

THE UTILIZATION OF DUOLINGO TO BOOST STUDENTS' GRAMMAR MASTERY IN SENIOR HIGH SCHOOL

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^{1*}Dian Fadhilawati, ²Moh Mansur, ³Suyitno
¹⁻³ Balitar Islamic University, ² MAN Kota Blitar

Abstract— *This classroom action research utilized Duolingo to enhance the grammar mastery of 31 senior high school students in Reported Speech. The research procedures cover; planning, acting, observing, and reflecting. The researchers collected data through tests. The results demonstrated a significant improvement in students' grammar of Reported Speech mastery, with test average scores increasing from 56.77 to 85.16. Regarding the result, teachers are suggested to integrate technology-based learning tools like Duolingo to create engaging and interactive learning environments and enhance students' mastery. However, it is important to note that individual student progress varied, and some students showed more substantial improvements compared to others. Further analysis and consideration of factors such as individual learning styles, frequency of Duolingo usage, and additional instructional support may help understand the variations in student performance.*

Keywords—*Duolingo, Grammar, Reported Speech*

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Correspondence Author:

Dian Fadhilawati,
English Education Department,
Balitar Islamic University
Email: dianfadhilawati@yahoo.com

I. INTRODUCTION

The Instruction of English as a foreign language (EFL) at every level of education in Indonesia required students to master four skills, they are skills for communicating using English with others in oral form, Skills for comprehending the English text or passage, skills for expressing their thought, and ideas in English writing as well as skills of conveying the message from English monologue or dialogue that they listen to [1]. Besides it also encompasses various linguistic aspects, in which grammar plays a crucial role in achieving proficiency [2]. Learning grammar is of paramount importance in the context of mastering writing, speaking, reading, and listening skills for example; Grammar serves as the foundation of language structure, enabling effective communication and comprehension across all language modalities [3]. Grammar is a pivotal aspect of writing [4]. A solid understanding of grammar ensures clarity and coherence, properly structured sentences, accurate verb tenses, appropriate word order, and the correct use of punctuation to facilitate effective written communication. Without a strong grasp of grammar, written messages may be confusing, ambiguous, or fail to convey the intended meaning. Grammar provides the necessary tools to express ideas, thoughts, and arguments coherently, allowing the writer to engage the reader effectively.

Similarly, in speaking, grammar plays a vital role in conveying meaning accurately [5]. Grammatical structures enable speakers to construct meaningful and intelligible sentences, ensuring effective communication. By understanding and applying grammar rules, speakers can express themselves with precision, coherence, and fluency. In addition, having a strong mastery of grammar allows speakers to convey their thoughts and ideas in a way that listeners can understand easily. Even in oral communication, having a basic understanding of grammar is essential to ensure an effective understanding between the speaker and the listener. While a lack of grammatical proficiency may not necessarily hinder communication completely, having a shared knowledge of grammar rules helps to establish a common language code. It allows both the speaker and the listener to convey their thoughts and ideas more accurately, reducing the chances of misinterpretation or confusion. Grammar provides a framework for organizing words, phrases, and sentences, enabling clear and coherent communication between individuals [4].

Moreover, grammar is essential for students in mastering reading comprehension [6]. When reading texts, a solid understanding of grammar helps students interpret and understand the author's intended message in the text they read. Grammar guides students in identifying sentence structure, verb agreements, word usage, and other grammatical cues that shape the meaning of the text. Further, understanding grammar enhances reading comprehension by allowing students to navigate complex sentence structures, identify relationships between words and phrases, and extract the intended information from written materials. Additionally, grammar is integral to effective listening skills. [7] When listening to spoken language, knowledge of grammar aids in understanding the structure, meaning, and nuances of the spoken message. Recognizing grammatical patterns and cues assists listeners in following conversations, comprehending information, and extracting key details. Without a grasp of grammar, students may struggle to decipher the intended meaning, resulting in misinterpretation or incomplete understanding.

Despite the importance of grammar in supporting the mastery of students' four English skills, learning grammar poses significant challenges for many EFL students [[8];[9]]. The complex rules, exceptions, and nuances inherent in grammar structures make it a daunting task. Grammar instruction is often deemed difficult due to its intricate nature. Students encounter difficulties in understanding and applying grammar rules due to factors such as the abstract nature of grammatical concepts, the presence of numerous exceptions, and the need for precise usage in context.

One of the Grammar materials that students learn in class XII is Reported speech. Reported speech is a grammatical aspect requiring students to transform direct speech into indirect speech, which presents a particular challenge for language learners. It is a commonly used technique to convey the thoughts, words, and beliefs of others without directly quoting them verbatim, it allows for the reporting of the essence and content of what was said or thought, rather than providing an exact replication of the original statement. Further, there are two primary methods of reporting: direct speech, where the exact words are quoted, and reported speech, which paraphrases the original statement. Reported speech is frequently employed in various forms of communication such as newspaper reports, fictional narratives, and both spoken and written conversations, enabling individuals to convey the ideas and information expressed by others in their own words [10]. Referring to the block test outcome under the topic of reported speech, the

student’s mastery related to reported speech was not good (57.77). The student’s mastery of reported speech was under the minimum standard required (75.00) The students’ complexities in mastering reported speech covered; understanding the changes required in verb tenses, pronouns, adverbs of time, and the word order among other elements. Students were struggle with accurately applying these transformations, resulting in errors and a lack of confidence in using Reported Speech. Those students’ challenges of learning reported speech in XII Social 3 in MAN Kota Blitar are exemplified in the following table;

Table 1. The Challenges of Students in Learning Reported Speech

| No | Direct Speech | Students Answers | Correct Answers | Explanation |
|----|---|--|---|---|
| 1 | Dina: said, “I love writing.” | Dina said that she loves writing. | Dina said that she loved writing. | In case, students need to understand the change in verb tense from "love" to "loved" when reporting the statement in Reported Speech. |
| 2 | "He said, 'I will study for the exam.'" | He said that he will study for the exam. | He said that he would study for the exam | Here, students need to grasp the shift in verb tense from "will" to "would" when reporting a future action in Reported Speech. |
| 3 | "They said, 'We are going to the theater.'" | They said we are going to the theater | They said that they were going to the theater | Here, students need to understand the alteration of the Subject; ,“We“ to |

| | | | | |
|---|--|---|--|---|
| | | | | ,“They“ and the verb phrase "are going" to "we're going" to match the past context in Reported Speech. |
| 4 | "He asked, 'Did you finish your task ?'" | He asked if I had finished your task. | He asked if I had finished my task | In this example, students need to comprehend the transformation of the question form "Did you finish your task." to the reported question "If I had finished my task." in Reported Speech |
| 5 | Mrs. Rina said, "I have finished my book, and you can start yours ." | Mrs. Rina said that I have finished my book, and you can start yours" | Mrs. Rina Said that She has finished her book and I could start mine | In this example, the pronouns "I" and "you" should be changed to "she" and "I" and the possessive pronoun “my” become “her” and “yours” become “mine” respectively to match the subject and possessive form in the reported speech. |

| | | | | |
|---|--|--|---|---|
| 6 | John Said, "I will meet you tomorrow." | He said that "He would meet you tomorrow." | He said that he would meet me the next day. | In this case, the time expression "tomorrow" indirect speech is changed to "the next day" in a reported speech to maintain temporal accuracy and reflect the perspective of the original speaker. |
|---|--|--|---|---|

Those examples of sentence errors highlighted students' challenges at XII Social 3 when they learned Reported Speech covered. Those Challenges covered: 1) Verb Tense Changes: Reported speech often requires shifting verb tenses to reflect the perspective of the original speaker and the time of the reported statement. This can be challenging for students who struggle with understanding and applying different verb tenses accurately, 2) Pronoun and Word Order Changes: In reported speech, pronouns and the word orders may need to be adjusted to match the perspective of the original speaker. This can be confusing for students, particularly when there are multiple pronouns involved or when the word orders change significantly from direct speech, 3) Reporting Verbs and Introducing Phrases: Students may find it challenging to choose appropriate reporting verbs and introduce phrases to accurately convey the reported speech. Selecting the right reporting verb and phrase can affect the meaning and clarity of the reported statement, 4) Understanding Indirect Questions and Commands: Reporting indirect questions and commands can be complex. Students may struggle with transforming direct questions or commands into reported speech while maintaining the intended meaning and politeness, and 5) Time transformation. In this case, time transformation in reported speech is challenging because it involves altering verb tenses, adjusting time adverbs, and modifying modal verbs and auxiliary verbs to accurately convey when the reported speech occurred relative to the reporting speech. Additionally, handling conditional statements, reported questions and pronoun changes adds complexity.

To address these challenges, English teachers who teach grammar must utilize appropriate media and resources to engage students' engagement in learning the materials, overcoming the students' difficulties, and improving their mastery of reported speech. One of the digital media that can be applied to overcome students' problems is Duolingo. It is a widely recognized language-learning media, that provides an interactive and gamification approach to language instruction. It provides a range of exercises, quizzes, and interactive lessons that can be customized to target specific grammar structures. By incorporating Duolingo into the classroom, teachers can leverage its advantages, such as interactive exercises, immediate feedback, and engaging content, to enhance students' grammar mastery. In addition, Duolingo is a widely accessible platform that can be used on various devices, including smartphones, tablets, and computers. This allows students to conveniently access the platform anytime and anywhere, making it highly flexible for their learning needs [11]. Further, Duolingo has a premium version that offers free advertisements for the users, ease the users to download lessons for offline use, unlimited feedback for mistakes, unlimited skill test-outs even without an internet connection, monthly streak repair to maintain uninterrupted progress, and a progress/mastery quiz for self-assessment. These features enhance the language learning experience by providing convenience, flexibility, and personalized feedback to dedicated language learners [11].

Prior research had consistently demonstrated the positive impact of integrating Duolingo into language education, highlighting its potential to enhance students' motivation, engagement, and language learning outcomes. For instance, [12] found that the utilization of Duolingo effectively enhanced the eighth-grade students' vocabulary mastery at MTSN 13 Jakarta. In addition, [13] reported that both teachers and students perceived Duolingo as an effective tool for learning English, noting improved motivation, completion of English assignments, and enhanced language skills at Methodist Schools. Moreover, [14] revealed that Duolingo enhances students; motivation in learning English. While [15] highlighted how Duolingo facilitated vocabulary enhancement and highlighted that Duolingo facilitated students enhance their vocabulary. [16] found that Duolingo enhanced listening skills among junior high school students. Further, [17] reported that Duolingo effectively improved students' speaking abilities in SMP.

Referring to the identified challenges encountered in learning reported speech, the positive findings from previous studies regarding the efficacy of Duolingo in language

learning, and it is noteworthy that there is a scarcity of research specifically exploring the utilization of Duolingo for improving grammar mastery, the researchers embarked on a study entitled "Utilizing Duolingo to Boost Students' Grammar Mastery in Senior High School." The particular focus of this research was to know the students' grammar mastery improvement of reported speech in Class XII Social 3 at MAN Kota Blitar after the implementation of Duolingo in grammar instruction.

II. METHOD

This research applied classroom action research to improve 31 students' grammar mastery of reported speech in class XII Social at MAN Kota Blitar by Utilizing Duolingo in Grammar Instruction. The Procedures cycle of this research followed 4 steps by Kemmis and Taggart that covered 1) Planning the Action, 2) Implementing the Action, 3) Observing the Action, and 4) Reflecting on the Action Taggart [18]. Those steps are elaborated as follows:

Planning the Action

During the planning phase, the researchers meticulously organized the research timeline and the sequence of activities [19]. They developed a comprehensive lesson plan that integrated the use of Duolingo, specifying reported Speech, instructional strategies to be employed, and the assessment methods to measure students' progress. Additionally, the researchers ensured that the necessary resources, such as computers or mobile devices with internet access, were readily available for the students to effectively utilize Duolingo. Furthermore, they prepared a post-test as part of the assessment process and set specific success criteria for research. In this study, the success of students in learning reported speech was determined by individual scores, where a minimum score of 75.00 indicated successful intervention, and the class average also needed to reach 75.00 for overall achievement.

Implementing the Action

The implementation phase involved putting the planned activities into action [20]. The researchers introduced Duolingo as a supplementary tool in grammar instruction, integrating it into regular classroom sessions. The researchers guided the students in

accessing and using the Duolingo platform, explaining its features and functionalities. The students were given individual accounts on Duolingo to track their progress and provide personalized learning experiences. During the implementation, the researchers facilitated interactive and engaging activities that focused on reported speech, utilizing Duolingo as a supportive tool. They also organized group discussions, exercises, and interactive tasks to reinforce the student's understanding and application of reported speech concepts. The researchers closely monitored the students' engagement with Duolingo and provided guidance and support whenever needed.

Observing the Action

The observation phase focused on close monitoring and assessing the student's mastery of reported speech after utilizing Duolingo. To evaluate their achievement, the researchers administered a grammar test consisting of 50 multiple-choice items. The students were given 90 minutes to complete the test. Each item was scored 2 points, resulting in a total possible score of 100. To calculate the students' achievement, the researchers utilized the mean score formula. This involves summing up the individual scores of all students and dividing them by the total number of students. By applying this formula, the researchers obtained an average score that provided insights into the overall performance and mastery of reported speech among the students.

Reflecting the Action

During the reflection phase, the researchers critically examined the learning outcomes of the students regarding reported speech, taking into consideration the success criteria established during the planning phase. According to these criteria, if the individual scores of the students reached a minimum of 75.00 and the class's mean score surpassed 75.00, the researchers would stop the study in the first cycle. However, if the predetermined success criteria were not met, the researchers would proceed to the second cycle, aiming to enhance the areas that were identified as lacking during the initial cycle. This iterative approach allowed the researchers to adapt and refine their instructional strategies to ensure continuous improvement and optimal learning outcomes.

III. RESULT AND DISCUSSION

This part highlights the outcomes of the students' grammar mastery of reported speech both before and after the incorporation of Duolingo in Grammar instruction. The researchers present these findings and subsequently engage in a thorough discussion, comparing them with previous studies in the field. By doing so, the researchers aim to provide a comprehensive analysis of the impact of utilizing Duolingo on students' grammar proficiency in reported speech, drawing upon existing research to contextualize and further understand the observed outcomes

The Results of Students' Grammar Mastery of Reported Speech Before and After the Utilization of Duolingo in Teaching-Learning Grammar of Reported Speech

The outcomes of reported speech before and after the utilization of Duolingo in learning Grammar are presented in Table 2 as follows:

Table2. The Students' Outcomes of Grammar in Reported Speech Before and after the utilization of Duolingo in Teaching-Learning of Reported Speech

| Students' Initial | Pre-action Test Result | Post-Action Test Result |
|--------------------------|-----------------------------------|------------------------------------|
| AUMIS | 56 | 84 |
| AAF | 72 | 90 |
| AFAP | 60 | 88 |
| AAH | 48 | 78 |
| BN | 74 | 94 |
| CNR | 66 | 90 |
| DL | 56 | 86 |
| DBAS | 54 | 82 |
| FAR | 60 | 88 |
| HES | 48 | 80 |
| ISA | 50 | 84 |
| ID | 48 | 80 |
| KKZAF | 54 | 82 |

| | | |
|-------------------|--------------|--------------|
| L | 58 | 86 |
| MDY | 50 | 80 |
| MAF | 60 | 86 |
| MSA | 78 | 94 |
| MHM | 65 | 90 |
| MH | 72 | 92 |
| NSA | 48 | 78 |
| NK | 60 | 88 |
| NAJ | 46 | 76 |
| NF | 62 | 90 |
| NM | 52 | 82 |
| SAAK | 54 | 84 |
| SAR | 64 | 88 |
| SEAR | 44 | 78 |
| VUF | 62 | 88 |
| YZS | 48 | 80 |
| YW | 58 | 84 |
| ZAB | 64 | 90 |
| Mean Score | 57.77 | 85.16 |

The table presents the 31 students' learning outcomes in the area of reported speech before and after utilizing Duolingo as a tool for grammar instruction. The initial or pre-action test results indicate the students' scores before intervention, while the post-action test results represent their scores after the implementation of Duolingo Application. Looking at individual student scores, it can be observed that in cycle 1, there was an improvement in the majority of the student's performance from the pre-action test to the post-action test. The overall average score of the students enhanced from 57.77 in the pre-action test to 85.16 in the post-action test. This result indicates that the utilization of Duolingo in grammar instruction had a positive impact on the students' grammar mastery of reported speech. That result reflected that the student's mastery of reported speech has achieved the criterion of success of research. Therefore, the researchers did not need to continue to the next cycle.

Discussion

The research finding which showed that Duolingo utilization boosted the students' grammar mastery of reported speech from 57.77 to 85.16 aligns with [16] and [17] findings indicating that integrating interactive and engaging platforms like Duolingo can enhance the students' language proficiency either skills or sub-skills. The significant improvements observed in the students' scores highlight the potential of utilizing such tools to reinforce grammar concepts and facilitate more effective learning outcomes through regular exercises of the materials that must be mastered. Furthermore, the condition in which the students were taught by using Duolingo that employed gamification techniques, such as leveling up, earning points, and competing with friends, make their learning experience engaging and enjoyable, because they felt a situation of joyful learning it might affect to the increasing of their learning outcomes This gamified approach can motivate students to actively participate and continue their learning journey [14].

Besides, by learning Grammar through Duolingo the students can learn the lessons in bite-sized formats, breaking down grammar concepts into manageable chunks. This approach allows students to learn at their own pace and provides them with a sense of progress as they complete each lesson, further, the Duolingo platform utilizes adaptive algorithms that track students' progress and tailor subsequent lessons based on their performance. This personalized approach ensures that students receive targeted practice and feedback, focusing on areas where they need improvement. Duolingo provides a variety of interactive exercises, including fill-in-the-blanks, translation, and listening comprehension activities. These exercises provided by researchers allow students to practice applying grammar rules in a practical context, enhancing their understanding and retention of the material.

In addition, Duolingo offers immediate feedback on students' responses, highlighting correct answers and providing explanations for incorrect ones. This prompt feedback helps students identify and correct grammar mistakes, reinforcing their learning and facilitating self-correcting, and allows students to track their progress and monitor their achievements. They can see their completed lessons, earned badges, and overall skill development, providing a sense of accomplishment and motivation to continue learning. It is agreed with [11] who argued that Duolingo offers an ad-free experience, the ability

to download lessons for offline use, unlimited hearts for mistake-free learning, unlimited skill test-outs even without an internet connection, monthly streak repair to maintain uninterrupted progress, a progress/mastery quiz for self-assessment. These features enhance the language learning experience by providing convenience, flexibility, and personalized feedback to dedicated language learners

Moreover, it is important to note that individual student progress varied, and some students showed more substantial improvements compared to others. Further analysis and consideration of factors such as individual learning styles, frequency of Duolingo usage, and additional instructional support may help understand the variations in student performance. Overall, the results demonstrate the positive impact of incorporating Duolingo as a tool in grammar instruction, as evidenced by the increased scores and improved mastery of reported speech among the students. These findings contribute to the existing body of research on effective language learning strategies and emphasize the potential benefits of technology-enhanced language instruction.

IV. CONCLUSION AND SUGGESTIONS

In conclusion, the utilization of Duolingo could enhance the students' Grammar mastery of reported speech at social three of class 12 in MAN Kota Blitar. The finding revealed a significant improvement in students' mastery of Reported Speech, as evidenced by the increase in scores from the pre-action test to the post-action test. The study underscores the importance of employing appropriate and innovative media in teaching grammar, such as Duolingo, to enhance students' learning outcomes. Based on the findings and the challenges identified during the research, several suggestions can be made for future researchers and teachers. Firstly, it is recommended English Teachers continue exploring and integrating technology-based platforms like Duolingo in grammar instruction to further enhance students' engagement and mastery. Additionally, teachers should provide explicit instruction on reported speech, focusing on verb tense changes, pronoun adjustments, and adapting time expressions. Offering ample practice opportunities and providing targeted feedback will help students consolidate their understanding and application of reported speech. Furthermore, future research can investigate the long-term effects of utilizing Duolingo or similar platforms in grammar

instruction and explore its potential benefits for other language skills, such as writing and speaking. By continuously exploring innovative teaching methods and utilizing appropriate media, educators can create a dynamic learning environment that promotes effective grammar acquisition and overall language proficiency.

REFERENCES

- [1] Y. Wulandari and D. Fadhilawati, "Developing Adobe Flash as a Learning Media To Increase the First Grade Students' Speaking Achievement at Junior High School in the 2018/2019 Academic Years," *Josar*, vol. 1, no. 1, pp. 84–95, 2019.
- [2] D. Fadhilawati, A. Khan, D. L. Rachmawati, and M. Mansur, "Tackling and Handling Students ' Grammar Mastery on Passive Voices in a Higher Education : Quizzes Application Power," *Veles*, vol. 6, no. 2, pp. 379–391, 2022.
- [3] E. C. Sioco and P. V. De Vera, "Grammatical competence of Junior High School students," *TESOL Int. J.*, vol. 13, no. 2, pp. 82–94, 2018.
- [4] A. Rossiter, "The importance of Grammar," *Linguapress*, 2021. <https://linguapress.com/grammar/importance-of-grammar.htm>.
- [5] P. Kumar Debata, "The Importance of Grammar in English Language Teaching: A Reassessment," *Lang. India* www.languageinindia.com, vol. 13, no. 5, 2013, [Online]. Available: www.languageinindia.com.
- [6] R. E. Putri, "The Relationship Among Students' Reading Strategy, Grammar Awareness and Their Reading Comprehension," Universitas Islam Syarif Hidayatullah Jakarta, 2022.
- [7] D. S. Dewi, "Grammatical Knowledge : Does It Affect Listening Comprehension ?," *Anglo-Saxon*, vol. 8, no. 2, pp. 152–157, 2017.
- [8] M. R. Aziz, D. Fadhilawati, and N. Sutanti, "The Effectiveness of Quizizz Application to Increase Students' Grammar Achievement," in *7th ELTT Conference*, 2021, pp. 179–189.
- [9] D. Fadhilawati, "Improving the Students' Grammar Achievement on Conditional Sentences by Using Memrise," *Langlit An Int. Per-Reviewed Open Access J.*, vol. 5, no. 4, pp. 83–95, 2019.
- [10] C. D. Miranti, "Students ' Difficulties in Learning Reported Speech," Universitas Islam Negeri Ar- Raniry Banda Aceh, 2020.

- [11] L. Camille Davalos Perez, “English Language Acquisition Via Duolingo Application: Effectivity and Challenges,” *J. English Teach. Stud.*, vol. 2, no. 2, pp. 76–87, 2020.
- [12] M. F. Zamzami, *The Effect of Using Duolingo Application Through Students’ Vocabulary Mastery*. 2019.
- [13] Fauzan and U. Kasim, “Exploring the Implementation of Duolingo Media for Assignment in Learning English,” *English Educ. J.*, vol. 11, no. 2, pp. 288–301, 2020.
- [14] A. Habibie, “Duolingo as an Educational Language tool to Enhance EFL Students’ Motivation in Learning English,” *British, J. Bhs. dan sastra Ingg.*, vol. 9, no. 1, pp. 13–26, 2020.
- [15] A. N. Cesarini, N. Sulaiman, S. S. Mulyana, and V. Yolandri, “Utilizing Duolingo in Learning Vocabulary,” in *Proceedings International Conference on Education of Suryakencana 2021*, 2021, pp. 109–117.
- [16] U. J. Rosyidah, E. D. Laksmi, M. Anugerahwati, U. N. Malang, U. N. Malang, and U. N. Malang, “Gamification in Duolingo App on Improving English Listening Proficiency of JuniorHigh School Students,” *ENGLISH Fr. Acad. J. English Lang. Educ.*, vol. 7, no. 1, pp. 119–132, 2023, doi: 10.29240/ef.v7i1.5377.
- [17] Y. Dearestiani, A. Rohman, and W. S. Pane, “Improving Students’ Speaking Skills by Using Duolingo Application,” *Inq. Jpurnal*, vol. 01, no. 02, pp. 155–162, 2023.
- [18] S. Khasinah, “Classroom Action Research,” *Pionir*, vol. 1, no. 1, pp. 107–114, 2013, [Online]. Available: <http://www.banber.eiu.am/index.php/banber/article/view/158%0Ahttp://www.banber.eiu.am/index.php/banber/article/download/158/166>.
- [19] D. Fadhilawati, “Learning and Reviewing Vocabulary Through Memrise To Improve Students’ Vocabulary Achievement,” *JARES.*, vol. 1, no. 2, p. 4, 2016, doi: 10.30957/jares.v1i2.419.
- [20] M. Mansur and D. Fadhilawati, “Enhancing the Students’ Grammar Achievements of Conditional Sentences By Using Quizizz Platform in Senior High School,” *JARES (Journal of Academic Research. and Science.*, vol. 6, no. 2, pp. 1–10, 2021, [Online]. Available: <https://ejournal.unisbablitar.ac.id/index.php/jares>.

