Willis, 2016). However, they can be modified and innovated according to the needs and situations of students. Therefore, this study aims to develop TBLT-based digital learning materials. For getting interesting and useful materials in addition to knowledge and language skills, digital learning materials also contain environmental education.

Recent technological development has increased opportunities to intervene in nature which has become a significant pressure on the environment (Demirkaya, 2020). The natural environment in which all living things live has existed for many years without any problems in living things' interaction. However, population growth, industrialization, over-consumption, unplanned urbanization, damage to the natural environment, and depletion of natural resources have caused many environmental problems (Hamalosmanoğlu et al., 2020). In return, the earth gives back what we have done through various environmental phenomena which may end our length of stay on this planet if it gets worse (Marpa, 2020). Educating students who are more sensitive to the environment and understanding the importance of preserving nature for future generations through environmental education is expected to address environmental issues (Calis & Yildirim, 2020).

Understanding the environmental education practice and policy both in the formal and informal areas of the educational process allows us to rethink our actions (Pinto & Totti, 2020). Environmental education is a tool for addressing global environmental pressures caused by local or global events (Chen et al., 2018). Globalization causes existing environmental problems to get worse and affects the local, regional, and global environment (Hollstein & Smith, 2020).

Environmental education is a continuous learning process that allows humans to recognize concepts related to their environment, enabling them to develop a positive attitude toward the environment and a high level of sensitivity and awareness of environmental issues (Topal et al., 2020). Environmental education aims to face rapidly changing environmental issues (Arioder et al., 2020; Chen et al., 2020). Besides, it provides individuals with environmental attitudes, environmentally-friendly behavior, and skills needed to protect and improve the environment and gain environmental awareness (Yeşilyurt et al., 2020).

One of the reasons for the inclusion of Environmental Education in the curriculum is due to the manifestation of a real socio-environmental crisis, in addition to the actions of the environmental movement and the initiatives themselves, individuals from some schools, because the teaching of Environmental Education, in a certain way, saves a new dimension for inclusion in educational process, bringing reflection on the consequences of environmental change (Marques & Xavier, 2020). Environmental education is one of the main tasks of the school because the process of formal education is more important and valuable for children to gain environmental awareness compared to non-formal education (Ablak & Yeşiltaş, 2020). This activity can effectively improve student learning outcomes on environmental awareness and sensitivity, knowledge of environmental concepts, environmental values and attitudes, environmental action skills, and environmental action experience (Yeşilyurt et al., 2020).

Information technology offers wide opportunities, including in education such as online education, access to educational e-resources, modern scientific publications, lectures by well-known scientists, etc. In this case, digital technologies play an important role in environmental education to shape students' environmental culture (Zakharova et al., 2020). The high school curriculum in Indonesia considers environmental education as a non-specific subject. Therefore, environmental education can be integrated into learning. This study aims to develop a digital learning material model based on TBLT containing environmental education in language learning for senior high schools.

II. METHOD

This Research & Development (R&D) aims to develop a digital learning material based on Task-Based Language Teaching (TBLT) containing environmental education. The development model was based on Plomp's model (Plomp & Nienke, 2013). This model consisted of three stages, namely, Preliminary Research (needs analysis, student analysis, curriculum analysis, concept analysis, analysis of learning objectives formulation), prototyping stage (product design and validation), and assessment stage (product testing to determine practicality and effectiveness values). This study produced digital learning materials based on model syntax which is innovated first according to the needs of the students and the learning situation. The material was based on the text-based 2013 curriculum. The research was conducted in an online learning setting due to the Covid-19 pandemic. Learning was done synchronously and asynchronously. Synchronous learning was carried out using the Zoom Meeting application and asynchronous learning used the digital teaching materials developed with the Ispring application (Ramadhan et al., 2022).

Product trials were carried out at State Senior High School 2 Padang. This school was selected using a purposive sampling technique with the criteria of students registered at state senior high schools in Padang City; open to accept innovation; can establish good cooperation; and have adequate facilities and infrastructure for conducting the study

(Ramadhan et al., 2022). The trial schedule was adjusted to the school curriculum so that the product developed is suitable for use at that time, namely for odd semesters. The research instruments were questionnaires, observation sheets, and tests. Data were analyzed descriptively and completed with the analysis of the validity, practicality, and effectiveness of the learning model. The selected students as limited trial subjects and wide-scale trial subjects based on the predetermined criteria are presented in Table 1.

TABLE 1
TEST SUBJECT

Free trial class	Total students
Experoment class	30 students
Control Class	30 students

Data were analyzed descriptively for describing the validity and practicality of the developed materials. The effectiveness data in the form of student learning outcomes were analyzed using SPSS 26. The instruments used in data collection can be seen in Table 2.

TABLE 2
RESEARCH INSTRUMENT

Type of data	Data source	Data collection tools
Preliminary research	Teacher & students	Interview guide sheet, questionnnaire
Prototyping phase	Validator	Questionnnaire
Assessment phase	Teacher & students	Observation sheet, questionnaire, test

III. RESULT

A. Preliminary Research

Preliminary research was to determine the needs of students and learning situations. In this stage, data were collected by distributing questionnaires to teachers and students. Based on the results of the study, learning was carried out online by utilizing technological devices and applications that support the learning process. Based on the questionnaire filled out by the teacher, it can be concluded that. (1) The learning materials used are dominated by printed materials published by the Ministry of Education and Culture and supported by material found online; (2) The learning model is dominated by tasks; (3) Learning is done individually or independently; and (4) The media used are dominated by WhatsApp, YouTube, Google Classroom, and Zoom meeting applications. The learning is done online by utilizing various applications but learning materials are recommended so that students can use them anytime and anywhere.

Based on the results of a questionnaire filled out by the students, students' ability to use technological devices is above average. The majority of students agree that environmental education needs to be integrated into learning. Most students have their own mobile devices, so it is not difficult to use digital learning materials. The digital learning materials were developed using the TBLT model. This model needs to be innovated and tasks are adjusted to the steps of the learning model. Giving tasks without a goal causes learning outcomes less optimal. The results of this stage can be read in the related article (Ramadhan et al., 2021).

B. Prototyping Phase

This stage was to design products in the form of digital learning materials. The learning process using this product was supported by learning media such as Networking Sites (SNS) and Social Networking Learning (SNL). Some SNS and SNL are connected to digital teaching materials and some are not. The learning also used the Zoom meeting application to meet face to face between teacher-students and students. In this study, TBLT-based digital teaching materials were developed using the i-Spring application. This application can help students independently study and can connect various links so that they are connected to class SNL accounts. Besides, the researcher also used the Edmodo application.

Digital learning materials are developed in accordance with the developed syntax as presented in Figure 1 below. The explanation of this model can be seen in the previous studies (Ramadhan et al., 2021). The digital learning materials contain environmental education so the text is related to environmental knowledge in order to raise students' environmental awareness. Figure 2 presents some parts of the learning materials and Figure 3 shows the online learning process.
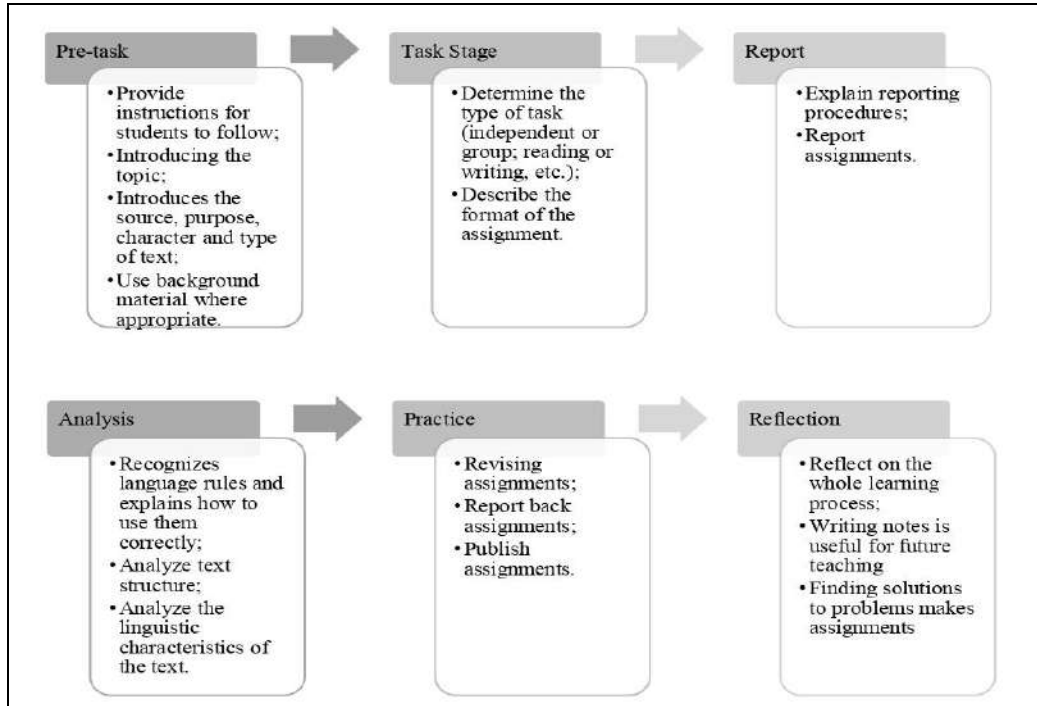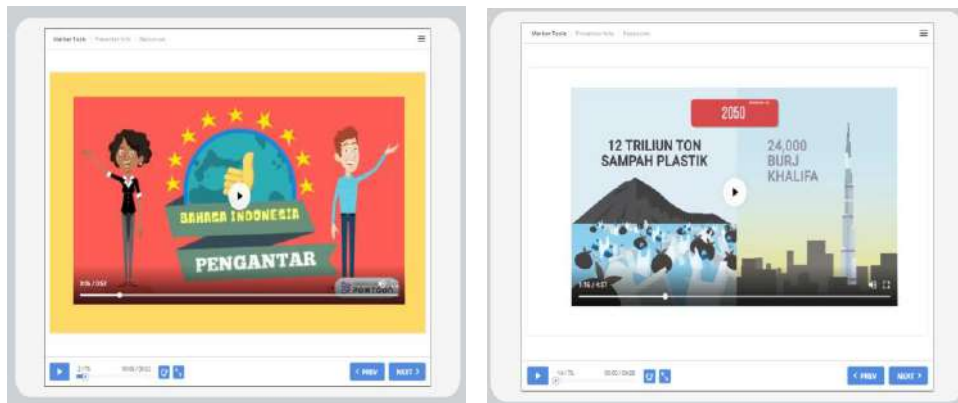
Figure 1. Task-Based Digital Teaching Materials Design

Figure 2. Digital Teaching Materials (Source: https://www.youtube.com/watch?v=pnuiEGuThsI&t=11s)
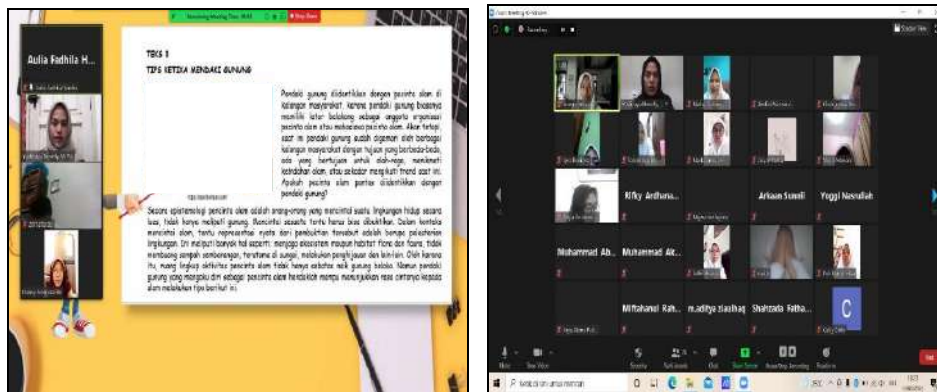

Figure 3. Learning Using Zoom Meeting

After designing the digital learning materials, the developed materials were validated through self-validation and expert validation. Self-validation was carried out by self-assessment using a validation sheet before the product is assessed by the expert. The validation covered the feasibility of the content, language, and presentation. The validity obtained a value of 93.12% with a very valid category. Besides, the product was validated by the expert using a validation sheet. The selected experts to validate the materials were lecturers or teachers. The aspects of validation by the expert covered content, language, presentation, and graphics. The validation sheet was filled out by each expert

according to their expertise. The validation by the expert obtained a value of 93.18% with the very valid category. Thus, the developed digital learning materials can be tested in the field (schools) for use by students to determine the practicality and effectiveness of the developed materials.

C. Assessment Phase

The developed materials that have been declared valid were then tested in the field. The trial was conducted at State Senior High School 2 Padang involving 2 classes, namely the control class and the experimental class. In the control class, the learning process was carried out as usual, while the experimental class used the developed digital learning materials. The learning process was carried out in four meetings and one meeting for testing the effectiveness of the product. The trial was carried out in online learning during the Covid-19 pandemic.

The trial involved Bahasa Indonesia, teachers. The practicality of digital learning materials was assessed by distributing questionnaires after completing the learning process. It is important to know whether the materials are practical teaching materials for use in learning Bahasa Indonesia. The questionnaire contains statement items based on practicality indicators, namely ease of use, and can be studied within the allotted time. Besides, practicality is also seen based on the learning process activities carried out. The results of the practicality of the developed materials are presented in Table 3 below.

TABLE 3
PRACTICALITY OF DIGITAL TEACHING MATERIALS

Type of data	Practicality	Category
Practicality by teachers	93.54%	Very practice
Practicality by students	80.62%	Very practice
Students learning activity	93.33%	Very Active

The final stage was to assess the effectiveness of the developed product. It can be seen from the assessment of students' knowledge through cognitive tests, students' attitudes, and students' writing skills. Cognitive tests were carried out by assessing students' knowledge of the developed material, namely procedure texts. This test focused on the ability to understand reading. Students' attitude was assessed by observing students' attitudes during learning. Observations are made by the teacher because it is more objective. The students' writing skills were measured by assessing students' skills in writing procedure texts. The test was carried out after completing the learning process using the developed materials. Through this test, student competence was tested to see the effectiveness of the developed materials. The results of the writing performance were based on predetermined indicators in which each aspect of writing was scored and the total score was counted using a formula. The effectiveness of the product was measured by comparing the control class and the experimental class. The control learned according to the lesson plan, while the experimental class learned by using designed digital learning materials. The effectiveness value can be seen below.

First, the cognitive test to test students' knowledge of the developed materials, namely procedure texts was in the form of multiple choice and essays. The test covered the nature of the text, the purpose of the text, the structure of the text, the linguistic features of the text, and the content of the text. The score was described in descriptive data. The test involved 30 students. In the experimental class, the average score reached 85.55 with the predicate "A". Meanwhile, the average score in the control class was 78.08 with the predicate "B". The experimental class has a higher score than the control class. It can be said that the TBLT-based digital learning materials containing environmental education are effective in increasing student scores.

Second, the attitude assessment was carried out in the experimental class during learning using the developed learning teaching materials. This assessment aims to measure and determine aspects of attitude competency integrated into learning, namely honesty, discipline, responsible, and activeness. Based on the results of the analysis, it can be concluded that the average score of student attitudes in learning using the developed materials was 93.3% with the predicate "A".

The analysis was continued by assessing students' ability to write procedure texts. The test used a performance test sheet consisting of context, instructions, and an assessment rubric. The final test was to determine the effectiveness of the developed materials by looking at differences in learning between the control and experimental classes. The results of the analysis of learning outcomes in the experimental and controls are presented in Table 4 below.

TABLE 4
STUDENTS LEARNING OUTCOMES

Group	Mean	N	Std. Deviation
Control	66.8653	30	18.67896
Experiment	90.5100	30	7.81843
Total	78.6877	60	18.53854

The experimental class that used the TBLT-based digital learning materials containing environmental education has a higher learning outcome score than the control class. Before testing the hypothesis, a requirements analysis test, namely normality and homogeneity tests should be carried out. The normality test was carried out using SPSS 17. The results of the normality test are presented in Table 5 below.

TABLE 5
TEST OF NORMALITY

	group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Learning outcomes	Control	.191	30	.007	.941	30	.096
	Experiment	.221	30	.001	.862	30	.001

a. Lilliefors Significance Correction

Based on the table above, the df values for the experimental and the control classes are 30 students each. This means that the data samples for each group are less than 50. Thus, this study used the Shaporo-Wilk technique to determine the normality of the data with the Sig. value of 0.001 for the experimental class and 0.096 for the control class. As the Sig. value for one group is <0.05, then as a basis for decision-making in the normality test, it can be concluded that the data on learning outcomes for one of the groups are not normally distributed. Therefore, testing was continued by using a non-parametric test with the Mann-Whitney test and the results are presented in Table 6 below.

TABLE 6
MANN-WHITNEY U TEST

	Learning outcomes
Mann-Whitney U	101.500
Wilcoxon W	566.500
Z	-5.212
Asymp. Sig. (2-tailed)	.000

The basis for making decisions on the Mann-Whitney Test is as follows. (1) If Sig. (2-tailed) > 0.05, then H0 is accepted or Ha is rejected. This means that there is no difference in the average learning outcomes between the experimental class and the control class. (2) If Sig. (2-tailed) < 0.05, then H0 is rejected or Ha is accepted. This means that there is a difference in the average learning outcomes between the experimental class and the control class (Scristia et al., 2020).

Based on the results of the "Mann Whitney Test" the Sig. value (2-tailed) obtained 0.000 <0.05 so that H0 is rejected or Ha is accepted. This means that there is a difference in the average learning outcomes between the experimental class and the control class.

IV. DISCUSSION

Based on the results of the study, the use of TBLT-based digital learning materials is valid, practical, and effective for online learning of Bahasa Indonesia subjects. Many studies consider the advantages of large-scale digitalization which correlates with improving the quality of education (Gafurov et al., 2020; Malikov et al., 2020; Strokov, 2020; Tavstukha et al., 2021). Digitalization affects all areas of life including education, as one of the most dynamic environments (Andriushchenko, 2018; Tsarapkina, 2021).

Preville (2018) recommends that teachers have to utilize and take advantage of technological development such as digital learning media to engage their students in language learning (in Demir & Sönmez, 2021). Digital learning materials can respond to developmental needs by considering individual student differences and make teaching more fun and effective (Şimşek & Yazıcı, 2021). Yazdi (2012, p. 143) revealed that in the application of digital-based learning, students are required to play an active (initiative) and exploratory role in finding and understanding their learning material. To make learning more meaningful, the developed materials can contain learning models or methods (Atmazaki & Indriyani, 2019; Indriyani & Ramadhan, 2017). In this study, digital learning materials were developed by integrating the TBLT model.

Keyvanfar and Modarresi (2009) explain that task-based activities as an effective, practical, and innovative teaching method. They can increase students' involvement in class activities and improve students' communicative skills (p. 81). It is in line with Dailey (2009) that TBLT is an interesting and interactive method for increasing students' communicative competence. Ellis and Shintani (2014) explain that the TBLT can improve students' language skills due to its ability to promote natural learning in the classroom environment. Other studies also found that task-based activities can increase students' understanding of learning material (Irfan, 2017; Mao, 2012).

Jeon and Hahn (2006) found that TBLT has a significant positive impact on students' English development as it provides learners with a natural source of meaningful material, ideal situations for communicative activities, and supportive feedback enabling greater opportunities to use the language (p. 123). Another study, Liu et al. (2021) found that EFL teachers seem to have a positive view sof TBLT and perceive that TBLT provides a variety of advantages to create a more communicative speaking environment in contexts (p. 131). Skehan (1996) claims that when expressing meaning under time pressure to complete a task can help students improve their language fluency. It is also believed to be able to increase students' intrinsic motivation than extrinsic motivation as it is student-centered (in Ho & Huyen, 2020).

During the Covid-19 pandemic, task-based learning has been implemented by some experts. The results showed the use of ask-based activities can provide better learning outcomes than the conventional method. This is in line with

Tartavulea et al. (2022) that the task-based teaching method provides a positive impact on the teaching and learning process despite the spread of COVID-19. Teachers can still do an excellent job of teaching if they use appropriate activities (p. 920). Flores (2020) stated that during the COVID-19 pandemic, the online task-based teaching and learning process could effectively help students read details, scan details, and discuss with friends in sync (p. 343). Besides, Ferrucci and Rullani (2020) stated that the use of the task basks approach during the COVID-19 pandemic could teach the academic community how to redesign the knowledge production process to share knowledge (p. 2).

V. CONCLUSSION

Based on the results of the discussion, it is important to innovate learning materials according to the needs of students and the current situation. The development of the digital era and the COVID-19 pandemic have changed the educational system which requires adapting to the needs of students and the situation. One alternative that can be used is developing TBLT-based digital learning materials containing environmental education as an alternative to learning. Digital learning materials were developed using the i-Spring application and linked to the Edmodo application so that learning can be done online. The developed product was validated and tested in class. The results showed that the products developed are valid, practical, and effective for use in language learning.

This digital learning material is expected to be an alternative for teachers in language learning. Even though this digital learning material and the TBLT model were developed and tested during the COVID-19 pandemic, the teaching material model can be used in face-to-face learning, blended learning, and online learning. Future studies can develop learning materials by integrating other models in accordance with the needs of teachers and students. Besides, integrating environmental education in language learning can be traced again in other articles.

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REFERENCES

[1] Ablak, S., & Yeşiltaş, E. (2020). Secondary school students' awareness of environmental education concepts. *Review of International Geographical Education*, *10*(3), 445–466.
[2] Akkaya, S., & Al Kapıdere, M. (2021). How do digital games utilization levels predict a teacher's digital material development self-efficacy? *World Journal on Educational Technology: Current Issues*, *13*(2), 322–335.
[3] Andriushchenko, T. K. (2018). Personal aspects of pedagogue's innovative culture. *Scientific Vector of the Balkans*, *1*, 13–16.
[4] Ardika, I., Sumartana, I., Hudiananingsih, P. D., Dewi, C., Widanta, R., & Santanu, G. (2022). Implementation of task-based language teaching on reading comprehension by the polytechnic students. In *Advances in Social Science, Education and Humanities Research* (Vol. 647, pp. 245–250).
[5] Arioder, L. J. Q., Arioder, V. Q., Quintana, V. V., & Dagamac, N. H. (2020). Application of constructivist teaching approach in introducing new environmental concepts to young elementary students in the Philippines: A small class sized experience from slime moulds modeling. *Interdisciplinary Journal of Environmental and Science Education*, *16*(2), 1-10.
[6] Arslanyilmaz, A., & Pedersen, S. (2010). Enhancing negotiation of meaning through task familiarity using subtitled video in an online TBLL environment. *Tojet*, *9*(2), 64–77.
[7] Atmazaki, & Indriyani, V. (2019). Design of reading materials based on contextual teaching and learning (CTL). In *Advances in Social Science, Education and Humanities Research*, (Vol. 301, pp. 235–241). Atlantis Press.
[8] Ayar, Z. (2021). Written discourse completion tasks in the foreign language examination (YDS). *Novitas-ROYAL (Research on Youth and Language)*, *15*(1), 38–56.
[9] Baralt, M., & Morcillo Gómez, J. (2017). Task-based language teaching online: A guide for teachers. *Language Learning & Technology*, *21*(3), 28–43.
[10] Calis, D., & Yildirim, H. I. (2020). The effect of prediction, observation, explanation supported project-based environmental education on the levels of attitude and behavior toward the environment. *Educational Policy Analysis and Strategic Research*, *15*(1), 22–43.
[11] Carvalho, L., & Yeoman, P. (2021). Performativity of materials in learning: The learning-whole in action. *Journal of New Approaches in Educational Research*, *10*(1), 28–42.
[12] Chen, C. W. K., Chen, C., & Shieh, C. (2020). A study on correlations between computer-aided instructions integrated environmental education and students' learning outcome and environmental literacy. *EURASIA Journal of Mathematics, Science and Technology Education*, *16*(6), 1–7.
[13] Chen, H., Hao, Y., Li, J., & Song, X. (2018). The impact of environmental regulation, shadow economy, and corruption on environmental quality: Theory and empirical evidence from china. *Journal of Cleaner Production*, *195*, 200–214.
[14] Chen, I. C. (2018). Incorporating task-based learning in an extensive reading programme. *ELT Journal*, *72*(4), 404–414.
[15] Cutrone, P., & Beh, S. (2018). Investigating the effects of task-based language teaching on Japanese EFL learners' willingness to communicate. *The Journal of Asia TEFL*, *15*(3), 566–589.
[16] Dailey, A. (2009). *Implementing task-based language teaching in Korean classrooms*. University of Birmingham.
[17] Demir, B., & Sönmez, G. (2021). Generation Z students' expectations from English language instruction. *Journal of Language and Linguistic Studies*, *17*(spesial issue 1), 683–701.

[18] Demirkaya, H. (2020). An investigation of prospective teachers' attitudes towards national parks and views on ecology-based environmental education. *Journal of Educational Issues*, *6*(2), 59–86.

[19] East, M. (2019). Sustaining innovation in school modern foreign language programmes: teachers' reflections on task-based language teaching three years after initial teacher education. *Language Learning Journal*, *47*(1), 105–115.

[20] Egbert, J. L., Abobaker, R., Bekar, M., Shahrokni, S. A., Bantawtook, P., Roe, M. F., … Huh, K. (2021). Language task engagement: An evidence-based model. *TESL-EJ*, *24*(4), 1–34.

[21] Ellis, R. (2009). *Task-based language learning and teaching*. Oxford: Oxford University Press.

[22] Ellis, R., & Shintani, N. (2014). *Exploring language pedagogy through second language acquisition research*. New York, NY: Routledge.

[23] Ferrucci, E., & Rullani, F. (2020). Re-designing knowledge production in the post- Covid-19 era. A task- based approach. *Department of Management, Università Ca'Foscari Venezia Working Paper*, *2*.

[24] Flores, A. M. (2020). Utilizing folktales as culture-specific schemata to promote English as a Second Language (ESL) and English as a Foreign Language (EFL) reading fluency. *The Journal of the Faculty of Foreign Studies, Aichi Prefectural University*, *52*, 343–352.

[25] Frolova, E. V, Rogach, O. V, Tyurikov, A. G., & Razov, P. V. (2021). Online student education in a pandemic: New challenges and risks. *European Journal of Contemporary Education*, *10*(1), 43–52.

[26] Gafurov, I. R., Ibragimov, G. I., Kalimullin, A. M., & Alishev, T. B. (2020). Transformation of higher education during the pandemic: pain points. *Higher Education in Russia*, *10*, 101–112.

[27] González-Lloret, M., & Ortega, L. (2014). *Technology-mediated TBLT: Researching technology and tasks (Vol. 6)*. Amsterdam: John Benjamins.

[28] Gül, D., & Costu, B. (2021). To what extent do teachers of gifted students identify inner and intermodal relations in knowledge representation ? *Mimbar Sekolah Dasar*, *8*(1), 55–80.

[29] Hamalosmanoğlu, M., Kızılay, E., & Saylan Kırmızıgül, A. (2020). The effects of using animated films in the environmental education course on prospective teachers' behavior towards environmental problems and their attitude towards solid waste and recycling. *International Online Journal of Education and Teaching (IOJET)*, *7*(3), 1178–1187.

[30] Hiromori, T. (2021). Are two heads better than one? Comparing engagement between pairs and individuals in an L2 writing task. *Research Quarterly*, *21*, 66–83.

[31] Ho, P. V. P., & Huyen, D. T. (2020). task-based vs. presentation-practice production instructional methods on students' productivity skills. *Journal Of Southwest Jiaotong University*, *55*(3), 1–11.

[32] Hollstein, M. S., & Smith, G. A. (2020). Civic environmentalism: Integrating social studies and environmental education through curricular models. *Journal of Social Studies Education Research*, *11*(2), 223–250.

[33] Ifeduba, R. N., Onyebuch, G. C., & Egwuatu, I. T. (2022). Effect of task-based learning on secondary students' academic achievement and interest in English Language Learning in Anambra State. *Studies in Literature and Language*, *24*(1), 58–64.

[34] Ilhan, G. O., Kaba, G., & Sin, M. (2021). Usage of digital comics in distance learning during COVID-19. *COVID-19. International Journal on Social and Education Sciences (IJonSES)*, *3*(1), 161–179.

[35] Indriyani, V., & Ramadhan, S. (2017). The development teaching of writing fable text module with project based learning (PjBL) containing characters. In *Advances in Social Science, Education and Humanities Research* (Vol. 104, pp. 16–21).

[36] Irfan, I. (2017). The effect of task-based language teaching on students' reading comprehension. *English Education Journal (EEJ)*, *8*(1), 68–70.

[37] Jeon, I. J., & Hahn, J. W. (2006). Exploring EFL teachers' perceptions of task-based language teaching: A case study of Korean secondary school classroom practice. *Asian EFL Journal*, *8*(1), 123–143.

[38] Kamalian, B., Soleimani, H., & Safari, M. (2017). The effect of taskbased reading activities on vocabulary learning and retention of Iranian EFL learners. *The Journal of Asia TEFL*, *14*(1), 32–46.

[39] Kaharuddin, Mardiana, Ahmad, D., Sari, A.A.I. (2022). Examining the skill in writing descriptive text among indonesian learners of english: The effect of Task-based Language Teaching (TBLL). *Journal of Language Teaching and Reasearch*, *13*(1), 46–57.

[40] Kanoksilpatham, B., & Saranakkharin, T. (2019). Tour guide simulation: A task-based learning activity to enchange young Thai learners' english. *Malaysian Journal of Learning and Instruction*, *16*(2), 1–31.

[41] Kanthimathi, S., & Raja, B. W. D. (2021). Covid-19: A challenging enigma to global education. *Shanlax International Journal of Education*, *9*(3), 221–224.

[42] Keyvanfar, A., & Modarresi, M. (2009). The impact of task based activities on the reading skill of Iranian EFL young learners at the beginner level. *He Journal of Apllied Linguistics*, *2*(1), 81–102.

[43] Liu, Y., Mishan, F., & Chambers, A. (2021). Investigating EFL teachers' perceptions of task-based language teaching in higher education in China. *The Language Learning Journal*, *49*(2), 131–146.

[44] Lume, & Hisbullah, M. (2022). The effectivenes of task-based langueege teaching to teach speaking skills. *JOLLT Journal of Languages and Language Teaching*, *10*(1), 85–93.

[45] Malikov, A. V., Potapova, I. I., & Gavrilyuk, E. S. (2020). Adapting University faculty to the challenges of the digital economy. *Journal of Creative Economy*, *14*(6), 1011–1020.

[46] Mao, Z. (2012). The application of task-based language teaching to English reading classroom. *Theory and Practice in Language Studies*, *2*(11), 2430–2438.

[47] Marpa, E. P. (2020). Navigating environmental education practices to promote environmental awareness and education. *International Journal on Studies in Education*, *2*(1), 45–57.

[48] Marques, R., & Xavier, C. R. (2020). The challenges and difficulties of teachers in the insertion and practice of environmental education in the school curriculum. *International Journal on Social and Education Sciences Volume*, *2*(1), 49–56.

[49] Mufliharsi, R., Mayuni, I., & Nuruddin. (2022). Enchancing student's reading experience using task-based flipped classroom in reading course. *Deiksis*, *14*(1), 39–50.

[50] Murat, H., & Hismanoglu, S. (2015). Task-based language teaching: What every EFL teacher should do. In *Procedia Social and Behavioral Sciences 15* (pp. 46–52).

[51] Nunan, D. (2004). *Task-based language teaching*. Cambridge: Cambridge University Press.

[52] Perveen, A. (2021). Use of word clouds for task based assessment in asynchronous. *Maxtesol Journal*, *45*(2), 1–11.

[53] Pinto, V. F., & Totti, M. E. F. (2020). Environmental education and perception about the environment by high school students and teachers. *Journal of Education in Science, Environment and Health (JESEH)*, *6*(3), 169–176.

[54] Plomp, T., & Nienke. (2013). Educational design research: An introduction. In T. P. & N. Nieveen (Ed.), *Educational design research - Part A: An Introduction* (pp. 10–51). Enschede, the Netherlands: SLO.

[55] Priyadarshani, H., & Jesuiya, D. (2021). Teacher's perception on online teaching method during Covid-19: With reference to school level teachers at faculty of education, The Open University of Sri Lanka. *Shanlax International Journal of Education*, *9*(2), 132–140.

[56] Purpura, J. E. (2019). Second and foreign language assessment. *Modern Language Journal*, *100*, 190–208.

[57] Ramadhan, S., Atmazaki, Indriyani, V., Sukma, E. (2022). Digital teaching materials based on Task-Based Language Learning (TBLL) with environmental education: Uses in online distance learning. *Al-Islah: Jurnal Pendidikan*, *14*(3), 4671-4682.

[58] Ramadhan, S., Atmazaki, Sukma, E., & Indriyani, V. (2021). Design of task-based digital language teaching materials with environmental education contents for middle school students. *Journal of Physics: Conference Series*, *1811*, 1–8.

[59] Ramadhan, S., Sukma, E., & Indriyani, V. (2021). Online distance learning while the COVID-19 Pandemic: Implementation, evaluation, adn expectations. In *Advance in Social Science, Education and Humanities Research, vol 604* (pp. 267–275).

[60] Renzulli, J. S., & Reis, S. M. (2014). *The schoolwide enrichment model: A how-to guide for talent development (3rd ed.)*. Wako TX: Prufrock Press.

[61] Rodr ǵuez-pe ñarroja, M. (2022). Integrating project-based learning, task-based language teaching approach and youtube in the esp class: A study on students' motivation. *Teaching English with Technology*, *22*(1), 62–81.

[62] Scristia, Hapizah, Hiltrimartin, C., Saputri, N. W., Jessica, C., Sari, D., & Nurfadilah, F. (2020). The effect of direct learning on strudents' proff construction ability of Palembang High School. *Advances in Social Science, Education and Humanities Research*, *vol. 513*, 635-639, Atlantis Press.

[63] Sholeh, M. B., Salija, K., Syahril, Basri, M., & Dollah, S. (2021). Task- based language teaching: indonesian efl teachers' perceptions. In *Proceeding of National Seminar on Literature, Linguistics and Language Teaching* (pp. 144–155).

[64] Şimşek, M., & Yazıcı, N. (2021). Examining the digital learning material preparation competencies of pre-service mathematics teachers. *Participatory Educational Research (PER)*, *8*(August), 323–343.

[65] Strokov, A. A. (2020). Digitalization of education: problems and prospects. *Bulletin of Minin University*, *8*(2), 1–15.

[66] Styati, E. W., & Khasanah, R. (2021). The impact of task-based activities in reading skill for the students during Covid 19 pandemic. *Journal of English Education Society*, *7*(1), 18–26.

[67] Sun, X. (2022). A study on the application of task-based language teaching approach in english listening class for college english major in China. In *Advances in Social Science, Education and Humanities Research* (*Vol. 637*, pp. 839–842).

[68] Tartavulea, C. V., Albu, C. N., Albu, N., Dieaconescu, R. I., & Petre, S. (2022). Online teaching practices and the effectiveness of the educational process in the wake of the COVID-19 Pandemic. *Amfiteatru Economic*, *22*, 920–936.

[69] Tavstukha, O. G., Osiyanova, O. M., Chelpachenko, T. V., Yudina, A. M., Ovchinnikov, O. M., Illarionova, L. P., … Aleksandrova, N. S. (2021). Counter-pandemic vector of remote learning for university students: Risks and benefits of educational process large-scale digitalization. *Prop ósitos y Representaciones*, *9*(3), 1–6.

[70] Topal, M., Yildirim, E. G., & Onder, A. N. (2020). Use of educational films in environmental education as a digital learning object. *Journal of Education in Science, Environment and Health (JESEH)*, *6*(2), 134–147.

[71] Tsai, C., Cheng, Y., Tsai, Y., & Lou, S. (2021). Impacts of AIOT implementation course on the learning outcomes of senior high school students. *Education Science*, *11*(82), 1–29.

[72] Tsarapkina, J. M. (2021). The formation of bachelors ' digital competencies at the universi. *Prop ósitos y Representaciones*, *9*(1), 1–10.

[73] Van, D. T. H., & Thi, H. H. Q. (2021). Student barriers to prospects of online learning in Vietnam in the context of covid-19 pandemic. *Turkish Online Journal of Distance Education-TOJDE*, *22*(3), 1–16.

[74] VanTassel-Baska, J. (2011). An introduction to the integrated curriculum model. In J. V.-B. & C. A. Little (Ed.), *Content-based curriculum for high-ability earners (2nd ed)* (pp. 9–32). Wako TX: Prufrock Press.

[75] Vercellotti, M. Lou, & Mccormick, D. E. (2021). Constructing analytic rubrics for assessing open-ended tasks in the language classroom. *TESL-EJ*, *24*(4), 1–19.

[76] Willis, J. (2016). *A framework of task-based learning. London: Longman Hemseler Books*. London: Longman Hemseler Books.

[77] Yazdi, M. (2012). E-learning sebagai media pembelajaran interaktif berbasis teknologi informasi. *Jurnal Ilmiah Foristek*, *2*(1), 143–152.

[78] Yeşilyurt, M., Özdemir Balakoğlu, M., & Erol, M. (2020). The impact of environmental education activities on primary school students' environmental awareness and visual expressions. *Qualitative Research in Education*, *9*(2), 188–216.

[79] Zakharova, V. A., Chernov, I. V., Nazarenko, T. I., Pavlov, P. V., Lyubchenko, V. S., & Kulikova, V. S. (2020). Social health and environmental behavior of students in the digital age. *Cypriot Journal of Educational Sciences*, *15*(5), 1288–1294.

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