

THE EFFECTIVENESS OF LEARNING BY TEACHING (LBT): A CASE OF JUNIOR HIGH SCHOOL STUDENTS STUDYING TENSES

Michael Setiawan

English Departement, Faculty of Humanities, Bina Nusantara University
Jl. Kemanggisian Ilir III No. 45, Palmerah, Jakarta 11480, Indonesia
msetiawan.jwc@binus.edu

Received: 08th October 2018/ Revised: 16th January 2019/ Accepted: 29th January 2018

How to Cite: Setiawan, M. (2019). The effectiveness of learning by teaching (LBT): A case of junior high school students studying tenses. *Humaniora*, 10(1), 19-23. <https://doi.org/10.21512/humaniora.v10i1.5038>

ABSTRACT

This research aimed to see if learning by teaching (LBT) could really be implemented in classrooms. This case study intended to discover if LBT was applicable to teach tenses. This quantitative research involved 50 students from the two of 8th grade classes in one junior high school in Jakarta, one of which acted as the control group and the other one as the experimental group. This research focused on the learning of five tenses, namely the simple present tense, the simple past tense, the simple future tense, the simple present continuous tense, and the simple present perfect tense. A pre-test was employed before the research started and after the treatment had been given to the experimental group, a post-test was given a week after, and another post-test was given three months later. The results show that LBT helps the subjects learn better. Moreover, they also remember their materials longer. Therefore, LBT can be a good student-centered activity which has been proven successful.

Keywords: learning by teaching, student-centered learning, teaching method, English terms

INTRODUCTION

Teachers used to have the most authoritative roles in classes. They are the sources of knowledge for their students. Instead of initiating a discussion and engaging students in the discussion, teachers are more comfortable to teach and talk to the students who will passively listen. This long practice has been ongoing in Indonesia for a very long time. As a result, students have become accustomed to being spoon-fed. They have become passive learners who accept what their teachers tell them (Faridi, Bahri, & Nurmasitah, 2016), and they are not voluntarily willing to find information by themselves (Exley, 2005). In addition, they cannot manage their own learning processes as their teachers control all the learning aspects, including how the lessons are delivered, as stated by Ahmed (2013).

However, the Indonesian 2013 curriculum is introduced to mark a dramatic shift in teaching-learning interactions in classes across the archipelago. The curriculum strongly urges teachers to apply a student-centered approach in all classrooms in Indonesia. Teacher-centered learning is expected to be left behind when student-centered learning starts to take its place in classes. Teachers have to withdraw from their role as teachers who know everything and become their students' partners and facilitators who are there to help their students through their learning process (Wangid, 2014). Teacher-centered learning is believed to be responsible for creating students who are passive, dependent, and not

creative. The shift is expected to make some changes in the characteristics of students in Indonesia. Aiming to improve the quality and the perseverance of students, student-centered learning, which is implemented in the 2013 curriculum, is supposed to help make students active, autonomous, and creative learners (Retnawati, Hadi, & Nugraha, 2016).

Student-centered learning is believed a good move for students. This approach helps students improve their higher-order skills. Instead of just being able to memorize their learning materials, students can also be benefited in getting accustomed to doing research (Asoodeh, Asoodeh, & Zarepour, 2012). In addition, students also learn how to be responsible and in full control of their own learning. This approach, as mandated in the 2013 curriculum, also encourages students to be actively involved in the learning process and limits teachers' role as a facilitator only (Tahir, 2017). Teachers should be one of the sources of knowledge, but not the only source. That means they also have to encourage their students to learn and become information seekers (Lestari & Widjajakusumah, 2009; Wangid, 2014). In addition, teachers have to be there to guide their students through their process to acquire knowledge (Duran, 2017). Moreover, besides being facilitators to their students, teachers have another essential role which is ensuring that students really learn what they have to learn and that they can be encouraged to actively learn (Garrett, 2008).

To fulfill the expectations of the Indonesian 2013 curriculum, teachers have tried to implement activities to

promote student-centered learning, from group discussions to presentations which become the focal point of student-centered learning activities. Teachers assume that assigning presentations means implementing student-centered learning. Nevertheless, presentations are actually not deemed as a good student-centered learning activity. Students tend to present quickly without understanding or remembering the content. They do not care if their friends understand their material or not and do not encourage any interactions with their peers (Aslan, 2015). Moreover, presentations can be categorized as a knowledge-telling activity which does not give many contributions to learning (Roscoe, 2014). Telling knowledge surely impacts the presenters' learning process in the form of fixed memorization, but they can gain more and understand deeper when they build knowledge (Duran, 2017).

As classrooms are trying to shift from a teacher-centered approach to a student-centered approach and presentations which are mostly used as a new method to suit the new approach are not actually suitable for a student-centered approach, teachers should urgently find the right student-centered activity which can be applied as an effective learning method. A method introduced by Jean-Pol Martin around two decades ago, learning by teaching, can be introduced as a student-centered learning activity which builds knowledge instead of just telling knowledge. The application of learning by teaching requires that students assume full responsibility in the teaching role. The basic principle of learning by teaching or *lernen durch lehren* is to hand over the teaching responsibility to students and also to encourage students to deliver the lessons in a more active and communicative way (Grzega, 2006).

Unlike mere presentations in which students do not really care with the teaching-learning process and outcomes, learning by teaching is more on peer teaching which is usually conducted in a big class setting. This method gives students some authority to decide their own delivery methods and approaches to teach their peers (Cherney, 2011). It allows students to contribute to teaching methods with their own perspectives. In addition, when students teach what they have already prepared including making connections to their prior knowledge, they will learn a lot about the topic that they are going to teach and gain a deeper understanding of the materials (Fiorella & Mayer, 2013). Preparing to teach gives students some responsibility and forces them to thoroughly comprehend the materials (Biswas et al., 2005). Another benefit of learning by teaching is that this approach helps build interactions between student teachers and those who are taught. These interactions encourage student-teachers to answer questions or integrate their knowledge to answer questions (Aslan, 2017). Planning, explaining, and interpreting students' questions and feedback help students who are teaching to understand better by encouraging "reflection, self-explanation, and studying for understanding (rather than memorizing) which lead to better knowledge organization and schema structure" (Lenat & Durlach, 2014).

On the other hand, teachers assume new roles which they have never applied during teacher-centered learning. Acting as facilitators, teachers support and assist students throughout their preparations and help when students encounter problems (Königs, 2003). Teachers have to avoid telling students all the information, such as the approach they can use and the materials they will teach. Teachers encourage students to find all the information independently. Thus, learning by teaching helps students reach their high-

order thinking skills and learn how to solve problems in various situations when they do everything by themselves, and not be dependent on their teachers (Gutman, 2017).

A success story of learning by teaching has been recorded in the United States of America. Previous research by Fiorella and Mayer (2014) has found that subjects are preparing to teach performed better than subjects preparing for a test when they have to take a test. Even more, they state that subjects preparing to teach will gain some benefits, but those who teach will benefit more, especially for long-term learning. Fiorella and Mayer's research confirms the study of Bargh and Schul (as cited in Biswas et al., 2005) that those who teach others to take a quiz perform better than those who only prepare to take the quiz. Another research is conducted in Sudan. Previous research by Ahmed (2013) has found that learning by teaching helps his subjects improve their linguistic competence. Learning about the topic which is then explained to others helps the subjects remember the topic. It also helps his subjects get better scores in classes. The findings support the claim that teaching, as experienced throughout periods of time and across cultures, is the best method of learning as found in the "pyramid of learning" by the National Training Laboratories in America. Students remember less than 40% when they learn, but they remember up to 90% when they teach other people (Duran & Topping, 2017).

This research then intends to answer two research problems which are whether learning by teaching is effective to teach tenses and how effective learning by teaching is to teach tenses to junior high school students. The reason to choose those research problems is that Ahmed's qualitative research focuses on his subjects' reflections on their motivation and linguistic competence. Nevertheless, the pieces of research about learning by teaching, especially focusing on English language skills such as grammar, are still limited (Duran & Topping, 2017), especially in the Indonesian context. Therefore, the objective of this research is to investigate whether learning by teaching is effective for students to learn English language skills, in which this case study focuses on English language tenses in an Indonesian context where most students are still passive learners (Lestari & Widjajakusumah, 2009). This research will be beneficial for the teachers to consider in implementing learning by teaching instead of presentations as it is a good way to learn, and for students is to comprehend materials deeper and better.

METHODS

This research is conducted in a junior high school in Jakarta. Two of the eighth grade classes (second year of junior high school) with 50 students in total are chosen as subjects for this research, one as a control group and one as an experimental group with 25 students in each group. These two classes are chosen based on their similar score distributions. Both groups are taught by the same English teacher to ensure the reliability of this research. The control group is taught just like in normal teaching-learning interactions, while the experimental group is assigned to conduct learning by teaching as their treatment in which students in small groups will later prepare for their teaching and then teach their peers. The instrument for this research is a grammar test that is focusing on English language tenses. This grammar test is given to see if learning by teaching is effective for students in learning grammar. Tenses are

chosen as the material because tenses are normally taught in all school levels in Indonesia, including at the junior high school level, and it is considered difficult material for Indonesian students.

Five tenses are covered in the grammar test, including the simple present tense, the simple past tense, the simple future tense, the simple present continuous tense, and the simple present perfect tense. There are 50 questions with 10 questions for each tense. The test item type is filling in the blanks with the verbs given in parentheses. The questions are made by the researcher and the English language teacher and are later validated by two other English teachers that are teaching at the same level. After being validated, the test is piloted to 10 students from other classes. Later, the test is used as a pre-test and two post-tests.

The pre-test is given to both groups at the beginning of the research. After having the results or scores for both groups, the control group is taught all the five tenses for the next three weeks by the teacher, and most of the teacher-centered learning takes place in the class setting. On the other hand, the experimental group is given the treatment for three weeks before the post-test is administered.

The 25 subjects in the experimental group are asked to form a group of two or three subjects. In the first week, all the groups are asked to do research on the five tenses. They also have to prepare their teaching materials and decide on their teaching methods. In the second week, all the groups consult their teaching materials and methods with their teacher. After their teacher has given some feedback to all groups, they get three days to revise their teaching materials and methods. During those three days, they are allowed to consult their progress or problems with their teacher. After the three days, they have to do their teaching demos in front of their classmates and their teacher who will give them some feedback. In the third week, all the groups are assigned to teach the simple present tense, the simple past tense, and the simple future tense to students in the first grade. They also have to teach the simple present continuous tense and the simple present perfect tense to the other second grade classes. To emphasize the application of learning by teaching, the groups do not only inform or present the materials, but they also conduct some class activities, including some exercise and evaluation, to maximize the understanding of their peers who are taught about the tenses.

A week after their teaching, both the control group and the experimental group are given the first post-test without prior notice. During that whole week, the teacher does not review any material about tenses. The second post-test is administered three months after the first post-test. Similar to the first post-test, within the three months, the teacher has never discussed any of the five tenses explicitly to both groups. The use of two post-tests in two different periods is intended to see how effective learning by teaching is and how much of the material the subjects can retain after a period of time.

RESULTS AND DISCUSSIONS

The findings presented are the results of the pre-test and the post-test. The pre-test is a 50 question grammar test about tenses with 10 questions for each tense. All the tenses have not yet been explained by the teacher prior to the pre-test, but they will be explained later after the pre-test. The pre-test is conducted in 40 minutes. The results of the pre-

test in both groups; the control and the experimental groups are summarized in Figure 1. It shows that students from both groups share a similar understanding about tenses which can be seen from their pre-test scores. From the control group, two subjects get very high scores in the range of 80 to 100. Two other subjects score in the range of 60 to 79, while seven subjects score in the range of 41 to 59. Most of the subjects, 14, score 40 or below. A similar score distribution can be seen for the experimental group. Only one subject gets 80 or above, and three subjects score between 60 and 79. Five subjects score in the range of 41 to 59. The majority of the subjects, 16, score 40 or below.

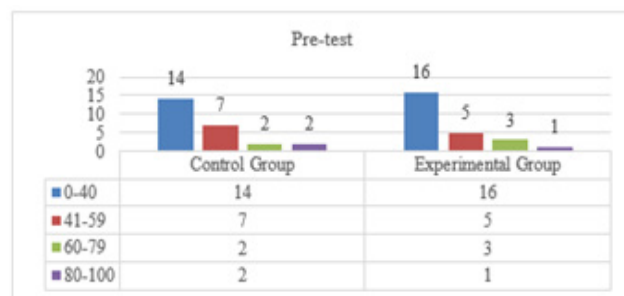


Figure 1 The Results of the Pre-test

After the pre-test, the experimental group is given the learning by teaching treatment, while the control group is taught about the five tenses by the teacher in the class. This process lasts for three weeks. In the fourth week, an unannounced post-test is given to see if the learning by teaching has a better impact on the subjects' comprehension of tenses. The post-test is the same as the pre-test. The subjects are given the same questions which have to be done in 40 minutes.

The first post-test results of both the control and the experimental groups are summarized in Figure 2. This first post-test is conducted without notice a week after the treatment is given. Nine subjects from the control group score 40 or below. Most of the subjects, 12, score in the range of 41 to 59. Moreover, two subjects score between 60 and 79, and two subjects score 80 or above. On the other hand, none of the subjects from the experimental group score 40 or below. Two subjects score in the range of 41 to 59. The majority, 18 subjects, score in the range of 60 to 79. Lastly, five subjects receive scores of 80 or above.

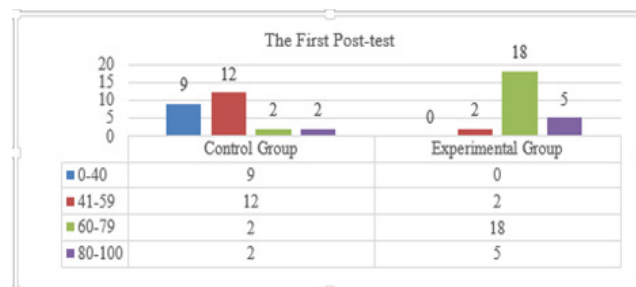


Figure 2 The Results of the First Post-test

The second post-test results of both groups are summarized in Figure 3. This second post-test is conducted three months after the first post-test. Like the first post-test, the second post-test is also conducted without prior notice

to the subjects. Figure 3 shows that 13 subjects from the control group score 40 or below. Twelve subjects score in the range of 41 to 59. However, none of the subjects score above 60. In contrast, none of the subjects in the experimental group score below 40, and only one subject receives a score between 41 and 59. Most of the subjects, 17, score in the range of 60 to 79. The rest of the subjects, seven of them, score above 80.

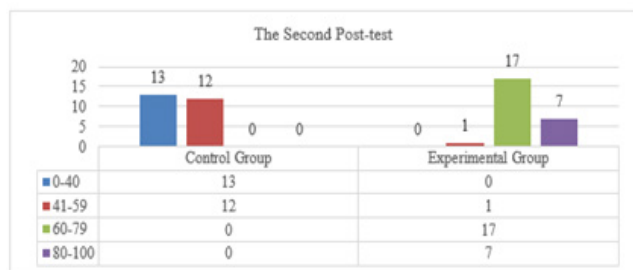


Figure 3 The Results of the Second Post-test

Although both groups show some improvements, but the more significant improvements are experienced by the experimental group. The treatment of assigning the subjects to teach tenses to other students helps decrease the number of subjects scoring 40 or below from 16 subjects to none. A slight decrease is also experienced in the number of subjects receiving scores in the range of 41 to 59 from five to two subjects. The number of subjects scoring between 60 and 79 shows a significant increase from only three subjects to 18 subjects. It shows a 60% increase in total improvement. There is also a surprising increase in the number of subjects scoring 80 or above from one subject to five subjects.

Even though the control group also shows some improvements, the most significant increase happens in the group of subjects scoring in the range of 41 to 59 from seven subjects to 12 subjects that are representing a 20% increase in total improvement. A very slight decrease can be found in the group of subjects scoring 40 or below from 14 subjects to nine subjects. However, there are no changes in the number of subjects getting scores in the range of 60 to 100.

Another interesting point to discuss is how long the subjects will remember the materials without having been taught the materials again. The results clearly show that the subjects in the control group do not remember the materials well after three months. Their scores even drop from the first post-test. The number of subjects scoring below 40 increased from nine to 13. However, the number of subjects obtaining above 60 decreases from four subjects to none. On the other hand, the subjects in the experimental group clearly demonstrate that they can still remember the materials they teach. While the number of subjects scoring in the range of 41 to 59 decrease from two to one and those in the range of 60 to 79 decreased by one point from 18 to 17, the number of subjects scoring above 80 increase from five to seven subjects.

Based on the scores, the fact that three weeks of learning the tenses in two different ways, learning by teaching and the usual classroom learning for two different groups and one week without any discussions related to the five tenses shows that learning by teaching helps subjects understand the materials better. In addition, having been tested three months after the first post-test, the subjects in the experimental group obviously retain the materials or topics they teach to other students or other people longer, which is

similar to the findings of Ahmed (2013). The subjects who taught can score higher than those who learn the materials in the class due to their brain memory. This also supports the claim that students remember 90% of the materials they teach to others (Duran & Topping, 2017).

The subjects can also score higher as they understand better. The subjects' direct involvement in researching for the materials in discussing with their peers and teacher, and also in teaching the materials with their own chosen methods, helps the subjects' comprehension of the subject matter. Through teaching, the subjects understand the materials more thoroughly as also mentioned by Ahmed (2013). The subjects' better comprehension of the materials is also the result of their being given a chance to discuss the materials, as also stated by Kember (as cited in Faridi, Bahri, & Nurmasitah, 2016). However, this research is conducted with some limitations too. The first one is the small number of subjects which cannot be used to generalize the findings. The second limitation is related to the time to conduct the research. Conducting the research in three weeks can result in the process being done in a rush. A longer timeframe can most likely affect the reliability of the results.

CONCLUSIONS

With the introduction of the 2013 curriculum, education in Indonesia has seen a new era. Teacher-centered learning, which used to be dominant, has been supplanted by student-centered learning. The new curriculum has encouraged all teachers to apply student-centered activities in classrooms across Indonesia. However, without enough knowledge of student-centered activities or not enough willingness to apply the student-centered learning approach, many teachers commonly assign their students to do some presentations as a part of their student-centered activities, while teachers in Indonesia are still looking for the right activities to implement student-centered learning. This research aims to show that LBT can be one beneficial activity to apply. It has been proven to be a helpful student-centered learning activity as it encourages students to interact with their friends actively; to actively prepare materials, to remember materials longer, and to contribute to teaching methods.

The first post-test conducted a week after the treatment shows some significant improvements in the experimental group compared to the control group which only experiences slight improvements. The second post-test is conducted three months after the first post-test, and it also shows that the subjects in the experimental group can still remember the materials and score well on the post-test. The opposite happens to the subjects in the control group which experiences lower and worse scores, even when the scores are compared to their first post-test. These two results show that LBT is an effective way to learn English or tenses in this particular case, and it is also a good activity for student-centered learning. The second post-test also shows that subjects retain their materials longer. LBT is not only useful to improve their motivation and confidence through their interactions with their friends, as presented in the previous research by Ahmed (2013), but it is also useful to improve subjects' comprehension of English language tenses. In addition, it also helps the subjects remember the materials longer.

This research is conducted with some limitations. The first one comes from the subjects. The unfamiliarity

of active students hinders them to be creative in their teaching process. The second limitation comes from the teacher who has a strong urge to get involved in some of the processes. However, the findings of this research can be seen as evidence to apply LBT in schools. In addition, future research will be done with more subjects and more time as well as a wider scope to improve and strengthen the position of LBT in English language learning.

REFERENCES

- Ahmed, A. G. A. (2013). The impact of learning by teaching strategy on university students' linguistic competence. *University of Bakht Alruda Scientific Journal*, 9, 185-200.
- Ahmed, A. K. (2013). Teacher-centered versus learner-centered teaching style. *The Journal of Global Business Management*, 9(1), 22-34.
- Aslan, S. (2015). Is learning by teaching effective in gaining 21st century skills? The views of pre-service science teachers. *Educational Sciences: Theory & Practice*, 15(6), 1441-1457. doi:10.12738/estp.2016.1.0019.
- Aslan, S. (2017). Learning by teaching: Can it be utilized to develop inquiry Skills? *Journal of Education and Training Studies*, 5(12), 190-198. doi:10.11114/jets.v5i12.2781.
- Asoodeh, M. H., Asoodeh, M. B., & Zarepour, M. (2012). The impact of student-centered learning on academic achievement and social skills. *Procedia - Social and Behavioral Sciences*, 46, 560-564. doi:10.1016/j.sbspro.2012.05.160.
- Biswas, G., Leelawong, K., Schwartz, D., Vye, N., & The Teachable Agents Group at Vande. (2005). Learning by teaching: A new agent paradigm for educational software. *Applied Artificial Intelligence: An International Journal*, 19(3-4), 363-392. doi:10.1080/08839510590910200.
- Cherney, I. D. (2011). Active learning. In R. L. Miller, E. Amsel, B. M. Kowalewski, B. C. Beins, K. D. Keith, & B. F. Peden (Eds.), *Promoting Student Engagement; Volume I: Programs, Techniques and Opportunities* (pp. 150-156). Washington DC: Society for the Teaching of Psychology.
- Duran, D. (2017). Learning-by-teaching: Evidence and implications as a pedagogical mechanism. *Innovations in Education and Teaching International*, 54(5), 476-484. doi:10.1080/14703297.2016.1156011.
- Duran, D., & Topping, K. (2017). *Learning by teaching: Evidence-based strategies to enhance learning in the classroom*. London: Routledge.
- Exley, B. (2005). Learner characteristics of 'Asian' EFL students: Exceptions to the 'Norm'. In J. Young (Ed.), *Proceedings Pleasure Passion Provocation Joint National Conference AATE & ALEA 2005* (pp. 1-16). Gold Coast, Australia.
- Faridi, A., Bahri, S., & Nurmasitah, S. (2016). The problems of applying student centered syllabus of English in vocational high schools in Kendal regency. *English Language Teaching*, 9(8), 231-240. doi:10.5539/elt.v9n8p231.
- Fiorella, L., & Mayer, R. E. (2013). The relative benefits of learning by teaching and teaching expectancy. *Contemporary Educational Psychology*, 38(4), 281-288. doi:10.1016/j.cedpsych.2013.06.001.
- Fiorella, L., & Mayer, R. E. (2014). Role of expectations and explanations in learning by teaching. *Contemporary Educational Psychology*, 39(2), 75-85. doi:10.1016/j.cedpsych.2014.01.001.
- Garrett, T. (2008). Student-centered and teacher-centered classroom management: A case study of three elementary teachers. *Journal of Classroom Interaction*, 43(1), 34-47.
- Grzega, J. (2006). Developing more than just linguistic competence—The model LdL for teaching foreign languages (with a note on basic global English). *Humanising Language Teaching*, 8(5), 1-7. Retrieved from <http://www.joachim-grzega.de/ldl+bge.pdf>.
- Gutman, M. (2017). Immediate and long-term effects of "learning by teaching" on knowledge of cognition. *Journal of Education and Learning*, 6(4), 1-11. doi:10.5539/jel.v6n4p1.
- Königs, F. G. (2003). Teaching and learning foreign languages in Germany: A personal overview of developments in research. *Language Teaching*, 36(4), 235-251. doi:10.1017/S0261444804001995.
- Lenat, D. B., & Durlach, P. J. (2014). Reinforcing Math knowledge by immersing students in a simulated learning-by-teaching experience. *International Journal of Artificial Intelligence in Education*, 24(3), 216-250. doi:10.1007/s40593-014-0016-x.
- Lestari, E., & Widjajakusumah, D. (2009). Students' self-directed learning readiness, perception toward student-centered learning and predisposition towards student-centered behaviour. *South East Asian Journal of Medical Education*, 3(1), 52-56.
- Retnawati, H., Hadi, S., & Nugraha, A. C. (2016). Vocational high school teachers' difficulties in implementing the assessment in curriculum 2013 in Yogyakarta Province of Indonesia. *International Journal of Instruction*, 9(1), 33-48. doi:10.12973/iji.2016.914a.
- Roscoe, R. D. (2014). Self-monitoring and knowledge-building in learning by teaching. *Instructional Science*, 42(3), 327-351. doi:10.1007/s11251-013-9283-4.
- Tahir, I. (2017). English pedagogy through holistic approach for EFL students' engagement in Indonesia. *PEOPLE: International Journal of Social Sciences*, 3(1), 273-287. doi:10.20319/pijss.2017.31.273287.
- Wangid, M. N. (2014). Student-centered learning: Self-regulated learning. In *International Conference on Fundamentals and Implementation of Education (ICFIE) 2014* (pp. 161-165). Yogyakarta: Yogyakarta State University.