Digital Tools in Teaching Clinical Language and Documentation Skills: An Evidence-Based Perspective

Dr. Rajiv Menon[1]*, Dr. Priya Nair[1], Dr. Karthik Iyer[2]
[1]Department of Medical Education, All India Institute of Medical Sciences (AIIMS), New Delhi, India
[2]Department of Clinical Training, Apollo Hospitals, Chennai, India

Abstract:
This study compares the results among the use of traditional approach, technology-enhanced teaching and student-centered strategy for directing the first-year Diploma 3 of Informatics Engineering students to improve their fundamental English grammar. The study aims to examine the teaching method which tends to impact best on the students' grammar knowledge and skills. The participants were 122 first-year Diploma 3 of Informatics Engineering class of 2015, 2016, and 2017. The study was conducted using Mettetal's Classroom Action Research. The data gathered were quantitative and qualitative. Quantitative data describing the result of each method were based on the students' final grade on the grammar class. The data were tested by using non-Parametric Kruskall Wallis test and Post Hoc Mann Whitney U test. Qualitative data to analyze the aspects causing the results were derived from the class observations of the teaching team and students' feedback. The study revealed that students taught in technology-enhanced environment improved their grammar skills and knowledge only slightly better than those taught by traditional approach, and the result of using technology-enhanced teaching was even far below than that of the students taught by student-centered method with only sufficient technology use. Students' low motivation to do drills at will, the complexity of evaluation tests, and the lecturer's fair pedagogy skills were the reasons behind the unsatisfactory outcomes of technology-enhanced teaching. The study contributes to show a lecturer's pedagogic skill especially for motivating students in cognitive learning engagement matters more than technology dependence in English grammar class.

Keyword: fundamental grammar, traditional, technology-enhanced teaching, student-centered, score

INTRODUCTION

Many education reformers insist that teachers use computer technology and digital media to help enhance their students' knowledge and skills since the tools help improve

knowledge and skills acquisition. Technology has been agreed to be an important part of current efforts in personalizing education. It is essential for students to learn with and about technology to gain good competencies the 21st century workforce and society (Moeller & Reitzes, 2011).

Students as the teaching clients have transformed into digital natives or the "native speakers" of the digital language of computers, video games and the Internet. Digital natives represent those growing up with technology, spending their entire lives surrounded by computers, videogames, digital music players, video cams, cell phones, and all other toys and tools of the digital age. The average college graduates, over their lives, spent over 10,000 hours playing video games and 20,000 hours watching TV much less than 5,000 hours reading. Computer games, email, the Internet, cell phones and instant messaging are integral parts of their lives (Prensky, 2001).

The finding was backed up by a survey indicating how pervasive technology has been among young people in everyday life. Online learning is one of the most rapidly growing trends in educational uses of digital technologies. For instance, the survey quotes Sloan Consortium estimating that 700,000 K–12 public school students took online courses in 2005–2006, and more than a million students did so in 2007–2008: a 43% increase in just two years. By the 2006–2007 academic year, 61% of higher education institutions in the U.S.A. offered online courses. In fall 2008, over 4.6 million students-over one quarter of all U.S.A higher education students-were taking at least one online course. Considering other fields of education, in the corporate world, according to a report by the American Society for Training and Development, about 33% of training was delivered electronically in 2007; nearly triple the rate in 2000. It can be seen that the increasing implementation of online learning indicating the dominance of technology use for education students is obvious (Vymetalkova & Milkova, 2019).

However, such positive impacts of technology-enhanced teaching method seemed to fail at the grammar learning result of Informatics Engineering (IE) Diploma 3 students class 2015-2017 at an IT university in a remote area. Class of 2015 were taught grammar by the method of traditional teaching (teacher-centered) blended with single learning source. Students' participation and technology use were minimum. They practiced the grammar theory and completed exercises selected by the lecturer. They were directed to learn more independently than collaboratively. The method resulted in only a sufficient impact on students' grammar knowledge and skills. In the following year, the same lecturer delivered the same grammar course by using technology-enhanced learning method to the students of 2016. Students still had to employ independent/individual learning strategy but used considerable amount of technology in their learning process, and so did the lecturer when teaching them. However, the students' grammar skills progressed only little. The subsequent year another lecturer assigned to teach class of 2017 using the similar syllabus created student-centered and collaborative learning class environment but incorporated minimum technology. In this class, students demonstrated much better performance than those of two previous classes.

Thus, the problems examined in this study were as follows:

1. Should Technology-Enhanced Teaching method remain to be given priority, although the minimum technology use in Traditional and Student-centered approaches was found to result almost nothing in students' fundamental English grammar knowledge and skills?
2. What aspects causing the ineffective teaching methods leading to a suggestion for the best fundamental English grammar teaching method?

The research objectives were:

1. to compare among the results of Technology-Enhanced Teaching, Traditional blended with single learning source and Student centered approach integrated with minimum technology use in teaching fundamental English grammar
2. to describe the aspects causing ineffective teaching methods.

Review of literature

The need for designing learning activities that include technology-enhanced gadgets instead of a mere introduction to ICT was proposed as it has been proven effective in EFL teaching and learning in early years′ settings. The learning targets can be easily reached by using technology as a tool and media competence as a trans-disciplinary objective. Indeed, she concludes highly technologically-mediated and literate teachers will be a basic skill in tomorrow's world (Acevedo & Gonzalez, 2016).

Ahmadi (2018) demonstrates learners should use technology to enhance their language skills as it has a crucial role in developing learners' creativity and provides them with interesting, enjoyable, and exciting alternatives to study the language. His literature review shows technology provides interaction between teachers and learners, comprehensible input and output, helps learners to develop thinking skills, makes learning and teaching becomes more student-centered, promotes learners' autonomy and helps them feel more confident, and increases learners' motivation to effectively learn a foreign language. Though his study indicates technology resources cannot guarantee teachers' teaching and learners' learning, he believes support and training for such teachers to integrate technology into language teaching will fix the problem.

Teachers should find ways to ensure successful technology integration beneficial to their students and then find resources that support learning. Their research shows teachers and learners obtain big advantages from a variety of language learning web sources to improve their learning experience, which was the reason why teachers should positively perceive the way of integrating technology into language teaching (Yesilel & Basak, 2016).

None of those studies examine the effect of technology-enhanced teaching method on English grammar and knowledge. The subjects of research on technology use in teaching and learning language have tended to be on speaking, listening, reading and sometimes writing. Research on the results of technology-enhanced teaching for English grammar whose characteristics are different from Reading, Listening and Speaking have been scarce. It has led to a reconsideration if technology use is compulsory in teaching all English skills.

Gamlo (2019) examined the influence of integrating *Learn English Grammar* application into the grammar lessons for preparatory-year students. The finding suggests that students employing the application in the classroom improve their grammar knowledge better than those taught by means of traditional instruction. However, technology use in teaching grammar is also recommended to be selective undertaken with full awareness of the learning objectives. It indicates the researcher's doubt that technology-enhanced teaching can be utterly effective in grammar learning process unless specific conditions supporting the technology-integrated teaching and learning environment are set.

Next, the study conducted by Vymetalkova and Milkova on the integration of digital technologies through a creation of a language laboratory MyEnglishLab shows high impact on reading and listening skills but produces. Nevertheless, it produced only minor effects on grammar despite the slight better result than that of drills (Vymetalkova & Milkova, 2019).

RESEARCH METHOD

Respondents

The respondents chosen on purpose were 122 Diploma 3 IE students already passing English entrance test held by the institution. The data were quantitative and qualitative. The quantitative data were the students' average total English grammar score, propotionately calculated from their average tasks scores, average quiz scores and mean exams values for 18 months, every odd semester of 2015 – 2017. The qualitative data providing the background for the students' results after taught using the three different methods were obtained from the lecturers' post evaluations on the learning behavior of their students and the students' feedback. Due to the syllabus, lecture materials and main handbook similarity during the period, the performance of classes taught by two different lecturers within the time became comparable.

Instruments

Classroom Action Research (CAR) method was used to conduct this study because the seven manageable steps of the method matched the research purpose seeking for a teaching pattern that could boost the student's best grammar performance based on their exam scores. Also, CAR concepts of gathering and analyzing the data could accommodate the process for understanding the aspects influencing the result(s) of a teaching method. As described in the reference, CAR is an observation method for what works best in a teacher's own classroom to improve the student learning (Mettal, 2003).

The validity was achieved through data triangulation. The focus was on the practical significance of findings rather than statistical or theoretical significance. The information collected consisted of background, quantitative and qualitative data.

Three types of data were collected; students' scores, teacher's evaluations and observations of students' behavior during learning process. The data were analyzed to look for findings with practical significance.

Procedures

Class Action Research stages were employed to conduct this study. The first stage was giving a pre-test for the students. The students' initial grammar skills were indicated from their English entrance test results, a TOEFL Test Prediction held by the institution, though the test was combined with Listening comprehension, Grammar and Reading Comprehension making it a mixed grammar pre-test.

The second stage called the Planning was the making of syllabus and the assigning of lecturers for the grammar class. The syllabus was entitled English 1 course. The learning objectives were mainly to make the students as the EFL learners knowledgeable in fundamental English grammar and skillful in its application through simple conversations and writings. The grammar topics were taken from one single source, Longman's Intermediate-to-Advanced Grammar Book published with separate key answers for self-study. Among the grammar topics were Articles, Nouns, Pronouns, Adjectives, Adverbs, Prepositions, Particles, Phrasal Verbs, Types of Sentences, Tenses, Question Forms and some other grammar topics. The reason for selecting the grammar book as the sole handbook was the exercises were many and various, ranked from individual pattern exercise to context based drills. Each student had to own the hard copy of the book for their independent study. The syllabus was developed by the teaching team and approved by the Teaching Coordinator as the reference for lecture and practicum series in classroom and self-study sessions. Students from classes of 2015-2016 were taught by the same lecturer, but class of 2017 was handled by another lecturer. The level of formal education, international English proficiency and general English teaching experience of both lecturers were relatively alike.

The third stage, the Action was the teaching and learning process in morning classrooms and independent-collaborative learning session on evenings. The morning schedule

was based on the institution's academic timetable, split into 50 minute theory and 100 minute practicum for 15 weeks. The independent-collaborative learning session was more flexible, but the students were expected to spend 2 hours on English reviews and tasks' completion every week. The maximum number of theory class was 50-60 students, while the practicum was limited to only 30 students to create more fruitful learning environment. The practicum class was never scheduled right after the theory class to keep with the students' concentration. The class was equipped by a whiteboard, markers and an eraser, an Instructor's PC, a projector and a slide, internet connection particularly access to the internal website cis.del.ac.id and Moodle system based e-course and electricity sources for plugging students' laptop batteries. Speakers were still portable, but they were available with previous notification to the technical support division. Each student had his or her own laptop. The lectures and exercises for practicum were submitted to the internal website at latest one day before the theory class for the students' perusal. Students could download and saved the materials in their laptop, but for complete feedback in grammar exercises selected by the lecturer, they had to read the Longman's grammar handout as the sole grammar theory source in the course.

There were variances in the teaching methods applied among students for class of 2015, 2016 and 2017. The class of 2015 was taught using Traditional method, which combined between the Teacher-centered and one single learning source titled Longman's Grammar book. Technology was used inconsiderably, just to ease the lecturer to upload materials for the students and deliver presentations in theory classes. Students were allowed to use their smartphones as the hand-held electronic dictionary to look up a word in class in classrooms. Students were required to have the copy of the handbook because they had to complete grammar exercises taken from the handbook as their weekly individual drills. The homework was done manually and submitted two or three days after the theory and practice classes related to the topics for the homework finished explaining by the lecturer. The exercises in the homework were mostly topic grammar problems, which were grammar questions by context.

The homework-based question typical were covered in their quizzes and exams. A session for questions and answers between students and lecturer was also allocated in each class. If it was insufficient, students were given two hours consultation outside regular class every week. The lecturer's aim of using Traditional method was to compel the students to review the grammar taught religiously so that they would be inevitably familiar with applying the grammar rules in spoken and written sentences properly. Next, the teaching method for the class of 2016 was enhanced by much technology by using free sources from the Internet to provide attractive grammar theories and exercises for students' class and independent learning. For example, rules related to Pronouns were taught through a song on Pronouns rules. The technology-enhanced method was also delivered by minimizing the lecturer's intervention. The students were introduced to Grammar Checker.com, a grammar checker application and suggested to use the grammar theory they were taught to revise sentence errors they made after having their writing checked. Sometimes, the students formed small groups comprising three or four students depending on the task complexity. They were asked to create role-plays employing the grammar topics and give brief presentations explaining their answers to grammar exercises, mostly by contexts. The texts used for practicing grammar by context or topic grammar were software engineering and IT selected by the lecturer from various latest popular scientific articles on the Internet. For the class of 2017 also sitting the same fundamental grammar course, the lecturer was replaced. On her written post evaluation, she reported she directed the students to understand the grammar topics by discussions.

The fourth stage was the lecturers' observing their classes, whereas the lecturer's performance was also observed by the students as the clients of teaching described in students'satisfactory questionnaire at the end of the grammar course. The fifth stage was tests for learning evaluation. The test instruments were two closed-book quizzes and two exams

consisting of a mid-term exam and a final exam designed by the lecturer. The quizzes and exams written based on the test blue prints were given every 7 weeks learning. The test blue prints for quizzes were designed by the PiC of target class alone, yet those for exams were discussed, reviewed and approved by other lecturers in the teaching team. The time for quizzes was 50 minutes with 25-30 questions and exams was 110 minutes with 50-60 questions each. The complexity of quizzes and exams were ranked into three levels with the score for each as follows: Easy with score 1, Medium with score 2, and Difficult with score 3. Each score represented the time a student should need to answer a question correctly. If there were context-based grammar problems, the number of words in the context was set from a range of minimum to maximum words. However, there were no rules on the minimum and maximum complexity level of the vocabulary as it was hard to find sources containing such contexts related to the learnt topic with the notes on vocabulary complexity. All tests had to be completed by the students individually using paper and pen in class. They were prohibited to use any dictionaries. The proctor for the quizzes was the lecturer herself, but the exams were supervised by the lecturers with the academic staffs.

The last stage was the reflection indicated by the lecturer's post evaluation after the course ended. The reflection after the end of each course was carried out by discussions between the lecturer and colleagues on the performance of the students concerning the teaching methods and learning strategies applied by the lecturer in her classes. The reflection stage was also about sharing teaching strategies among lecturers as professional feedback to improve each other's teaching method. It was the reason why the teaching method was modified despite the same syllabus and materials. The study was delivered according to the steps of CAR. The first stage was giving a pre-test for the students. The students were considered to have sit the pre-test through their English entrance test results called TOEFL Test Prediction held by the institution, though the test was combined with Listening comprehension, Grammar and Reading Comprehension making it a mixed grammar pre-test.

Data analysis

The quantitative data were analyzed and interpreted by using Descriptive analysis and non-parametric statistics test comprising the Kruskall Wallis test and its Post-Hoc test, the Mann Whitney U test (Hidayat, 2014). The average value was total average score for each class. The weight for each average score was 20% for assignments, 25% for quizzes, 25% for the mid exam and 30% for the final exam. The scoring was determined based on the Institution's grading system.

A non-parametric test was applied on processing the raw data to examine the effect of each teaching method on the students' fundamental grammar learning performance. The raw data consisted of the total average score of each student by class. Initially, so as to compare the effects among the three learning methods on students' grammar learning performance, a parametric test ANOVA was applied. Three conditions, Independency of Variables, Test of Normality, and Test of Homogenous must be met according to the statistics theory before the raw data could be processed using ANOVA test. The first two conditions were met, but the classes were found as non-homogenous. Thus, the ANOVA test was changed into a non-parametric test, the Kruskall Wallis test with its post hoc the Mann Whitney U test.

As the shape and data distribution among the three methods were different, the Kruskall Wallis and Post Hoc Mann Whitney U tests were employed to interpret the difference among the mean ranks of the three methods only.

Qualitative data were obtained from the lecturers' observations on students' learning attitudes in class, the lecturers' post evaluations and students' general feedback. The quantitative data were each class' average score. All of the data were analyzed to identify the primary causes for the unsatisfactory results of Technology-Enhanced Teaching use compared

to Student centered approach integrating only a little use of technology. It was also to figure out the insignificantly grammar performance of students taught by using Traditional method and those directed in Technology-Enhanced.

RESEARCH RESULTS AND DISCUSSION

1. Comparisons Among The Results of Traditional Method, Technology-Enhanced Teaching and Student-Centered on Students' Grammar Learning

Table 1 below shows the comparison of the final average scores and median values among three groups of Diploma 3 IE students each taught by using three different teaching methods, Traditional Method, Technology Enhanced Teaching, and Student-Centered with the first two groups were taught by the same lecturer, and the last group was taught by a different lecturer.

Table 1. Comparison among the Grammar Learning Performance of Diploma 3 of IE class of 2015-2017

Method	Median	Average	Stdev.	Max	Min	Grade
Traditional	52.50	49.68	6.39	69.14	38.91	C
Tech-enhanced	52.56	52.53	8.17	38.29	38.29	C
Student-centered	66.70	66.52	11.46	28.14	28.14	B

As described in the table, the students taught by using Student-centered method despite minimum technology use showed the best grammar learning performance illustrated from their final average score at 66.52 with the Median at 66.70. These average scores were categorized as B grade according to the standard of the Institution. In contrast, students taught the same fundamental grammar topics either by using Traditional method or Technology-Enhanced Teaching got lower average score and median value; respectively 49.68 and 52.53 for the average score, while for the median was 52.50 and 52.56. Such scores are categorized as C grade according to the Institution's grade standardization. Thus, the descriptive results indicate that Student-centered teaching is the best method to promote students' cognitive learning engagement in grammar teaching as it has allowed the learning targets to achieve fruitful results in their grammar tests. The scores also provide evidence that technology-enhanced teaching could be rather useless for encouraging the students to be skillful in grammar if other factors like the lecturer's pedagogy knowledge or technology pedagogy skill was neglected. The students' final average scores were also tested statistically using non- parametric tests, the Kruskall Wallis test and its post hoc test, the Mann Whitney U test. The test results were as follows in Table 2 -6.

Table 2. Kruskall-Wallis Test: Rank

	Method	N	Mean Rank
Grade	Traditional	31	38.65
	Technology-enhanced teaching	29	40.03
	Student-Centered integrated with min tech	62	82.97
	Total	122	

Test Statistics [a,b]

	Grade
Chi-Square	46.484
df	2
Asymp.Sig.	.000

a. Kruskall Wallis Test
b. Variable: Grouping Method

The Chi-Square test shows Asymp. Sig. or p-value lower than critical factor 0.05 verifying each of the teaching methods gave different effects on the students' final total average score after they were taught using the method. Table 3 on Kruskall Wallis Test shows Technology-Enhanced Teaching has resulted in students' mean grade rank at 40.03 much lower than the application of Student-Centered method integrated with minimum technology enabling the students to achieve the mean grade rank at 82.97, though such Technology-Enhanced Teaching could help the students achieve slightly better grammar learning performance than their seniors taught with Traditional method and got the mean grade rank at 38.65.

Table 4. Mann-Whitney U Test on Traditional and Technology Enhanced

	Method	N	Mean Rank	Sum of Ranks
Grade	Traditional	31	30.16	935.00
	Technology enhanced teaching	29	30.86	895.00
	Total	60		

Test Statistics [a]

	Grade
Mann Whitney U	439.000
Wilcoxon W	935.000
Z	-155
Asymp.Sig.	.877

a. Mann Whitney U test
b. Grouping Variable: Method

The Asymp. Sig. or p-value at 0. 877 higher than critical factor 0.05 resulted from the post hoc Kruskall Wallis, Mann Whitney U Test to Traditional and Technology-Enhanced Teaching means there was insignificant difference between the effect of Traditional method and Technology-Enhanced Teaching on the students' grammar learning performance represented by the almost similar mean grade ranks of both teaching methods, at 30.16 and 30. 86 respectively as is showed in Table 4.

Table 5. Mann-Whitney U Test on Traditional and Student-centered

	Method	N	Mean Rank	Sum of Ranks
Grade	Traditional	31	24.48	759.00
	Student-centered	62	58.62	3612.00
	Total	93		

Test Statistics [a]

	Grade
Mann Whitney U	263.000
Wilcoxon W	759.000
Z	-5.689
Asymp.Sig.	.000

a. Grouping Variable: Method

The Asymp. Sig. or p-value at 0.000 much lower than critical factor 0.05 represents a significantly different effect between Traditional method and Student-Centered method on the students' grammar improvement. It was also represented from the big gap between the mean grade ranks, respectively at 24.48 and 58.62, of both teaching methods in Table 5.

Table 6. Mann-Whitney U Test on Technology-Enhanced Teaching and Student-Centered

	Method	N	Mean Rank	Sum of Ranks
Grade	Technology enhanced teaching	29	24.17	701.00
	Student centered	62	56.21	3485.00
	Total	91		

Test Statistics [a]

	Grade
Mann Whitney U	266.000
Wilcoxon W	701.000
Z	-5.391
Asymp.Sig.	.000

Grouping Variable: Method

The Asymp. Sig. or p-value at 0.00, lower than critical factor 0.05 showing there was also a significant difference in the effect of Technology-Enhanced Teaching and Student-

centered represented from the major difference between the mean grade ranks of both teaching methods as can be seen from Table 6.

2. Aspects Influencing Results of Technology Enhanced Teaching and Traditional Method

One main factor for the slim rise of grades between Diploma 3 Informatics Engineering class of 2015 and class of 2016 was their reluctance to drill applying the grammar exercises at will. Self-drilling is essential for a learner weak in fundamental grammar proficiency. Actually, students understood most of the grammar topics because they managed to complete in-class exercises. However, they soon forgot the topic in the coming week as they skipped reviewing the learned topic. At the same time, the lecturer's time to mark more assignments for each student every week was limited, while more assignments usually helps improve the grammar weakness of an EFL student. Though they were given weekly homework to compel them to review the topics, they were often to get caught to have cheated their friends' work as the homework was completed without the lecturer's supervision.

In their feedback, class of 2015 also gave reasons they had negative perspective on studying grammar and refused to always do self-drills at will due to the boring and depressing teaching and learning methods. In that relation, the teaching method was altered from Traditional into Technology Enhanced Teaching integrated with multi learning sources and independent student-centered learning. The teaching environment was enhanced by using computer technology, like hardware, software, and the Internet to enhance the teaching and learning of languages by: a hand-held electronic dictionary to look up a word in class, reading e-articles, watching online English grammar tutorials, doing a computer-based language exercises displayed on the campus internal website that came with a textbook and other selected sources from the Internet, texting a classmate in English and discussing with the lecturer on the campus mailing list using English. Learning resources were more activity based than lecture-based, like role-play, mini drama, brief and formal presentations, retelling, and self-grammar exercises. Students were small-grouped and taught to practice grammar exercises collaboratively. They seemed to enjoy the learning process with more participation in class, though they were often hesitant to make presentations or role plays requiring them to speak in English before their classmates and the lecturer.

However, despite the teaching and learning method change, the total average score of the students was still below the BC grade target. Though the class of 2016 could increase their total average score higher than that of their seniors from class of 2015, the improvement was negligible since they were still at grade C based on the institution's standard. The students complained for the high complexity of the post-tests, two quizzes containing 30 questions each for 50 minutes and exams covering 100 questions each for 110 minutes. They grumbled with the difficult tests particularly in the parts demanding their analytical thinking by employing rules and concepts of grammar. In addition, students moaned they faced trouble to focus on practicing complex grammar questions in their independent study before the tests because at the same time they rushed the deadline of their many IT projects, related to their core subjects. Nevertheless, the lecturer observed that students of this class often procrastinated to review the topics taught and were reluctant to do extra non-marked exercises especially for topic grammar questions (grammar questions based on context) which required them to spare time to read articles and study the grammar of sentences in the articles. In fact, they protested to the lecturer about the high volume of grammar assignments despite the tasks' collaborative implementation.

Therefore, there were two factors influencing the ineffectiveness of Traditional method; the students' indolence for constant self-grammar practice outside classrooms and dull way of

teaching, while the unsuccessful result of Technology-Enhanced Teaching contrast to initially expected rooted from the complexity of tests, students' low ability to balance their independent study time when they had to comprehend complex English test materials at the same schedule they were to submit other projects irrelevant to English. The time management failure unavoidably was also due to their unwillingness to give extra efforts for practicing grammar from the beginning of the course, expressing their lack of motivation to be highly skilled in grammar.

The findings demonstrating the comparison between the grammar learning performance by teaching method lead to the solution for getting the teacher or lecturer equipped with pedagogy-based technology or technological pedagogy knowledge and skill professionally if technology-enhanced climate should be the main teaching strategy for ESL students to be knowledgeable and skillful in grammar. If technology-enhanced learning is challenging to create, it is better to employ mixed non-technology teaching method since pedagogy, particularly for motivating students seem to be the success key for teaching grammar.

DISCUSSIONS

The main result indicating the ineffectiveness of technology for teaching fundamental grammar has disavowed the propositions of experts quoted in the Review of Literature and Introduction on encouraging the unlikely undeniable technology use or integration in English skills learning and teaching process. In contrast to their findings, the Technology-Enhanced Teaching presented almost no improvement in students' grammar learning performance compared to Traditional Method. Indeed, Technology-Enhanced Teaching was surpassed by other teaching method that involved only sufficient technology use but stressed students' understanding through group discussions on grammar topics in classes.

As described in the Results, there has been a big gap between the mean grades ranks of the Technology-Enhanced Teaching and Student-centered. Such inadequate grammar learning performance matches the finding also displaying the only slight increase in the MyEnglishLab's users' grammar scores. Thus, the finding that Technology-Enhanced Teaching was futile for enabling the learners to acquire grammar skills supports some experts in education whose study outcomes on the technology integration or use in education sound pessimistic. Butler-Pascoe reported a survey that 42% of 109 TESOL MA programs did not utilize any computer technology, while only 18% offered a course in computer-assisted language learning (CALL). More recent data suggest only modest changes in the past decade (Butler & Pascoe, 1997). Then, Kessler (2018) found more than half had had no formal training with technology as part of their coursework, and more than three quarters felt their program had been helpless in preparing them to teach with technology.

However, the finding showing Technology-Enhanced Teaching has seemed to be hopeless for teaching grammar should be avoided due to the mixed aspects influencing the grammar learning results of the students taught by using the method, such as the lecturer's fair pedagogical skills to create learning engagement matching the students, the students' motivation to give extra effort due to other aspects like their non-English major causing the academic burden more relevant to their current field of study becoming time barrier for them to more focus on grammar drills, their prior grammar ability and grammar tests complexity. According to Bikowski (2018), technology can assist in grammar instruction in large classrooms or low resource environments; individualized instruction can be provided through group projects such as collaborative writing in synchronous or asynchronous Web-based environments (for example, Google Docs, PBWorks, or instant chat tools) or with customized feedback. Synchronous CMC projects pairing native and non-native speakers can aid learners in giving and applying feedback. Thus, as found by Al-Jarrah, Waan and Talafhah, the medium

or tool of Technology-Enhanced Teaching as a digital native approach to motivate EFL learners to acquire English grammar skills should be carefully chosen to be suitable for the lesson content, students' language and grade level (Al-Jarrah, Waan & Talafhah, 2019).

CONCLUSION

Though the target learning in the study were digital natives, the study proves the change of teaching pattern should not solely be based on employing or incorporating all kinds of technology but rooted from the skills and knowledge of selecting the technology combined with the knowledge of identifying the test complexity and the lecturer's skill to engage the students in the learning process so as to boost their learning motivation.

The result of Technology-Enhanced Teaching, proving it only a fair teaching method for grammar provides a finding that technology use should be appropriated and repurposed according to the characteristics of the context and the learning target. Despite strong support for technology use in education from most of educational reformists, the use of technology alone is unlikely to transform traditional learning environment into student-centered one, though it can support student-centered learning.

Therefore, although many educators encourage using and integrating technology in teaching and learning languages, the technology remains to be a tool which needs the user's technological pedagogy knowledge. Technology-pedagogy training is prerequisite for a teacher or a lecturer to expertly decide and design appropriate technology used or even integrated in a teaching process of an English topic or skill, especially for topics demanding the learner's tenacity such as applying the rules of the grammar in context.

ACKNOWLEDGMENT

Thanks to UPT Bahasa members for proof reading and feedback for the paper. I also would like to thank Ms Junita, a Mathematics lecturer for helping me understand with the quantitative data analysis method. Finally, thank you for Institut Teknologi Del (IT Del) for sponsoring this study.

BIBLIOGRAPHY

B. Moeller and T. Reitzes, "Integrating technology with student-centered learning", *NMEFDN*, July 2011. [Online]. Available: www.nmefdn.org (accessed on 26 May 2019)

D. Bikowski,"Technology for teaching grammar," *in The TESOL Encyclopedia of English Teaching View Projec*t., 2018. [Online]. Available: https://www.researchgate.net/publication/326689342 (accessed on 01 August 2019)

M. Prensky, "Digital Natives, Digital Immigrants, On the Horizon," University Press Vol. 9 No. 05, p. 5, October 2001

D. Vymetalkova and E. Milkova, "Experimental verfication of effectiveness of English language teaching using MyEnglishLab", *MDPI Sustainability*, 2019. [Online]. Available: www.mdpi.com/journal/sustainability (accessed on 31 October 2019)

Acevedo and N. Gonzalez, "Technology-enhanced gadgets in the teaching of English as a Foreign Language to very young learners ideas on implementation," pp. 510-512, October 2016.

M.R.Ahmadi,"The use of technology in English language learning: A literature review," *IJREE* vol.3 no. 2, p. 8, June 2018.

A. Yesilel and D. Basak,"Technology-enhanced language learning for digital natives," *PER Special Issue* 2016-IV, pp. 97-111, November 2016.

N. Gamlo,"The benefits of integrating the learn English grammar application into the Saudi EFL preintermediate prepatatory year classroom," *IJELE* vol. 7 no. 1, p.34, February 2019.

G. Mettetal,"Improving teaching through Classroom Action Research," *in Essays on Teaching Excellence Toward the Best in the Academy*, vol. 14 no. 7, 2003.

A. Hidayat,"Penjelasan dan Teori Uji Kruskal Wallis H", *SPSS Indonesia,* 16 Juli 2014. [Online]. Available: www.statiskian.com (accessed on 2 October 2019)

M.E. Butler-Pascoe, "Technology and second language learners: the Promise and the challenge ahead," *American Language Review*, 1997. [Online]. Available: https://www.researchgate.net/publication/234717909 (accessed on 28 October 2019)

G. Kessler, " Technology and the future of language teaching," *Foreign Language Annals*, 2018. [Online]. Available: https://www.researchgate.net/publication/323330702 (accessed on 28 October 2019)

T.M. Al-Jarrah, O.T. Waan, and R.H.Talafhah, "Improving English grammar achievement through educational games among eleventh grade students in East Jerusalem," *IJARPED* vol. 8, no. 1, pp. 75-86, March 2019.