Students’ Perception of Using “Plickers” Application to Assess Students’ Tenses

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ABSTRACT
This research was conducted to investigate the students’ perception of using the “Plickers” application to assess students’ tenses. In order to obtain the data, the research employed a descriptive qualitative research design. The participants were 35 students from class X IPA IC SMAN 2 Kendari. This research used questionnaires and interviews as data collection methods. In the questionnaire, the researcher applied a close-ended questionnaire with a Likert scale containing three aspects with nine specific questions and analyzed using SPSS 16. While, the interview was used to obtain a deeper analysis of students’ perception of the Plickers app, which was given after the post-test and questionnaire. The results presented in the form of graphs and percentages showed that the positive perceptions were higher than negative and neutral perception results. The result of the learning aspect was 89.3 % positive and 10.70% neutral, and the result of the behavior aspect was 91.5% positive and 8.5% neutral. Furthermore, the result of the general use aspect was 87.1% positive and 12.9% neutral. Subsequently, the interview data were analyzed by Miles and Huberman's view of data analysis consisting of data reduction, data display, and drawing a conclusion. The results of the interview analysis showed a positive result, which implied the positive perception of students in using Plickers to assess tenses. Therefore, “Plickers” application contributed to the student's understanding of the material and impacted their tenses scores.

Keywords:
Plickers application, assessment, tenses.

1. Introduction

Technologies such as computers, laptops, tablets, and Smartphones make it easier for human beings of today to exchange information, make faster decisions, interact socially, get entertainment, process financial transactions efficiently, buy online, and manage homes. Undoubtedly, technology plays an important role in every aspect of life, and no exception to education. As stated by Basal (2015), technology has become an integral part of the educational setting. Teachers should adapt the technologies that have already been provided to their teaching to create better learning opportunities for the students. By providing technology, teachers will be able to provide a rich learning experience to the students and either create a more engaging or motivating classroom. As mentioned by Trimmel & Bachmann (2004), the number of students who utilize technology as their learning tool is increasing every single day and interest in learning as well as performing higher motivation (Femylia et al., 2022). Thus, implementing technologies in every sphere of the learning process is highly recommended to teachers to make effective learning.
Nevertheless, the implementation of technology is not solely limited to learning methods. Safitri et al. (2023) point out that many students are interested in using technology. This is because technology has penetrated the assessment process as well. Generally speaking, two types of assessment can be used by teachers to evaluate the student’s performance, they are formative and summative assessments, and they both are important. Conversely, summative assessment is taking the role at the end of the learning period and helps teachers produce grades and make judgments about the whole learning process (Boston, 2002). Teachers must consider the role of formative assessment plays in the learning process or to be precise when the learning process is taking place since it provides the information needed to adjust teaching and learning (Boston, 2002). Furthermore, Elmahdi et al. (2018) point out that formative assessment can improve students’ performance by giving them immediate feedback. In this sense, formative assessment tells both teachers and students regarding understanding at a point when timely adjustments can be made. Indeed, formative assessment is a part of the learning process that teachers should be aware of. One of the assessment technologies that can help the formative assessment process is Plickers. It is a Classroom Response System (CRS) application which is one of the technologies specifically designed as a formative assessment tool that can be used in the classroom. It collects real-time formative assessment data, which can then be used by teachers to restructure or tailor their lessons.

The majority of Indonesian teachers in school are still using the conventional method for assessment. As the researcher managed an interview with the English teacher, the same thing happened to SMAN 2 Kendari who still utilizes what so-called conventional technique. The teacher said that to assess student understanding of the ongoing lesson, she simply gives them a direct question that is related to the material and waits for their response. Despite that fact, the teacher acknowledges that the typical technique of assessment is ineffective. It can be seen by the lack of student participation in the assessment process. The students manifest a careless attitude when answering the questions and they tend to be passive when the assessment process is being given. Nonetheless, this condition is even more exacerbated by the low implementation of formative assessment by the teacher in the classroom (Black & Wiliam, 1998).

Several grounds why the formative assessment process in English class SMAN 2 Kendari is feeble. The big number of students and lack of time make the teacher overwhelmed in managing the class to give a proper formative assessment. Approximately, the conventional technique of assessment used by the teacher can merely cover one to five students out of thirty-five students, it is surely caused by the limited time of learning. This circumstance breaks the formative assessment’s goals and limits the student to self-assess their understanding of the lesson (Boston, 2002). Furthermore, the teacher confirmed that high student engagement in the formative assessment happens when it is presented by combining it with an interesting method or games. But, preparing such a method is difficult for the teacher since it takes time to prepare, not to mention when executing it. Additionally, limited access to resources such as clickers also makes it hard for the teacher to implement a proper technology-based system such as SRS to help the assessment process in learning.
Therefore, the researcher chose the Plickers application as an assessment tool to do the formative assessment for online learning to bring simplicity and opportunity to both students and teachers to experience a new way of doing formative assessment in an online classroom which eventually can enhance learning. As stated by Jinu & Beegum (2019), Plickers is a simple and fun application that provides quick feedback, a very user-friendly app, and suitable for all ages. The learning process often time neglected the importance of applying technology in its application which ended up reducing the result of learning for students also one factor that encouraged the researcher to do research in this field. Numerous research showed that the app brought great efficiency to increase students learning also one of the reasons why the researcher is interested to take this app. Taking everything into consideration, the researcher decided to take those particular reasonings to conduct a research that will delineate students’ perception of using Plickers application for learning tenses.

2. Methods

This research used a descriptive qualitative design. Lambert & Lambert (2012) stated that descriptive qualitative design is a comprehensive summarization of a specific event experienced by individuals or group of individuals. The participants were 35 students from class X IPA IC SMAN 2 Kendari. This research used questionnaires and interviews as data collection methods. In the questionnaire, the researcher applied a close-ended questionnaire developed by Bachman (2017) with a Likert scale containing three aspects with nine specific questions and analyzed using SPSS 16. While, the interview was used to obtain a deeper analysis of students’ perception of the Plickers app, which was given after the post-test and questionnaire. In analyzing the close-ended questionnaire data, the researcher used SPSS 16 version, while the interviews were analyzed with three steps, namely data reduction, display data and conclusion drawing/verification.

3. Result

Based on the results of closed-ended questionnaire, the researcher has investigated the students’ perception of using Plickers as a formative assessment tool by giving them questionnaires with 9 questions adopted from Bachman (2017). The results can be seen in the following table.

<table>
<thead>
<tr>
<th>Items</th>
<th>SD</th>
<th>A</th>
<th>N</th>
<th>D</th>
<th>SD</th>
<th>Std</th>
<th>Mean</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>12</td>
<td>21</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.57</td>
<td>4.29</td>
</tr>
<tr>
<td>Q2</td>
<td>13</td>
<td>15</td>
<td>7</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.74</td>
<td>4.17</td>
</tr>
<tr>
<td>Q3</td>
<td>13</td>
<td>18</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.65</td>
<td>4.26</td>
</tr>
<tr>
<td>Q4</td>
<td>21</td>
<td>12</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.61</td>
<td>4.54</td>
</tr>
<tr>
<td>Total</td>
<td>125</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>140</td>
</tr>
<tr>
<td>%</td>
<td>89.3%</td>
<td>10.70%</td>
<td></td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table above shows the frequency of the items that cover the learning aspect in the questionnaire which consist of 4 questions, the data displayed with frequency (F) and the percentage of each item. The frequency (F) refers to the total students who chose each item based on the choices which strongly agree (SA),
Agree (A), neutral (N), disagree (D), strongly disagree (SD), then the percentage (%) refers to the percentage of total students who chose each item. In the item 1, 21 (60%) out of 35 students were agreed that using Plickers help them to obtain feedback on their understanding of the material, while 12 (34.2%) students were strongly agree. It indicates Plickers does help the students to obtain feedback on their understanding. In the item 2, 12 (37.1%) students out of 35 were strongly agreed, 16 (42.9%) students agreed and another 7 (20%) stayed neutral. It shows that by comparing a conventional class to a class that implements Plickers, the students can gain more knowledge as well as understanding. In the item 3, 13 (37.1%) out of 35 students were strongly agreed and 19 (51.42%) others were agreed while the other 3 were neutral. It exposes positively that questions given through Plickers have encouraged the students to participate in the learning process. Then, in the item 4, 20 (60%) out of 35 students were strongly agreed and 13 (34.3%) out of 35 were agreed. It proves that Plickers helped them to measure their understanding of the given material.

Table 2. The frequency of students’ response of using plickers based on the student behaviour aspect

<table>
<thead>
<tr>
<th>Items</th>
<th>SD</th>
<th>A</th>
<th>N</th>
<th>D</th>
<th>SD</th>
<th>Std</th>
<th>Mean</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>Q5</td>
<td>10</td>
<td>28.6%</td>
<td>22</td>
<td>62.9%</td>
<td>3</td>
<td>8.6%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Q6</td>
<td>15</td>
<td>42.6%</td>
<td>18</td>
<td>51.4%</td>
<td>2</td>
<td>5.7%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Q7</td>
<td>15</td>
<td>42.9%</td>
<td>16</td>
<td>45.7%</td>
<td>4</td>
<td>11%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>91.5%</td>
<td>9</td>
<td>8.5%</td>
<td></td>
<td></td>
<td></td>
<td>105</td>
</tr>
</tbody>
</table>

The table above shows the frequency of the items that cover the student behaviour aspect in the questionnaire which consist of 3 questions, the data displayed with frequency (F) and the percentage of each item. The frequency (F) refers to the total students who chose each item based on the choices which strongly agree (SA), Agree (A), neutral (N), disagree (D), strongly disagree (SD), then the percentage (%) refers to the percentage of total students who chose each item. In the item 5, 21 (62.9%) others were agreed that “I chose my answers to Plickers questions carefully“. This confirms that the students do not either choose their answer randomly or carelessly but they think carefully before giving responses. In the item 6, 13 (42.6%) respondents were strongly agreed and 19 (51.4%) respondents out of 35 agreed that “I paid attention to whether or not my answers to a Plickers question were right or wrong.”. It shows that the students were paying attention when the questions were given to them and tried to answer the question correctly. Then, in the item 7, 17 (45.7%) students out of 35 strongly agreed, 13 (42.9) students were agreed. It means that the respondents were digging for a reason if they got a wrong answer in Plickers.

Table 3. The frequency of students’ response of using plickers based on the general use aspect

<table>
<thead>
<tr>
<th>Items</th>
<th>SD</th>
<th>A</th>
<th>N</th>
<th>D</th>
<th>SD</th>
<th>Std</th>
<th>Mean</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>Q8</td>
<td>21</td>
<td>60%</td>
<td>11</td>
<td>31.4%</td>
<td>3</td>
<td>9%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Q9</td>
<td>16</td>
<td>45.7%</td>
<td>13</td>
<td>37.1%</td>
<td>6</td>
<td>17%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>61</td>
<td>87.1%</td>
<td>9</td>
<td>12.9%</td>
<td></td>
<td></td>
<td></td>
<td>70</td>
</tr>
</tbody>
</table>

162
The table above shows the frequency of the items that cover the general use aspect in the questionnaire which consist of two questions, the data displayed with frequency (F) and the percentage of each item. The frequency (F) refers to the total students who chose each item based on the choices which strongly agree (SA), Agree (A), neutral (N), disagree (D), strongly disagree (SD), then the percentage (%) refers to the percentage of total students who chose each item. In the item 8, 21 (60%) respondents out of 35 were strongly agreed and 12 (31.4%) were agreed that Plickers is easy to use. It shows beyond doubt that Plickers app has simple features that bring ease to its users to use without any confusions. Then, in the item 9, 15 (45.7%) respondents out of 35 were strongly agreed, 11 (37.1%) were agreed and 9 were neutral that “Plickers should be used in other classes on school”. It demonstrates that the students highly recommend Plickers app to be used not in their class but also another class in SMAN 2 Kendari.

Moreover, based on the results of interview, the opinions of students about Plickers assistance on their understanding toward the lesson were grouped under four codes. It is seen that students agreed that using Plickers in online class has changed the learning environment. They felt Plickers helping them to understand the lesson better. The students agreed that Plickers is useful and it is able to give instant feedback. They found it motivated them to be more active in the classroom since it was enjoyable and not limiting them to express their level of understanding. This is in line with Gurisik & Demirkan (2019) found that 90% of high school students said the class with the Plickers was more fun and enjoyable. Masita & Fitri (2020) also concluded that varied teaching methods make students comfortable, particularly when learning is presented as interested as playing games. All of the participants also preferred to use Plickers instead of paper tests. One of the students stated that:

“It helps me a lot, because different from Plickers when I used GCR or Google Form, it’s kind of difficult and I did not obtain any feedback afterwards because the teacher did not have enough time to do so”.

Then, the respondents’ response about the strength and weakness of Plickers are grouped under four codes. They found Plickers application is beneficial since it is very simple and easy to use. There was not a single respondent who expressed that they still need to learn to use Plickers in the classroom as they found it difficult to use it in the classroom due to their low knowledge of using technology. Furthermore, the students obtain more interested to use the app because the app’s processing is light and not burdening their phone memory, which already crowded with other applications.

“It is so convenient and simple to use compared to google form or GCR that we used to use”.

Nevertheless, the students felt that low connectivity which caused them to obtain lag still caused a little trouble. Rather, they felt most of the time, low connectivity has not been a problem for them. In addition to that, the students felt that the implementation of Plickers can be used both online and offline during the teaching and it does not need a complicated way of using it. This makes the students able to use this application even though they do not have a high
specification of mobile phones since the standard ones would work properly and all systems are supported (e.g Samsung, Oppo, Redmi, Apple).

“Sometimes it is a little bit laggy. However, that’s not a big problem”.

Move to their opinion under the theme of comparing Plickers to the conventional method such as raising hands and being asked a direct question that is grouped under three codes, the students felt that Plickers is way more effective in engaging them to express their understanding of the material. The issues they had in the conventional class such as, not having enough time to ask about the material, feeling diffident to ask, ashamed of the inaccurate answer seemed to not appear in the classroom with Plickers. This statement is in line with Gurisik & Demirkan (2019); 78% of high school students preferred to use Plickers instead of the conventional method. Sasmiko et al. (2019) explained Plickers have proven to be more effective than traditional methods of improving reading comprehension and student motivation. One of the students stated that:

“It won’t be the same because I have felt that almost every day in a conventional class. I tend to be afraid to ask the teacher because I am afraid my answer is inaccurate and the teacher tends to give more attention to the ones who already understand the material than the ones who don’t”.

As for the last opinions that are grouped under three codes the students felt that the increasing score that they gain in their tests are caused by the implementation of Plickers in the classroom. Acquiring fast feedback and regularly answered the questions on Plickers that related to the material boosted their understanding and knowledge which initially increase their test scores. Moreover, attaining more time to do practice and learning in the classroom make them having more time to learn and understand the lesson as one of the participants state that:

Yes, I practice a lot with Plickers I think that is the reason why I could do better in the tests.

This is in line with Masita & Fitri (2020) who revealed that using Plickers as a formative assessment tool can increase students’ vocabulary mastery. Moreover, Michael et al. (2019) had also interviewed about the use of Plickers for language assessment all of the respondents agreed that the use of Plickers in assessing reading comprehension shows a positive impact.

4. Discussion

After investigating the students’ perception of using the Plickers app as a formative assessment tool for assessing students' tenses at grade X of SMAN 2 Kendari, the results of this study are obtained. As for the learning aspect, 89.3% of the total respondent shows positive perception in other words the students had a good learning experience with the presence of the Plickers app in the classroom as the formative assessment tool. Also, 10.7% responded neutrally. Regarding the aspect of student behavior, 91.5 % of students responded positively and 8.5 % of them were neutral. It is undoubtedly shown that the students have a positive attitude toward Plickers. In other words, the students used the app in earnest, paid attention to the questions given in Plickers, chose their answers carefully, and asked or looked for
further explanation if the answers they had given were inaccurate. For the last aspect which is the general use aspect, as shown on the graph, 87.1 % responded positively and 12.9 % were neutral. It demonstrates that the student has a good time when using the Plickers app. They don't find any difficulties processing the app, it was easy for them. Furthermore, they highly recommended Plickers app be used not only in their class or English subject but also to be used in another class in their school.

Initially, the researcher did four times Plickers implementation in class. This aims to make the pupils grasp more of the app. The researcher did an initial introduction about the aim, function, feature, how to use and how does Plickers application work to reduce the possibility of misconceptions and misuse of the app. Furthermore, the researcher encouraged the students to ask about the app if there was still something not understandable. At the initial meeting, the researcher gave a pre-test to measure students’ mastery of tenses.

However, Plickers application enhances the students learning. Based on the results, Plickers application is a student response system (SRS) that can aid students to get a better learning experience. This statement is based on the result which 35 students in the 1st year participated in the research, 94.2 % of participants indicated that learning with Plickers in the classroom has enhanced their learning through feedback given by Plickers. The interview result has provided a wider explanation of this item in which the students felt that fast feedback given by Plickers helped them to learn better and be aware of their previous mistakes. Furthermore, Eighty-seven percent (80%) of the students stated that Plickers gave them a better understanding of tenses material than conventional class provides, they agreed that Plickers allows them to understand the learning easier which can barely be acquired with the traditional method of assessment. This result is also in line with Elmahdi et al. (2018) that assessments that used conventional methods incriminated the assessment process. This statement is also strengthened by the interview result where all of the respondents positively argued that class with Plickers is creating a better learning environment and motivated them which resulted in them having a better understanding of the lesson compared to the standard conventional class (without Plickers). Meanwhile, 92.3% of the students said that Plickers kept them more engaged in the classroom and helped them to review the topic effectively. Meanwhile, 94.2% of the students stated it helped them to gauge their knowledge. The vast majority of the students indicated that Plickers improved their exam grades. They believed that Plickers exercise helped them with better exam preparation by focusing and understanding the topic given. Therefore, by using this app, students can learn from their mistakes and obtain the motivation to be more active in the learning process and challenge them to give their best in the subject of the simple past tense and present perfect tense. This result is in line with Masita & Fitri (2020) who revealed that applying Plickers in learning for formative assessment in class can uplift student motivation and focus in the class.

Then, students’ behavior reflected by their positive attitude toward the learning process in class is one of the most important factors that will influence students’ achievement. It is not expected behavior and may jeopardize the general active learning environment. Nevertheless, the researcher must highlight that this is not a particular issue of Plickers, but all teaching methods. Liu et al. (2012) stated that
most teachers acknowledge that it is always difficult to keep students’ good attitudes such as motivation on learning, engagement, and concentration during learning time. Lack of motivation can cause a reduction in learning outcomes and a negative atmosphere in the classroom. Nevertheless, the result of the questionnaire item in this research showed that the student’s behavior towards Plickers is highly positive. In which, they did not choose the answer recklessly, they paid attention to every assessment process and did confirmation if they got any inaccurate answers.

Despite that, based on interview results, Plickers indeed has the potential to make students interested in learning by making them participate and also produce a sense of fairness because every student, either shy or spontaneous, has the opportunity to give their opinions and answers by promoting polling activities. This result is parallel with Elmahdi et al. (2018) who revealed that using Plickers app can increase student engagement, save time and provides equal opportunity for participation, and also can create a positive atmosphere in the classroom. Furthermore, this result is also in line with several studies that have shown Plickers in line with other technology-based online learning tools is very effective in increasing students' behavior toward learning (Borst, 2017) and significantly enhances their learning through better engagement in the classroom (Masita & Fitri, 2020). By utilizing Plickers, the issues stated earlier in this research such as not having enough time because the assessment process taking so much time, and big number of students that are unable teacher to do learning and do the formative assessment process properly are possible with Plickers.

Lastly, Plickers is fun and easy to use. The participants agreed that Plickers has a simple feature that did not confuse and is easy to use. Although it was the first time for the students to utilize Plickers in their learning, they perceived a fast understanding of the use of it. Furthermore, Although Plickers is processed along with an online classroom platform, It still runs smoothly and an issue such as bug and crash does not appear. Furthermore, the students felt that Plickers is an enjoyable application that provides them with a different type of answering questions in class and the students who are satisfied with Plickers' assistant want Plickers to be utilized in another subject, not just in English. As stated by one of the participants: Plickers really does appear as a fun application that triggers excitement in the students. This feeling of excitement has none other basis than Plickers interface and performance in the classroom that change the conventional method of assessment with a technology-based assessment that eventually, aids the learning process.

Technically, there are several advantages of using Plickers in formative assessment. Plickers application facilitates the teacher to prepare the assessment. This application is not time-consuming. It is easy to use. The students were focused and relaxed with this activity. The use of Plickers in formative assessment showed positive responses from both teachers and students. This study also found some disadvantages of using Plickers. This application was using an internet connection, smartphone, laptop, and projector. If the teacher wants to utilize it offline, they have to prepare by installing the application into their smartphone. In the exam, an internet connection is needed to operate the application using a smartphone, laptop, and projector at the same time. So, this application can be utilized if all devices are completed. This application also was not free. This application is limited only to five questions if the
teacher wants to utilize it freely. To maximize the application, the teacher needs to upgrade it by paying $8.99/month or $5.99/year. The students do not need to download an app, sign up, or verifying identity to obtain logged in to the system.

As for the disadvantages, based on the data, there are some obstacles encountered when using Plickers in formative assessment. For the first time using Plickers in the classroom, all of the participants were not familiar with this application. To solve this problem, they are given an explanation and examples, then carried out simulations. After that, they were enthusiastic about using it. Furthermore, some students argued that the app’s performance depends on the internet connection. Nevertheless, circumventing laggy is near impossible for this app since it depends on the internet provider. Lastly, since Plicekers e-learning works side-by-side with online classroom providers, the teacher needs to have good connectivity to the internet and provide CPU and RAM capacity to reduce lag and crashes. Though, it does not necessarily mean that Plickers can only be processed under a high-spec computer, laptop, or mobile phone. But, closing unnecessary ongoing apps will help run the app smoothly.

5. Conclusion

This research concludes that students have manifested a positive perception of using Plickers for assessing tenses. This conclusion is drawn from the instrument parameters. Firstly, the result of the questionnaires has brought up conclusive evidence where nine out of nine questionnaire items employed in this research have resulted inarguably positive. It is an implication that (1) Plickers has impacted students’ learning, (2) students have a positive attitude toward Plickers. Conversely, Plickers develops a positive environment that encourages the students to give a positive attitude, (3) Plickers is a user-friendly app. Moreover, students’ positive opinions conveyed through interviews have given more validation to the result. In line with the interview result, the students confirm that Plickers has helped them to grasp the learning material better. The students also conveyed that they find more good than harm in using Plickers in learning.

Furthermore, the students also expressed that they immensely prefer to use Plickers than the traditional method that they have been using in school. Also, they confirm that Plickers has given a contribution to their understanding of the material which impacts their test score. Nevertheless, the result also outlines that the students found some disadvantages regarding Plickers. As a case in point about the internet connectivity lag. However, the advantages of using Plickers for learning tenses outweigh the disadvantages. However, Students’ prior knowledge could have affected the result of this research. Students who already had prior knowledge regarding simple past and present perfect tense which lead them to have an advanced understanding among others and they could have done better in the assessment process regardless of the implementation of Plickers given which initially reflected their scores. However, despite how much the researcher been aware of the possibility of this intervening factor, the research should be done with all of the subjects included regardless of their prior knowledge and without any other exceptions since the subjects stand as a group of class. Not to mention, the researcher has no access neither
to reach nor checking students’ background to decide which student has advanced knowledge and who has not.

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