

## USE OF *COMPUTER ASSISTED INSTRUCTION* TO IMPROVE STUDENTS' COMPREHENSION ON SYNTAX

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**ABSTRACT.** Syntex subject is one of the subjects that students of English Education Study Program should take it. Having online teaching in a pandemic situation is challenging for the instructor to build their students' comprehension of the concept of syntax, Structural Approach, and Syntactic Marker. Finding an appropriate tool is needed. *Computer-assisted instruction* was designed to be applied in the teaching and learning process to enhance students' comprehension of syntax subjects. There were 35 students involved in this study. This study was conducted in 14 meetings. Data were collected through pre-test and post-test. In data analysis, descriptive and Inferential statistics (t-test) were applied. The result of data analysis shows that students have a good comprehension of syntax. *Computer-assisted instruction* is effective in helping students to improve their syntax comprehension related to the concept of syntax, Structural Approach, and Syntactic Marker.

Keywords: *Syntax, Online learning, Computer Assisted Instructional*

### INTRODUCTION

Teaching and learning is a process of communicating between students and lecturers to conveying the message. In this situation of a pandemic, using media in teaching and learning is a must to run the class effectively. Barnes et al (2007) stated that ccommunication cannot be done effectively without using the media. Many various ways can be used to deliver materials such as zoom, WhatsApp, telegram, google classroom, and Edmodo. It is challenging for any instructors to choose any media to help them to conduct teaching and learning effectively. Computer-assisted instruction (CAI) is one of the media that can be used to helps instructors and students communicate effectively. Media that

functions to convey learning messages so that the thoughts, feelings, concerns, and interests of students that lead to the learning process are called learning media. Several types of learning media can be used in the learning process in the classroom. Heinich, et al (1982) stated that the media is a means of communication channels. Computer media is used in learning because it provides advantages that other learning media does not have, namely the ability of computers to interact individually with students (McGreal, 1988). Thompson (1980) explains that computers are an effective learning delivery medium.

Padmanthara (2004) also added that computer-assisted learning (CAI) can provide positive values such as the

following: (1) involve students/learners actively in the learning process. Activeness and involvement in this process help to accelerate learning, (2) students/learners can continue learning according to their own pace and learning ability which means providing opportunities to progress both those who are slow and fast learner), (3) *reinforcement* which in theory learning is one of the factors that support effective learning, can be displayed immediately and systematically, (4) computer simulations provide explosive chemicals in the simulated laboratory without harming oneself and damaging the lab, and (5) remedial teaching or repetition for students/students who have not achieved adequate achievement, for example, using computer-assisted learning (CPB) to catch up by studying and working alone. The strategy of using media as a companion in the learning process is needed to overcome problems in learning due to limited time, space, and pandemics. Well-packaged learning can have a positive impact on increasing the ability to understand syntax material. Along advances in communication and information technology have changed computer-based learning patterns. Computer-based learning is a learning model that uses computer devices. Computer-based technology applications are known as *Computer Assisted Instruction (CAI)* (Arsyad, 2011).

*Computer-Assisted Instruction (CAI)* is a development of integrated information technology in communication (interactive), audio, *video*, image appearance (*image*) that is packaged as a multimedia technology. *Computer-Assisted Instruction (CAI)* includes the use of computers that are directly related to students and educators. In this case, *Computer Assisted Instruction (CAI)* can be used to teach and train in

learning a scientific discipline. The models contained in *Computer Assisted Instruction (CAI)* are in the form of tutorials, *drills*, and *practice*, and *problem-solving*. Media CAI focuses the attention of students and motivates students to want to learn so that the material provided can be conveyed. CAI media also provides learning aids that are easy to use and have quality appeal so that they can attract the attention of students to take part in learning and improve learning outcomes (Cahyaningrum, 2020).

The advantage of learning using *Computer Assisted Instruction (CAI)* is that it makes it easier for students to repeat the material they have obtained and studied it regularly until students find the meaning of the material provided. Learning the repetition syntax of the material is very important because Many materials require deep understanding and even memorizing some formulas. In this study, researchers used a computer assistant model in the form of material integration using electronic pocketbooks in the form of pdf, zoom applications, and google forms.

### **Electronic Pocket Book**

The use of *electronic pocketbooks* on syntax material, *E-books*, or *electronic books* is an evolution from printed books that we usually read everyday (Subiyantoro, 2014). Electronic books contain information in the form of text or images. Electronic books emerged with advances in communication and information technology (Rahardjo, 2002). The use of media in the learning process has a function as a carrier of information from educators to students (Daryanto, 2010). Learning media used in the lecture process need to be integrated with the use of technology so that students are ready to face the world of work. One of

the students learning media that implements technology and communication developments with user interaction that is currently being developed is a digital book or known as an *ebook* (Mentari et al, 2018). In this study, e-books are used as a form of innovation from teaching materials as a tool in the lecture process. The syntax material presented is a summary that is made simpler and easier for students to understand. *Pocketbook* This also contains formulas and tips on syntax metrics that are very important for prospective teachers to master.

Suparno (2018) explains that E-books help students in the learning process outside of class or at home. Students who have internet access at home can download the E-book from the site or can also find free internet access in the hotspot. In this study, the *electronic pocketbook* in question is a teaching material that contains a summary of the material designed and summarized by researchers from several sources and made in the form most easily understood by students. This electronic pocketbook is used as a companion in the teaching and learning process, students still need a teacher as a companion in the first explanation; this study was accompanied by the use of CAI online with a zoom application.

One of the students learning media that implements technology and communication developments with user interaction that is currently being developed is a digital book or known as an *e-book* (Mentari et al, 2018). Digital books, or also known as *e-books*, are a publication that consists of text, images, as well as sound and published in digital form can be read on a computer or device other electronics such as android, or tablet (Andikaningrum et al. 2014). *E-book* or *electronic book* (or also a *digital book*) is an evolution from the printed books we are used to

reading everyday (Subiyantoro, 2014). The electronic pocketbook in this study consists of an introduction which includes a foreword, table of contents, learning background, learning objectives, short descriptions, and online lecture instructions, syntax material which is divided into two topics. The first topic discusses syntax in the structural approach and syntactic markers, while the second topic discusses syntactic, lexical, and phrasal categories

### **Zoom application**

Application is used as a companion media that functions for *Computer-Assisted Instructional*. The researcher, who also acts as a lecturer, will direct the online recovery by giving several directions that lead to material based on the electronic pocketbook syntax that has been distributed to students. Arnesti & Hamid (2015) explain that the advantages of using *online* learning are independent learning and high interactivity, being able to increase memory levels, provide more learning experiences, with text, audio, video, and animation, all of which are used to convey information, and also provide ease of submitting, updating content, downloading, students can also send *emails* to other students, post comments on discussion forums, user rooms *chat*, to *link video conferencing* to communicate live.

The use of the zoom application chosen in this study was also caused by the COVID-19 pandemic that is currently hitting the world, so all parties are asked to maintain their distance. The zoom application is used because it has the advantage of having a large space capacity, the best video and sound quality, various attractive features available, supports presentations, has a video on/off feature, and

is available on a variety of devices. Harun (2020) added that several advantages, *Zoom Cloud Meetings* namely has had features *video conferencing* HD quality, *online meetings*, *chat*, supporting up to 1,000 participants, recording, and scheduling *meeting*. This study also uses a zoom application. During the zoom meeting, the lecturer or researcher directs students and opens a discussion session according to the material available in the electronic pocketbook syntax that has been distributed. The zoom application is also used to explain the instructions that students have to do about assignments and evaluation materials. Online learning through Computer-assisted instruction via Zoom is more fun, learning online has been effective. On the other hand, it also has obstacles, namely internet connection problems (Pratiwi, 2020).

This study aims to enhance students' comprehension of syntax by using *Computer-Assisted Instruction*. The *Media Computer-Assisted Instruction (CAI)* is used by using the electronic *pocketbook* and zoom. Two models have functions and goals that support each other. The pocketbook of syntax is used as a teaching material which contains short material about syntax wherein the material is designed by researchers to suit the students' needs.

The use of zoom application as a medium of instruction and discussion guided directly by lecturers/researchers, however, is only used in online classes as the main media for *Computer Assisted Instruction (CAI)*. In this study, the lecture material was given through the Whatsapp group. From the beginning till the end of the lecture, tests were given in the form of pre-test and post-test.

## RESEARCH METHODOLOGY

### Research design

This study employs a quantitative research method with a pre-test and post-test design. The tests were designed based on the five topics to be discussed on syntax subjects; consists of the concept of syntax, Structural Approach, and Syntactic Marker. The tests were intended to measure students' comprehension of syntax before and after the implementation of *Computer Assisted Instruction* in the teaching and learning process. Sudjono (2001) explains that the *pretest* or initial test is a test that is carried out to find out to what extent the material or subject matter to be taught has been mastered by students. While the *post-test* or final test is a test that is carried out to find out whether all the material that is classified as important can be mastered properly by students. The methods and strategies used by giving pretest-posttest help teachers to evaluate and to improve teaching activities, increase the students' motivation and interest as well as readiness in the learning process (Effendy, 2016).

### Participants

This research was conducted at a university in North Maluku, Indonesia. There are 35 students of the English Education Study Program who enroll in syntax participating in this study. The students have been studied English for two years. They come from different provinces in Indonesia, such as North Maluku and Maluku, Sulawesi, and Java with different educational backgrounds.

### Data Analysis

- a. The data have been collected from students' syntax Comprehension test was analyzed by using the following

procedure. Students' correct answer graded by using the formula:

$$\text{Score} = \frac{\text{Obtained score}}{\text{Maximum Score}} \times 100$$

- b. After tabulating the students' scores, the researcher classified the students' scores based on the following table below of the rating scale.

**Table 1. Students' Score classification score of syntax achievement**

No	Score	Classification
1	86-100	very Good
2	71-85	Good
3	56-70	Average
4	41-55	Poor
5	< 40	Very Poor

(Depdiknas in Hasriani, 2013, see also Assidiq, 2020)

- c. Calculating the mean score, standard deviation, t-test value, and significant difference between pre-test and post-test, they were analyzed using SPSS program 20.0Version

In analyzing data, the researchers employed descriptive statistical analysis (T-test). The analysis was intended to describe students' comprehension of syntax consists of the concept of syntax, Structural Approach, and Syntactic Marker. While pre-experimental with pre-test and post-test design, inferential statistics (t-test) was used to determine the significant improvement of students' comprehension of syntax.

## RESULT AND DISCUSSION

The effectiveness of implementing the *computer-assisted instructional design* can be seen from the increased students' comprehension of the concept of syntax,

Structural Approach, and Syntactic Marker in syntax subject. Students' comprehension can be observed from the result of data analysis were describe into the frequency, mean score, and standard deviation of pre-test and post-test.

### a. Description of a pre-test of students' comprehension of syntax

The students' comprehension of syntax subject (the concept of syntax, Structural Approach, and Syntactic Marker) in the pre-test can be described in table 2 below:

Table 2. The distribution of frequency and percent of pre-test

Classification	Students' of pre-test	
	Frequency	%
very Good	0	0 %
Good	0	0 %
Average	1	2,9%
Poor	13	37,1%
Very Poor	21	60%
<b>Total</b>	<b>35</b>	<b>100%</b>

Table 2 provides information about students' comprehension of the Concept of Syntax, Structural Approach, and Syntactic Marker in syntax subject of the pre-test. Table 2 shows that in five classifications of students' comprehension on syntax subject before using computer-assisted instruction in the frequency and percentage classified as very poor level. It can be observed from students' scores. 21 students obtained scores that classified as very poor level or (60%) percent of the total participants. While 13 students received a score that is classified as a poor level or 37,1% of total participants and 1 student received scores that are classified as average level or 2,9% of the total.

**b. Description of post-test of students' comprehension of syntax**

The students' comprehension of syntax subject (the concept of syntax, Structural Approach, and Syntactic Marker) in the post-test can be described in table 2 below

Table 3 The distribution of frequency and percentage of post-test

Description of Post-Test	Students' of pre-test	
	Frequency	%
very Good	7	20%
Good	25	71,4%
Average	2	5,7%
Poor	1	2,9%
Very Poor	0	0%
<b>Total</b>	<b>35</b>	<b>100%</b>

Table 3 shows that the result of the post-test score after using computer-assisted instruction are described in the form of frequency and percentage. Based on the table above that 71,4% of total participants obtained scores which are categorized as good level, followed by 20% of total participants or 7 students got scores very good. The other 3 participants are categorized as average and poor level, consist of 2 students or 5,7% at the average level and 1 student or 2,9% at the poor level.

In supporting data provided in table 2 and table 3, the calculation mean score and standard deviation of students' pre-test and post-test presented in table 4, is intended to support the finding of students' comprehension of before and after using computer-assisted instruction.

Table 4. Descriptive statistic analysis

	N	Min	Max	Mean score	Std. Deviation
Pretest	35	15.00	67.00	39.54	9.93
Posttest	35	55.00	95.00	79.80	7.54
Valid N	35				

The table shows the result before and after using *Computer Assisted Instruction (CAI)* in teaching syntax (*on the concept of syntax, Structural Approach, and Syntactic Marker*). The results obtained in the pre-test with the mean score or the average value of 39.54 and the highest score is 65, while in the mean score of post-test or the average overall score is 79.80 and the highest score is 95. Students' comprehension of the concept of syntax, Structural Approach, and Syntactic Marker had increased. The difference between the pre-test and post-test results can be determined by analyzing the mean and standard deviation. The results of the analysis show that the mean score of post-test after participating in learning using *Computer Assisted Instruction (CAI)* is categorized as higher than pre-test. The results show that the use of *Computer Assisted Instruction (CAI)* can increase students' comprehension of the concept of syntax, Structural Approach, and Syntactic Marker in syntax subjects.

Also, data were analyzed by using SPSS version 20.0. It is intended to the significant differences between students' comprehension achievement before and after using *computer-assisted instruction*. The results analysis is presented in table 5:

Table 5 Result of pre-test and post-test analysis

Analysis inferential	
Paired Samples Statistics	

	Mean Score	N	Std. Deviation (SD)
Pretest	39.54	35	9.93
Posttest	79.80	35	7.54
Difference	40.46		

The table above indicates that the difference of mean score of pre-test and post-test, the mean of post-test (79.80) and SD 7.53 is higher than pre-test (39.54) and SD 9.93 which is categorized as poor and the difference mean from pre-test and post-test is 40.46. It means that The use of *Computer Assisted Instruction (CAI)* in teaching can improve students' comprehension of syntax (*in the concept of syntax, Structural Approach, and Syntactic Marker*). In this study, the impact of using *Computer Assisted Instruction (CAI)* can be seen from the students' pre-test and post-test scores. The finding of this study shows that the use of Computer-assisted Instruction can improve students' comprehension of syntax (*in the concept of syntax, Structural Approach, and Syntactic Marker*) consistent with Harjanto et al (2012) who explain that the use of CAI can improve learning outcomes and learning motivation. Astuti (2016) also adds that there is an effect of increasing students' abilities on the use of *Computer Assisted Instruction (CAI)* in learning. Further, Fitriani et al (2019) explains that the use of *Computer Assisted Instruction (CAI)* can increase students' motivation and students' learning outcomes. It can be concluded that the use of computer-assisted instruction can improve students' comprehension of syntax.

Table 6 P\_value of T-test of the students' comprehension of syntax

Paired Sample Test

Pair 1		Paired Differences		t	df	sig (2 tailed)
		Mean	Std Deviation			
1	before after	40.25	9.19	25.9	34	.000

A paired sample t-test was conducted to see a significant difference between students' comprehension of syntax (*in the concept of syntax, Structural Approach, and Syntactic Marker*) before and after using Computer-assisted instruction (CAI). It can be seen in Table 6 that the P-value of students' comprehension of syntax (*in the concept of syntax, Structural Approach, and Syntactic Marker*) was 0.000 with a degree of freedom was 35. It shows that the P-value of students' syntax comprehension was smaller than the level of significance which was 0.05 ( $0.000 < 0.05$ ). It indicated that significant differences between students' comprehension of syntax before and after treated using computer-assisted instruction.

## CONCLUSION

The finding of this study shows that the use of *Computer Assisted Instructional* that can be used to improve learning outcomes in teaching and learning. The use of electronic *pocketbooks* and zoom applications can increase students' learning outcomes. This can be seen from students' comprehension of syntax before and after treatment using computer-assisted instruction improvement. This study was conducted at the University level that can be challenging for the next researcher in the future to conduct research at other levels of education.

On the other hand, it challenges teachers to use CAI in teaching and learning it is because of several facilities, such as electronic devices that students should have an internet connection is a need. The students should have an electronic device to have the availability of materials and internet connection to have zoom meetings and getting explanations.

## REFERENCE

- Agustin, L. Haryanto, Z., & Efwinda, S. (2020). Pengaruh Model Pembelajaran Inkuiri Terbimbing terhadap Kemampuan Berpikir Kritis Siswa Kelas XI SMA Negeri 9 Samarinda. *Jurnal Literasi Pendidikan Fisika*, 1(1), 56-64.
- Andikaningrum, L., Damayanti, W., & Dewi, C. (2014). *Efektivitas E-Book Berbasis Multimedia Menggunakan Flip Book Maker sebagai Media Pembelajaran dalam Meningkatkan Keaktifan Belajar Siswa (Studi Kasus pada Mata Pelajaran TIK Kelas XI SMA Kristen Satya Wacana Salatiga)* (Doctoral dissertation, Program Studi Pendidikan Teknologi Informasi dan Komunikasi FTI-UKSW).
- Arnesti, N., & Hamid, A. (2015). Penggunaan Media Pembelajaran Online - Offline Dan Komunikasi Interpersonal Terhadap Hasil Belajar Bahasa Inggris. *Jurnal Teknologi Informasi & Komunikasi Dalam Pendidikan*, 2(1). <https://doi.org/10.24114/jtikp.v2i1.3284>.
- Arsyad, A. (2011). *Media Pembelajaran*. Jakarta: PT Raja Grafindo Persada.
- Assidiq, M., A. (2019). Authentic materials reading comprehension classroom: Its effectiveness to Indonesian EFL students' achievement. *International Journal for Education Vocational Studies*, 1 (7), 707-712
- Astuti, Seti Puji. (2016). Pengaruh Penerapan Media CAI (Computer Assisted Instruction) Terhadap Peningkatan Kemampuan Mengenal Alfabet di TK PL Bernardus Semarang. *Skripsi tidak diterbitkan*. Semarang: PPs Universitas Negeri Semarang.
- Barnes, K., R. Marateo, & S. Ferris. (2007). Teaching and learning with the net generation. *Innovate* 3 (4).
- Cahyaningrum, A. (2020). Pengembangan Media CAI (*Computer Assisted Instruction*) Materi Sistem Pencernaan Manusia Pada Mata Pelajaran Biologi Kelas VIII Mts Maskumambang Gresik. *Jurnal Mahasiswa Teknologi Pendidikan*. 10(0.29).
- Daryanto. (2010). *Media Pembelajaran Peranannya Sangat Penting Dalam Mencapai Tujuan Pembelajaran*. Yogyakarta: Gava Media.
- Effendi, I. (2016). Pengaruh pemberian pre-test dan post-test terhadap Hasil Belajar Mata Diklat hdw.dev.100.2.a pada siswa Smk Negeri 2 Lubuk Basung. *Jurnal Ilmiah Pendidikan Teknik Elektro*. 1(2). 81-88.
- Fitriani, L. Buchori, A & Nursyahidah, F. (2019). Pengaruh Penggunaan Media Pembelajaran Kahoot Dengan Model Pembelajaran *Computer Assisted Instruction* (CAI) Terhadap Hasil Belajar Siswa. Seminar Nasional Matematika dan Pendidikan Matematika (40.292 Senatik)



- Program  
Studi Pendidikan Matematika  
FPMIPATI-Universitas PGRI  
Semarang.
- Harjanto, Arif, Prahasto, T & Suhartono, (2011). Rancang Bangun Computer Assisted Instruction (CAI) Sebagai Media Pembelajaran Dalam Mata Pelajaran Fisika Sekolah Menengah Atas. (<http://ejournal.undip.ac.id/index.php/jsinbis/issue/view/289>).
- Harun, M. (2020). Evaluasi kualitas Perangkat Lunak Pada Aplikasi Zoom Cloud Meetings untuk Pembelajaran Elearning. *Jurnal Akrab Juara*. 2(3). 102-112.
- Hasriani. (2013). Using folktales with pictures in improving students' writing at SMP 10 Makasar. Unpublished Thesis. Graduate Program of UNM.
- Heinich, R., Molenda, M., & Russel, J.D. (1982). *Instructional Media and The New Technologies of Instruction*. New York: John Wiley & Sons.
- Karyadi, B. Yanuardi & Wibowo, S. (2020). Pengaruh Metode Pembelajaran Computer Assisted Instruction (CAI) dan Ekspositori Serta Kemandirian Terhadap Hasil Belajar Keahlian Komputer dan Pengelolaan Informasi (KKPI). *Jurnal Teknologi Pendidikan*. 9(1).
- Mansor, A. Z. (2012). Managing Student's Grades and Attendance Records using Google Forms and Google Spreadsheets. *Procedia - Social and Behavioral Sciences*, 59, 420-428.
- <https://doi.org/10.1016/j.sbspro.2012.09.0296>
- McGreal, R. (1988). Computer-Assisted Instruction: Non-human but Not Inhuman. *FORUM*. XXVI (3):15-17.
- Mentari, D. Sumpono & Ruyani, S. (2018). Pengembangan media pembelajaran e-book berdasarkan hasil riset elektroforesis 2-d untuk mengukur kemampuan berpikir kreatif mahasiswa. *PENDIPA Journal of Science Education*. 2(2), 131-134. ISSN 2086-9363.
- Padmanthara, S. (2004). Pembelajaran Berbantuan Komputer (PBK) Dan Manfaat Sebagai Media Pembelajaran. *Jurnal Tekno*, Vol:1, Februari 2004, ISSN: 1693-8739
- Pratiwi, E. W. (2020). Dampak Covid-19 Terhadap Kegiatan Pembelajaran Online di Sebuah Perguruan Tinggi Kristen di Indonesia. *Jurnal Perspektif Ilmu Pendidikan*. 34(1). DOI: [doi.org/10.21009/PIP.341.1](https://doi.org/10.21009/PIP.341.1).
- Slameto, (2003). *Belajar dan Faktor yang Mempengaruhinya*. Cet. IV; Jakarta: Rineka Cipta.
- Subiyantoro, E. (2014). Menapak di Era Digital dengan Memasyarakatkan Buku Digital. [http://www.vedcmalang.com/pppstkboemlg/index.php/menu\\_utama/teknologiinformasi/1114-eko-subiyantorowidyaiswara-muda-departementeknologiinformasi-pppstk-boe-malang](http://www.vedcmalang.com/pppstkboemlg/index.php/menu_utama/teknologiinformasi/1114-eko-subiyantorowidyaiswara-muda-departementeknologiinformasi-pppstk-boe-malang) (diakses pada 15 Mei 2017)



Sudjana (2002) *Metode Statistika*, Bandung:  
PT. Tarsito.

Sudjono, A. (2001).  
*Pengantar Evaluasi Pendidikan*. Jakarta: Raja  
Grafindo Persada.

Suparno, S. (2018). Development of E-Book  
Multimedia Model to Increase  
Critical Thinking of Senior High

School Students. *Dinamika Pendidikan*,  
12(2), 196-206.  
[https://doi.org/10.150.294/dp.v12i  
2.13567](https://doi.org/10.150.294/dp.v12i2.13567)

Thompson, B.J. (1980). Computers in  
Reading: A Review of Application  
and Implications. *Educational  
Technology*. XX (8): 38-41.