SCHOOLOGY-AIDED INSTRUCTION: MEASURING THE EFFECTIVENESS FOR STUDENT-TEACHERS' READING COMPREHENSION ACHIEVEMENT

[1]Masagus Firdaus, [2]Santi Mayasari

[1]English Lecturer, Graduate Program, University of PGRI Palembang, Indonesia
[2]English Lecturer, Fishery and Marine Faculty, University of PGRI Palembang, Indonesia
Corresponding Author Email: masagus26firdaus2026@gmail.com

Article Info	Abstract
	Reading comprehension plays significant roles in grasping precious information. However, this skill seems difficult for most of student-teachers to complete properly. Thus, this study is oriented to cover this phenomenon. In this quasi experimental method, there were 80 student-teachers who were clustered as the experimental and control. They were treated for eight meetings. Both pretest and posttest instruments were integrated for collecting the data. To figure out the improvement of the two groups, t-tests, i.e., paired and independent, were employed. The findings showed that in pretest, both groups encountered problems related to reading comprehension. However, after being treated with this Schoology learning management system (LMS), experimental group students gained better achievement in reading comprehension comparing to control group. Mean scores of experimental group (75.250) was bigger than control group gained (61.875). By the same token, the F-test score (0.392) with df (78) and sig. value (0.000) informed about different qualities gained by both groups, i.e., experimental and control. In a nutshell, the integration of Schoology LMS is more effective in increasing students' reading comprehension comparing to conventional mode of learning.

INTRODUCTION

Reading is a part of language skills that has a precious position in language learning. Through reading activity, students not only can enrich their knowledge, but also can understand other disciplines. Brown (2004) claimed that reading as a receptive skill remains as a precious skill in all education contexts. It is also assumed as a complicated, dynamic, and interactive course which encourages readers to use sub skills in decoding and inferring the variety of texts. This deals with the ability to draw ideas grasped from printed reading material with appropriate interpretation by the assistance of skills and strategies (Jafri, 2017; Masduqi, 2014). Another similar vein, reading plays its crucial function in language acquisition (Harmer, 2007). This is because when intensity plays its precious position in determining students' success in gaining information or knowledge. This means that spending more time for reading activity in the classroom can promote better reading comprehension.

In the same vein, reading comprehension as the main terminal of reading skill has a pivotal role in grasping ideas from reading materials. This trustworthy skill can assist to cover the needs of the 21st century language learning (Daff & Ahmed, 2016; Snow, 2002). In obtaining better reading comprehension achievement, students need to elaborate prior knowledge and precious elements of reading materials (Klingner, et al., 2007). They further noted that in understanding the meaning of reading materials, students need to combine both

syntactical and semantic knowledge to construct meaning or ideas of reading materials. It can be noted that reading comprehension involves a series of cognitive processes which is solely aimed at exploring and generating ideas from printed texts by the assistance of prior knowledge. Since reading comprehension is not an easy matter, instructors need to play their optimal roles for their learners, e.g., encouraging students to deeply participate in reading comprehension instruction, providing appropriate and meaningful learning materials and activities to students, promoting students to actively discuss their constraints in reading comprehension instruction, and giving constructive and trustworthy feedback toward students' assignments and exercises. By these all means target language set up in advance can be realistic.

In this 21st century language instruction, the ideal target of reading comprehension instruction is empowering students with higher order thinking skills (HOTS). By this context, reading comprehension instruction is both directed to high and low levels of thinking skills. Singh and Shaari (2019) stated that by possessing HOTS, students can be encouraged and practiced to analyze, synthesize, and evaluate any kinds of reading materials. In addition, they can be invited to create and share ideas in classroom discussion. By similar tone, Frutas (2019) stated that when students have possessed HOTS, they can determine and integrate information obtained from reading activity. By this condition, HOTS can endorse to analyze, synthesize, evaluate, and create ideas grasped from reading materials (Frutas, 2019). In short, it can be denoted that equipping students with HOTS can be very precious for students in their learning process.

In relation to the target of HOTS attainments as aforementioned, reading materials selected can be oriented to providing students better levels of reading comprehension as mentioned in Barrett's Taxonomy (Gocer, 2016). The arrangement of the levels is from the easiest to the hardest one. In this taxonomy, literal, reorganization, and inferential levels are referred to cognitive domain, while evaluation and appreciation levels deals with affective domain. In similar vein, Javed et al. (2020), claimed that literal, reorganization, and inferential levels of reading comprehension deal with the teaching of language skills, while appreciation and evaluation levels are related to the teaching of literature, i.e., how to value and appreciate one's work.

Unfortunately, up to now reading comprehension subject still becomes pivotal constraints which need to deal with. EFL Students look difficult to have better reading comprehension skill (Lustyantie & Aprilia, 2020). They further noted that students are much more asked to do reading comprehension activities and materials oriented to LOTS. They are rarely endorsed to conduct reading comprehension activities that deal with HOTS. In this virtual era, students and instructors are insisted to change their learning condition from fully brick-and-mortar classroom setting into blended or even fully online learning mode. This also promotes problems which need to solve immediately, e.g., instructors and students' technological knowledge, selection of appropriate reading materials, and the integration of suitable strategies for reading comprehension instruction. Thus, it is quite unsurprising to say that failure in reading comprehension certainly comes to many students.

There are several possible factors causing the failure of EFL students in reading comprehension subject (Golonka, et al., 2014; Khan, 2011; Zamani & Ahangari, 2016). 1) There are too many students joining reading comprehension subjects in every class. Classroom learning nuance cannot be much educative and conducive when big classes occur without proper learning facilities and strategies. By this condition, instructors get trapped on how to manage classroom learning. 2) Instructors do not provide clear stages of instructions from pre, while, and post reading activity in their learning process. When students are faced with unclear stages of learning process, they tend to have confusion and feel frustrated with their learning process. As a result, they become low learning motivation students (Jung,

2005). 3) The selection of reading materials is not based on students' reading needs and they are considered as outdated reading materials. It is so unlucky to state that when reading materials are not relevant to what students need to read, it certainly will not optimally contribute to students' reading comprehension progress (Jung, 2005). 4) There is a limited chance for students to interact and collaborate in reading comprehension class (Chen et al., 2016; Tümen-Akyıldız, 2019). Ideally, students are offered more time to collaborate and discuss reading comprehension materials. This is very crucial because they can explore their reading interest and mind. In short, all possible factors contributed to the failure of reading comprehension learning. As a consequence, learning target or learning outcome which had been set up could not be optimally achieved.

Considering the above problems related to reading comprehension instructions and achievement as aforesaid, it is a great novelty to involve digital pedagogy in reading comprehension classroom. Ahmad (2012) explained that students' learning motivation can be easily promoted by integrating digital pedagogy in language learning. By the same vein, other scholars (Buabeng, 2015; Hismanoglu, 2011; Indrašienė, et al., 2015) stated that technology integration in language learning can postulate meaningful contribution for both students and instructors. In similar vein, Perron, et al. (2010) denoted that technological application can be used to send, transform, manage, and keep instructional data, i.e., materials and activities. Thus, it is clear that education technology can accommodate learning process, i.e., the process can be more flexible and enjoyable while at the same time promotes trustworthy contribution to students. This idea is similar to what Jung (2005) has claimed. He stated that flexibility and effectiveness of language instructions can be conducted through the involvement of digital technology.

One of digital technology applications that can be used in educational setting is *learning management system (LMS)*. An LMS is the latest education technology application that can assist instructors to prepare, manage, control, and evaluate learning input, process, and output in a rigid system. It has simple and attractive features that can promote students and lecturers to have meaningful learning. Abdellah (2016) postulated that the integration of LMS could promote significant contribution toward instructional reading activities of students due to its capability in simplifying the processes. By integrating an LMS, there will be exploration of classroom activities, e.g., connecting students and instructors, delivering meaningful and attractive instructional materials, and simplifying classroom instructional activities with tasks of administration. In similar vein, Essel (2018) claimed that several positive profits which can be explored from integrating LMS, i.e., flexibility for place and time, information data share, online instructional materials, and various meaningful instructional experiences. Furthermore, by the same token, Ferdianto and Dwiniasih (2019) firmly stated that there are many positive effects of integrating LMS, e.g., Schoology, such as simple and meaningful collaboration between instructor and students, simple submission process of students' exercises and assignments, meaningful learning experience, measurable and recordable instructional activities.

In this 21st century learning, the integration of LMS can assist to provide well-managed learning materials and activities, and encourage students to be autonomous learners or self-determined learners. Low (2017) claimed that instructors are required to prepare, provide, facilitate, and monitor a learning process. The assistance of education technology in this twenty-first century language learning can ascertain learning materials given to students are well-established, meaningful, and easy access. In addition, learning materials and activities given can be assumed as authentic and meaningful learning resources. Another similar tone is from Golonka, et al. (2014). They notified ideas related to students learning interest and spirit could be endorsed by technological education involvement. By integrating LMS, EFL students are engaged to be self-supporting and self-determined learners (Ardi, 2017; Shadiev

& Yang, 2020; Solano et al., 2017). According to Narayan et al., (2017), self-determined learning can provide students opportunity to determine learning materials and decide the process on how to grasp ideas of learning materials. By the same token, Arifin et al., (2019) postulated that students are directed to control and reflect their own way of English language learning process and progress. By this situation, instructors are expected to control the instruction process and provide assiatance whenever needed. In addition, Gangalakshmi and Naganathan (2019) explained that students are very much trained to have technological knowledge in relation to the processss of grasping and understanding digital instructional materials integrated in EFL learning. As a consequence, students can gain satisfaction dealing with their learning outcome (Badaruddin et al., 2019).

By examining closely toward the advantages of integrating LMS in language learning, the researcher then integrated Schoology as an LMS in reading comprehension instruction for EFL student-teachers at tertiary level of education in Palembang-South Sumatra. This research is promoted to figure out (1) the improvement of the student-teachers' reading achievement after being instructed by conventional mode of learning; (2) the student-teachers' learning progress after being promoted by integrating Schoology LMS as a mode of learning; and (3) which mode of learning is more effective in elevating student-teachers' reading comprehension achievement.

RESEARCH METHOD
Research Design
A quasi-experimental design was employed to elevate EFL student-teachers' reading comprehension achievement (Gay, et al., 2012). The following scheme notified the research design.

$$O_1 \qquad X \qquad O_2$$
$$O_3 \qquad X \qquad O_4$$

Remarks: O_1 : Pretest (Experimental Group);
          O_2 : Posttest (Experimental Group);
          O_3 : Pretest (Control Group); and
          O_4 : Posttest (Control Group)

From this scheme, it could be notified that both groups at the early stage were assessed their prior reading comprehension skill by completing preliminary testing. After that, the experimental group student-teachers were directed or treated by the involvement of Schoology LMS as the mode of instruction, whereas the control group employed conventional mode of learning. After several times for treatment activities, the two groups were provided the posttest. This was to measure student-teachers' reading comprehension achievement progress.

Population and Sample
In this study, all second semester student-teachers from two private universities in Palembang-South Sumatra were the population, while the sample of the study was taken by integrating cluster random sampling, i.e., one group from each university as the sample. There were eighty students participated in this study, e.g., forty student-teachers as control group, and the other forty as the experimental one. In collecting trustworthy data, the researcher employed firstly validated research instruments. Both pretest and posttest instruments were used to gather preliminary and post data of the student-teachers' reading comprehension. The research instruments consisted of forty questions and were oriented to Barrett's taxonomy of reading comprehension.

Data Analysis

In this study, the researcher employed several stages in analyzing the collected research data. The researcher integrated two types of statistical analysis, namely descriptive and inferential. Descriptive statistical analysis was directed because the researcher wanted to notify more ideas about the data gained from the lowest to the highest of all research groups both in pretest and posttest in terms of frequency and percentage analysis. Whereas the employment of inferential statistical, which covers parametric and nonparametric, was oriented to postulate inferences related to population according to the findings gained from the samples.

The researcher firstly described students' low and high scores, i.e., pretest and posttest, of the two groups in the form of distribution table of frequency. Then, before coming to the inferential statistical analysis, the researcher analyzed normality and homogeneity of the samples in order to determine whether parametric measurements could be administered. When the data met the idea of normality and homogeneity, the researcher would continue to parametric techniques of measurement. In parametric measurement, the researcher employed two types of t-tests, i.e., correlated and independent t-tests. Correlated t-test was integrated to view the mean score difference of the same group, while independent t-test was aimed at showing mean score differences between the two groups after being treated with different types of learning strategy or mode.

RESEARCH FINDINGS AND DISCUSSION
Research Findings

Pretest Scores of the Experimental Group

After the data of the experimental group students in pretest were collected and analyzed, it was found out that the highest score was 55, whereas the lowest score was 20 with 38 as the mean score. In addition, there were only three students (7.5 %) who could get the score higher than or equal to 50, while the other 37 (92,5%) students got lower than 50. The data could be seen in table 1 below.

Table 1
Pretest Scores of the Experimental Group

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	20.00	1	2.5	2.5	2.5
	25.00	2	5.0	5.0	7.5
Mean : 38.00	30.00	6	15.0	15.0	22.5
Median : 40.00	35.00	10	25.0	25.0	47.5
Minimum : 20	40.00	9	22.5	22.5	70.0
Maximum : 55	45.00	9	22.5	22.5	92.5
	50.00	2	5.0	5.0	97.5
	55.00	1	2.5	2.5	100.0
	Total	40	100.0	100.0	

Pretest Scores of the Control Group

By the same token, when the data of the control group students in the pretest were obtained and analyzed, it was noted that 65 was the highest score, while 30 was the lowest one with 47.8750 as the mean score. Furthermore, there were 21 students (52.5 %) who could grasped scores higher than or equal to 50, while the other 19 students (47.5%) got lower than 50. The data could be viewed from table 2 below.

Table 2
Pretest Scores of the Control Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	30.00	1	2.5	2.5	2.5
	35.00	3	7.5	7.5	10.0
Mean : 47.87	40.00	5	12.5	12.5	22.5
Median : 50.00	45.00	10	25.0	25.0	47.5
Minimum : 30	50.00	9	22.5	22.5	70.0
Maximum : 65	55.00	10	25.0	25.0	95.0
	65.00	2	5.0	5.0	100.0
	Total	40	100.0	100.0	

Posttest Scores of the Experimental Group

In this study, the researcher also analyzed posttest data of the experimental and control group students. In the posttest, the experimental group students' highest score was 90 with the lowest one was 60. There was an improvement toward students' reading comprehension achievement. The mean score of the experimental group in the posttest was 75.25. In the posttest, the experimental group students could successfully completed the program, i.e., no more student got the scores lower than 50. All students (100%) could get scores higher than or equal to 50. Table 3 below presented the attainment.

Table 3.
Posttest Scores of the Experimental Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	60.00	1	2.5	2.5	2.5
	65.00	5	12.5	12.5	15.0
Mean : 75.25	70.00	5	12.5	12.5	27.5
Median : 75.00	75.00	15	37.5	37.5	65.0
Minimum : 60	80.00	9	22.5	22.5	87.5
Maximum : 90	85.00	4	10.0	10.0	97.5
	90.00	1	2.5	2.5	100.0
	Total	40	100.0	100.0	

Posttest Scores of the Control Group

In the same vein, control group students' data in the posttest were also calculated. It was denoted that the mean score was 61.8750 with the highest score was 75 and the lowest one was 45. In addition, it was notified that there were 39 students (97.5 %) who could gain higher than or equals to 50, whereas there was only one student (2.5%) got lower than 50. The data could be seen in the table following 4.

Table 4.
Posttest Scores of the Control Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	45.00	1	2.5	2.5	2.5
	55.00	11	27.5	27.5	30.0
Mean : 61.87	60.00	8	20.0	20.0	50.0
Median : 62.50	65.00	12	30.0	30.0	80.0
Minimum : 45	70.00	7	17.5	17.5	97.5
Maximum : 75	75.00	1	2.5	2.5	100.0
	Total	40	100.0	100.0	

Normality and Homogeneity Tests

After the data were collected, the researcher then measured normality and homogeneity of the data. It was gained that the sig. value of the experimental group 0.084 with Kolmogorov-Smirnov, while based on Shapiro-Wilk, it was 0.188. This sig. values were higher than 0.05. This means that the data of the experimental group were in normal distribution.

By similar token, when the data of the control group were analyzed, it was noted that the sig. value was 0.072 with Kolmogorov-Smirnov, while in relation to Shapiro-Wilk it was 0.068. These sig. values were also higher than 0.05. Thus, it could be confirmed firmly that the data of the two groups were in normal distribution. The detailed description could be viewed in table 5 below.

Table 5
Test of Normality

Group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Experimental	.131	40	.084	.961	40	.188
Control	.133	40	.072	.949	40	.068
a. Lilliefors Significance Correction						

Furthermore, when the data were further analyzed for homogeneity, it was found that the sig. values based on mean was 0.894 and based on median was 0.911. Since the sig. values were higher than 0.05, it was grasped that the data were homogenous in variances. Table 6 below portrays the detailed of the data.

Table 6.
Test of Homogeneity of Variance

	Levene Statistic	df1	df2	Sig.
Based on Mean	.018	1	78	.894
Based on Median	.013	1	78	.911
Based on Median and with adjusted df	.013	1	77.728	.911
Based on trimmed mean	.020	1	78	.887

Pair Samples t-Test of the Experimental Group

Considering the data were in normal distribution and homogenous variances, the researcher further analyzed the data gained in inferential statistics. The researcher then analyzed for the improvement in every group from the pretest and posttest scores. It was noted that the sig. value was 0.000 which was lower than the sig. value 0.005 with *t*-obtained was 44.411. This could be expressed that there was a significant improvement of students' reading comprehension achievement after being instructed with Schoology improvement. The data could be viewed in the following table 7.

Table 7
Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Dev.	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
P a i r 1	Posttest – Pretest	37.250	5.304	.839	35.553	38.946	44.41	39	.000

Pair Samples t-Test of Control Group

In similar tone, when the data of the control group in the two tests were analyzed, the *t*-obtained was 9.760 with the sig. value 0.000. This was also lower than the sig. value 0.000. This can be stated that there was also an improvement in students' reading comprehension after being guided with conventional learning mode. Table 8 below depicted that data.

Table 8
Paired Samples t-Test of the Control Group

		Paired Differences					**t**	**df**	**Sig. (2-tailed)**
		Mean	Std. Dev.	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
P a i r 1	Posttest – Pretest	14.000	9.072	1.434	11.098	16.901	9.76	39	.000

Independent Samples t-Test

Considering the improvement of the two groups, the researchers then compared the achievement of the two groups to figure out which group could get better achievement. By integrating independent t-test, it was noted that the *t*-obtained was 9.22 with the sig. value was 0.000. It was lower than 0.005. By this condition, it could be declared that there was a significant difference of reading comprehension achievement between the two group students. This could be sum up that experimental group student who were treated with Schoology LMS in their reading comprehension instruction could get better achievement comparing to control group which was trained with conventional learning mode. The data could be observed in table 9 below.

Table 9
Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.	95% Confidence Interval of the Difference		
									Lower	Upper	
Post test	Equal variances assumed	.395	.532	9.22	78	.000	13.38	1.45	10.49	16.26	
	Equal variances not assumed			9.22	77.9	.000	13.38	1.45	10.49	16.26	

Discussion

There are several precious points discussed in this section, i.e., pretest and posttest results of the two groups, and independent t-tests. First, it is likely to notify that in the preliminary assessment, both group students' scores were not alike. Almost all experimental group students got low scores in the pretest, while half of control group students could gain better results. Moreover, the mean score of the experimental group was lower than that in the control group. This could be denoted that the two groups had different prior knowledge or reading comprehension ability.

Second, the two groups learning progress, i.e., control and experimental, promoted significant difference toward reading comprehension achievement. Learning progress of the control group, i.e., treated with conventional mode of learning, could not be optimally explored. It was true that they also got the improvement but this was not significant because there were quite many students still could not elevate their reading comprehension achievement. This phenomenon was contradictory with the experimental group students. They were treated several meetings with Schoology LMS and could gain much better improvement on their reading comprehension. This could be seen from their reading comprehension achievement which portrayed the significant improvement of students' reading comprehension. It is trustworthy to claim that the experimental group students became more motivated and fascinated in their learning. They were allowed to explore their reading competence and directed to be autonomous learners. Besides, they were also allowed to discuss their ideas with other students and could explore more extensive reading materials that endorsed them to have more reading comprehension. This is relevant to what noted scholars (Sanchez Garcia et al., 2018) have argued. Students who are instructed by using Schoology LMS can get better achievement than those who are trained in a traditional way.

Third, after grasping the ideas of students' learning progress of the two groups, the researcher could also inform the results of the normality and homogeneity tests. Both groups in the normality test informed that they were statistically in normal distribution due to the sig. value were higher than the standard value as indicated in Kolmogorov-Smirnov and Shapiro-Wilk. In addition, the data of homogeneity test promoted that the two groups were homogeneous in variance. This sig values based on mean, median, and median with adjusted df were higher than instructed by standard sig. value. In a nutshell, it could be stated that the data gained from the two groups were clustered as in normal distribution and homogenous in variance.

Fourth, the results of independent t-test promoted clear description on how Schoology has significantly influence experimental group students' reading comprehension progress comparing to conventional learning mode. It was found out that the F-obtained was 0.395 with sig. value 0.532. In addition, t-obtained was 9.22 with sig. value 0.000 for 2-tailed. Students who were treated with Schoology LMS as clustered in the experimental group could gain better mean scores of reading comprehension progress comparing to those who were instructed with the conventional mode of instruction. This ascertains that there is a significant influence of Schoology LMS for experimental group students comparing to the control one. The existence of Schoology LMS as the means of reading comprehension instruction brought positive influence toward students' reading progress, whereas those who were directed with conventional one could not optimally gain better achievement. In a nutshell, Schoology LMS integration could elevate students' reading comprehension achievement better than any other learning mode or means. As previously described in the introduction section of this paper that the integration of LMS ideally could promote better learning improvement is truly occurred. What reputable scholars (Abdellah, 2016; Essel, 2018; Ferdianto & Dwiniasih 2019) have previous informed related to LMS employment is totally correct. The integration of LMS in

learning process can promote valuable learning process that can come to precious learning output and outcome.

CONCLUSION

Some remarkable notes could be claimed: (1) control group student-teachers who were taught by using conventional mode of learning got improvement related to their reading comprehension. However, this improvement was not really significant; (2) experimental group student-teachers who were taught by using *Schoology* LMS got significant improvement related to their reading comprehension achievement; and (3) experimental and control group student-teachers made significant difference related to their reading comprehension achievements due to their mode of instructions. The experimental group students could get better scores than that of the control group students. In addition, mean scores of the final test of the experimental and control groups make any differences. Experimental group students can get much better results comparing to control group students. This means that Schoology LMS integration is more effective in increasing students' reading comprehension achievement.

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