# Synchronous vs. asynchronous: A comparison of perception and learning outcome of students with different online EFL teaching modes at secondary schools

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ABSTRACT

The pandemic COVID-19 has changed the teaching and learning process into online learning, which led to the emergence of many new learning obstacles. Therefore, it is important for the teacher to find an appropriate method to be implemented, as the teaching method is one of the most important things that can affect the success of the teaching and learning process. This survey study aimed to compare the effectiveness of online teaching modes, i.e., synchronous and asynchronous in EFL teaching and learning context. The samples were taken from 596 students from four secondary schools in Purwokerto Regency, Central Java, Indonesia. Data on student perception were collected via questionnaires, while data on learning outcomes were gathered through document. The data were analyzed using descriptive statistics and Mann-Whitney U Test. Results of the study have shown that asynchronous learning is more beneficial for students. Majority of them thought that the disadvantage of asynchronous learning presented did not bother them significantly. Meanwhile, in the case of learning outcomes, synchronous learning is more effective to obtain higher learning outcomes. The results suggest that it is better to implement both methods, so that they can compensate for each other's weaknesses.

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## 1. Introduction

COVID-19 pandemic which started in the early of 2020 has affected all sectors in the society, including education. The opportunity to learn is diminished by the impacts of the pandemic. To prevent the spread of the virus, teaching and learning activities which have always been done directly at the same place and time, now changed into online learning. Muslimah (2018) defines online learning or e-learning as a learning activity which is done online and requires technologies to access educational curriculum outside the traditional classroom. Therefore, teachers should be able to take advantage of technology in their teaching process, especially to facilitate students accessing learning sources. By being able to make use of technology, online learning could also be an innovation in education (Indrayana and Sadikin, 2020).

Communication in online learning, including in English online learning, can be done through synchronous and asynchronous learning methods. According to Chen et al. (2015), the term 'synchronous learning' refers to a condition where the teacher and students take part at the same time. Through synchronous learning, teachers and students from different locations and even from

different countries could access the same class (Moorhouse et al., 2021). Therefore, synchronous learning can also be defined as a scheduled online teaching and learning process which provides real-time or face-to-face communication (Shahabadi and Uplane, 2015).

Synchronous learning promotes many benefits for its implementation in the classroom. Some of them are giving real time communication (Costa et al., 2021), more interactive environment (Arkorful and Abaidoo, 2015), allowing teachers and students to present a document or demonstrate a program (Dada et al., 2019), and increasing students' motivation (Yamagata and Lynch, 2014 in Perveen, 2016). However, there are some disadvantages of synchronous learning, such as more expensive (Dada et al., 2019) and connection problems (Perveen, 2016).

Meanwhile, Darmawan (2018) defines asynchronous learning as an independent learning where students can interact with each other with the provided materials. Furthermore, Dada et al. (2019) defines asynchronous learning as a self-induced learning method which can happen anytime and anywhere. It promotes more flexible learning where the materials are already available in the Learning Management System (Perveen, 2016) which makes it easier to be accessed (Vidhiasi et al., 2021). By applying asynchronous learning, students will have more time to discuss it with their friends, so that their response will be more constructed, innovative, and creative.

On the other hand, asynchronous learning also limits students' interaction, thus they have to be disciplined to keep themselves active and interactive in the learning activities and they have less opportunity to socialize (Perveen, 2016). Dada et al. (2019) also explains that the teaching and learning materials shared through asynchronous methods are not dynamic and interactive. Based on the research conducted by Prasojo and Srisudarso (2021), if the teaching and learning process only uses asynchronous learning, students are struggling to understand the materials given.

However, due to the sudden changes from offline to online learning, all parties, including teachers, school staff, students, and parents were unprepared with new demands. It makes them panicked and feel burdened which makes the teaching and learning activity got disturbed (Reimers, 2021). It also makes many new learning obstacles faced by teachers and students appear. The main problem faced by both teachers and students is unstable internet connection (Akter et al., 2021). In addition, Fojtík (2018) also states that the main problem of online learning is that most participants have no practical experience with this form of teaching which leads to worse results for distance students. Many students also feel burdened with the overloaded assignments and their motivation to learn is decreasing (Angdhiri, 2020).

Hence, it is important for the teacher to use appropriate methods in their teaching activities. According to Maduwu (2016), no matter how great a method is, it will not make great changes in the results if it does not fit the environment or contexts. In addition, Nasution (2017) states that the high quality of learning outcomes comes from the high quality of the learning process. To create a high quality of learning process, teachers should be able to determine and apply the appropriate teaching method.

In developing learning methods, it is also better to consider students' perceptions about the two methods. According to Kapitza et al. (2019) perception is a diverse way in which people consciously recognize invasive species. Regarding synchronous and asynchronous methods, Kunin et al. (2014) found that what students liked in synchronous learning is its interaction because they can be involved in some positive discussion with larger participants. The research also found that students liked the flexibility in asynchronous methods because they are able to use their own learning strategies which is more comfortable.

To measure the success of a method, it can be seen from students' learning outcomes. Rowe and Johnston (2013) define learning outcomes as the specific skills, capacities, attitudes, and knowledge that a student should have as a result of a particular educational activity. In addition, Mahajan and Sigh (2017) equalize learning outcomes with GPS. It can guide students to the desired results of learning. It can also show and help teachers to find the right path to be followed and make students aware of what they will achieve at the end of the teaching and learning process.

However, it takes a quite long time to develop an appropriate method to support students' needs in the teaching and learning process. Moreover, online learning is considered as a new thing in Indonesia. Therefore, the researcher decided to investigate the effectiveness of the two methods by

comparing students' perception and learning outcomes. By knowing the advantages and disadvantages of the methods, it will help teachers in designing an appropriate method to improve the learning meaningfulness and outcomes.

Several similar studies have been conducted by other researchers. One of them is research conducted by Friska (2021) which found that most students have good perception toward online learning. They think online learning can assist the learning process and they have a good attitude toward it. Mamahit (2021) also found that students have good perception toward blended online learning which also impacts their improvement in learning outcomes.

Related to the comparison of synchronous and asynchronous learning, Farell et al. (2021) found an improvement on the learning outcomes in the synchronous method. It is strengthened by research conducted by Moallem (2015) which found that synchronous and combination of both methods give the highest level of social presence and followed by cognitive and emotional support. Furthermore, Perveen (2016) also found that more students think that synchronous mode is better to be implemented. Meanwhile, in the case of learning outcomes, Narayana (2016) and Berry (2018) found that the asynchronous group outperforms the synchronous one.

In respect to the previous studies, the researcher of this study is interested in conducting research about this issue. The differences with those previous researches are: (1) this research did not include the blended version of both methods; (2) this research also have greater amount of samples because it is taken from four secondary schools; (3) this research used comparative survey study, while the others mostly use experimental study; and (4) this research used Mann-Whitney U Test to analyze the data, while the other ones used T-Test and MANOVA.. The questions of this research can be formulated as:

1. What are students' perceptions towards synchronous and asynchronous learning?

2. Which learning method promotes greater learning outcomes between synchronous and asynchronous?

## 2. Method

### 2.1. Research Design

This research is aimed to find out the effect of synchronous and asynchronous methods on students' perception and learning outcomes. Therefore, the researcher used a comparative survey study. A survey study is aimed to collect information in order to describe an existing phenomenon which involves researches that explain relations, make predictions, compare, and evaluate (Suwartono, 2014). According to Sugiyono in Atqiya (2018), the comparative technique is one of the statistical analysis techniques which can be utilized to test the hypothesis if there are any differences among the variables. Unlike an experimental study, in this research, the researcher will directly obtain the final result without doing the process from the start (Winda, 2021).

### 2.2. Research Samples

The samples of this research were taken from 596 students from four secondary schools in Purwokerto, Central Java, Indonesia. The schools were chosen using purposive and convenience sampling techniques. The criterion was that the teacher either used synchronous or asynchronous methods in the first half of this semester. Meanwhile, convenience sampling was used to recruit the samples from those schools. Furthermore, they are split into two groups, i.e., synchronous and asynchronous groups. The detail for sampling size can be seen in Table 1:

Table 1.   Sample Size

| Groups | Population | Sample | Total |
|---|---|---|---|
| Synchronous | 1188 students | 136 students | 298 students |
| | 1069 students | 162 students | |
| Asynchronous | 1250 students | 130 students | 298 students |
| | 1654 students | 168 students | |
| **Total Sample** | | 596 students | |

## 2.3. Data Collection

The data were collected using online questionnaires to examine students' perception. The questionnaires consisted of two dimensions namely the advantages and disadvantages of synchronous and asynchronous learning. It was administered through Google Form. This research also used documents in the form of mid-term examination score lists to investigate the learning outcomes.

The process of collecting data was started by surveying several secondary schools in Purwokerto Timur. After finding the suitable schools, the researcher does a short interview with the teachers and then collects the documents. To distribute the questionnaire, the researcher gave the link to the teachers. Then, the teachers share it to the students through WhatsApp Group.

## 2.4. Data Analysis

To analyze the data from the questionnaire, the researcher used a descriptive statistics method. According to Suwartono (2014), this procedure uses simple statistics. In this research, the researcher presented the mean of each item. To interpret the results, the questionnaire presented five options with the score mentioned in Table 2:

Table 2.   Score of The Questionnaire

| Variables | Score |
|---|---|
| Strongly Disagree (SD) | 1 |
| Disagree (D) | 2 |
| Neutral (N) | 3 |
| Agree (A) | 4 |
| Strongly Agree (SA) | 5 |

Furthermore, the researcher used means to examine the respondents' responses towards the items. This method was explained by Sugiono in Khairawati (2017). After finding out the mean for each item, the researcher interpreted the results with the criteria mentioned in Table 3 below:

Table 3.   Interpretation of Mean

| Mean | Interpretation |
|---|---|
| 1.00 − 1.79 | Strongly Disagree |
| 1.80 − 2.59 | Disagree |
| 2.60 − 3.39 | Moderate |
| 3.40 − 4.19 | Agree |
| 4.20 − 5.00 | Strongly Agree |

In addition, to draw the conclusion, the researcher used non parametric statistics, the Mann-Whitney U test for both questionnaires and documents. According to McKnight and Najab (2010) the concept of Mann-Whitney U test is similar to the T-Test. Both of them are used to determine whether there are any differences between two independent groups. However, the Mann-Whitney U test does not assume specific distribution of the samples.

## 3. Findings and Discussion

The results are divided into two parts. The first is students' perception about synchronous and asynchronous learning and the second is comparison of synchronous and asynchronous learning outcomes.

### 3.1. Students' Perception of Online Teaching Modes: Synchronous vs. Asynchronous

Based on the whole finding from the questionnaire, the highest mean value achieved by the fifteenth statement about the expensive cost of synchronous learning. Meanwhile, the lowest one comes from the sixteenth statement about difficulty in understanding asynchronous learning material. The detail for each item is shown in Table 4:

Table 4.    Students' Perceptions Descriptive Statistic

|  | Mean | Meaning |
|---|---|---|
| **Preference*** |  |  |
| I prefer synchronous to asynchronous learning. | 3.48 | Agree |
| **Motivation*** |  |  |
| I feel more motivated in synchronous classes. | 3.55 | Agree |
| I participate actively in synchronous classes. | 3.59 | Agree |
| I feel closer to the teacher and friends in synchronous classes. | 3.67 | Agree |
| **Materials*** |  |  |
| I can understand the learning materials easier in synchronous learning. | 3.73 | Agree |
| Asynchronous learning materials are easier to be accessed. | 3.90 | Agree |
| Synchronous learning gives more variative learning materials. | 3.78 | Agree |
| **Communication*** |  |  |
| Synchronous learning makes it easier to communicate with teacher and peers. | 4.01 | Agree |
| I feel braver to give my opinion in asynchronous learning | 3.40 | Agree |
| Synchronous learning facilitates easy accessed discussion place | 3.70 | Agree |
| Asynchronous learning facilitates more time to do discussion. | 3.81 | Agree |
| It is easier to give feedback in synchronous learning. | 3.75 | Agree |
| Learning problems are solved easier in synchronous learning. | 3.78 | Agree |
| **Obstacles**** |  |  |
| I often experience technical problems in synchronous learning. | 3.68 | Agree |
| Synchronous learning requires more expensive cost. | 4.12 | Agree |
| It is hard to understand asynchronous learning materials. | 3.22 | Moderate |
| ***Advantages** |  |  |
| ****Disadvantages** |  |  |

The first aspect discussed in this research is students' preferences. This research found that more students prefer using the synchronous method to the asynchronous one. This is supported by research conducted by Prasojo and Srisudarso (2021). They found that despite the benefits of asynchronous learning, students still wished to do synchronous learning using video conferences. As the time passed, the students found that it is boring to learn if they only use the asynchronous method. They also state that they know their teachers' names, but not their faces. Furthermore, they also think that it will be easier to understand the materials if the teacher explains it directly. Based on the process of collecting data, teachers who use only the asynchronous method in their teaching state that they only use WhatsApp Group or Google Classroom because most of the students were passive. There are only a few of them who join the class if it uses video conferences. It might be caused because the students do not have motivation to learn and there is no firm regulation from the school to apply both methods. The fact that teachers from the synchronous group did not have issues about students' presence should be reconsidered by the teachers from the asynchronous group.

In the term of motivation, students have positive perceptions towards synchronous learning. They feel more motivated to learn when they use the synchronous method and they are able to participate actively in the learning process. It also makes them feel closer to their teacher and friends. These findings are in accordance with the theory stated by Yamagata and Lynch (2014, in Perveen, 2016). They state that synchronous learning can improve students' motivation to engage in the learning activity because of the presence of teachers and friends. Meanwhile, the finding related to active participation in synchronous learning contradicts the finding of research conducted by Perveen (2016) which found that most of the students did not actively participate in synchronous learning.

The students also have positive perception towards synchronous and asynchronous learning materials. They agreed that it is easier to understand synchronous learning materials which are more variative. This is supported by research findings conducted by Prasojo and Srisudarso (2021) which state that it will be easier to understand the materials if the teacher explains the materials directly which can be done using the synchronous method. In addition, Dada et al. (2019) found that synchronous learning materials are more variative because it allows teachers and students to present a document or demonstrate a program. They also agree that asynchronous learning material is easy to be accessed. It is supported by a statement stated by Vidhiasi et al. (2021) who state that the use of asynchronous methods is effective to deliver the learning material because it is easier to be

accessed. Asynchronous learning materials usually are shared by the teacher on the Learning Management System (LMS) or WhatsApp Group. Therefore, they can save and open it anytime and anywhere as they want. Furthermore, Prasojo and Srisudarso (2021) also found that there are less technical problems in accessing asynchronous learning materials because it does not depend on their internet connection.

In the case of communication, students also have positive perceptions towards both methods. They agreed that synchronous learning creates a more interactive environment and facilitates real-time discussion. This is supported by research conducted by Arkorful and Abaidoo (2015). They state that synchronous learning allows students to discuss with the teacher and their peers directly at the same time. It is strengthened by statements stated by Kessler et al. (2021) that video conferences can facilitate small group discussion through 'breakout rooms' and it also provides text-chat tools that can help them to communicate. In the other hand, they also agree that asynchronous learning makes them feel braver to give their opinion and give them more time to do discussion. Because there is no time bound in asynchronous learning, students have more time to think the solution of the problem given, so that their answer will be more constructed (Perveen, 2016) which can make them be braver to state it to their friends or teacher (Narayana, 2016). Regarding giving feedback, students agree that synchronous learning makes it easier to give feedback and solve learning problems. This is supported by research findings conducted by Perveen (2016) that found instant feedback and answers given in synchronous learning can help students resolve any problem that they encounter in learning. Because synchronous learning provides real time communication, so if students face a problem or have not understood the materials, they can directly ask the teacher and get the answer immediately from the teachers.

In addition, communication and language are things that cannot be separated. According to Gulati et al. (2012), communication is a process of transferring information from one source to another. It can be done verbally and non-verbally. Furthermore, language provides the means to present information because it involves the ability to speak, read, write, and comprehend the information. Therefore, communication in English Language Teaching (ELT) is very important. It can help them exercise their basic skills in learning a language.

Regarding the learning obstacle, the students agree that they often face technical problems in synchronous learning and the costs for synchronous learning are more expensive. This is in accordance with the theories stated by Dada et al. (2019) that synchronous learning is more expensive because the internet data taken is bigger. To solve this problem, the government has been distributing internet data to teachers and students since September 2020 (Media, 2020 in Nugraha et al., 2020). Perveen (2016) states that students who do not have good internet connection can be frustrated because of technical problems or even could not join the class. This problem can be solved by creating a comfortable learning environment which can improve students' motivation to learn. If students have strong motivation to learn, they will prepare or do things that can make their learning process go well. Meanwhile, students did not find that asynchronous learning materials are significantly difficult to understand. It is supported by the research conducted by Prasojo and Srisudarso (2021) which found that if the teaching and learning process only uses asynchronous learning, students are struggling to understand the materials given. However, using video which is similar to direct instruction from the teacher as the learning media can be one of the alternatives to solve this problem.

The results on whether there are significant differences in students' perception towards the advantages and disadvantages of synchronous and asynchronous learning are shown in Table 5:

Table 5. Students' Perception Test Statistics

| Dimensions | Groups | N | Mean Rank | Asymp. Sig. (2-tailed) |
|---|---|---|---|---|
| Advantages | Synchronous | 596 | 603.93 | .455 |
|  | Asynchronous | 596 | 589.07 | |
| Disadvantages | Synchronous | 596 | 704.26 | .000 |
|  | Asynchronous | 596 | 488.74 | |

Based on the results of Mann-Whitney U Test, synchronous learning advantages obtained higher points. However, the significant value is higher than 0.05 which means that there is no significant difference in the students' perception towards the advantages of synchronous and asynchronous learning. Meanwhile, asynchronous learning disadvantages obtained lower points than the synchronous one. The significant value is lower than 0.05 which means that there is a significant difference in the students' perception towards the disadvantages of synchronous and asynchronous learning. In conclusion, students found that asynchronous learning is more beneficial for them.

Although synchronous learning provides many benefits, the disadvantages of this method can cause greater problems than the asynchronous one. The connection problems that are often faced by students make the voice and presented materials unclear which will affect students' understanding of the learning materials.

On the other hand, the majority of them did not have serious problems to understand asynchronous learning materials because asynchronous learning is more flexible. The materials are easier to be accessed (Vidhiasi et al., 2021). They agreed that asynchronous learning makes them feel braver to give their opinion (Narayana, 2016) and give them more time to do discussion (Perveen, 2016). In addition, they will feel more comfortable in asynchronous learning because they can use their own learning strategy (Kunin et al., 2014). They can also study the materials when they want to, so that they can be more focused in the learning process (Lin and Gao, 2020).

### 3.2. Students' Learning Outcomes: Synchronous vs. Asynchronous

The second finding about which method works better to achieve higher learning outcomes is presented in Table 6:

Table 6. Students' Learning Outcomes Test Statistic

| Groups | N | Mean | Mean Rank | Asymp. Sig. (2-tailed) |
|---|---|---|---|---|
| synchronous | 298 | 79.96 | 359.31 | .000 |
| asynchronous | 298 | 66.55 | 237.69 | |

Based on the results, this research found that the synchronous method works better because it achieves higher learning outcomes. It can be shown by the mean score gap of both methods. The gap shows that there is a difference in the amount of 13.41 points where the synchronous group outperforms the asynchronous one. It is in accordance with the research conducted by Farell et al. (2021) that found greater improvement in synchronous students' final score than the asynchronous one. Therefore, it means that synchronous learning works better to achieve higher learning outcomes.

Based on the findings, synchronous learning works because it is similar to conventional learning where the teacher helps students to understand the material by explaining it, so students can adapt to this method faster than the asynchronous one. This statement is supported by research findings conducted by Prasojo and Srisudarso (2021) which state that it will be easier to understand the materials if the teacher explains the materials.

Despite the weaknesses like connection problems and costs, synchronous learning gives a more interactive environment (Arkorful and Abaidoo, 2015) which is a very crucial thing in the teaching and learning process. In English Language Teaching, it is very important to practice to use the language in our daily communication. It can happen in synchronous learning which provides facilitations to conduct real-time communication (Kessler et al., 2021). Yamagata and Lynch (2014, in Perveen, 2016) also state that synchronous learning can improve students' motivation to engage in the learning activity because of the presence of teachers and friends.

### 4. Conclusion

Based on the research results and discussion, it can be concluded that students found that asynchronous learning is more beneficial. There is no significant difference in students' perception

towards the advantages of synchronous and asynchronous learning. However, in the terms of the disadvantages, asynchronous learning got lower mean ranks than synchronous learning.

Furthermore, based on the students' learning outcomes, it can be concluded that synchronous learning works better than asynchronous learning. It can be seen from the average score. The results showed that there is a significant difference between the two groups where the synchronous group received higher results than the asynchronous group.

Therefore, the researcher gives recommendations to the schools' staff and teachers that they combine both synchronous and asynchronous methods. The school can also make firm regulations for teachers to combine both methods so that it can be the external source of motivation for the teachers and students to conduct teaching and learning processes using both methods. Because this research only focuses on the advantages and disadvantages of synchronous and asynchronous learning in general, hopefully, there will be the continuation of this research to investigate this issue specifically in ELT.

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