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Bolstering Physics Students' Speaking Proficiency through Pecha Kucha Presentation Technique

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ABSTRACT

The study at hand endeavoured to find out whether or not there was any statistically significant difference in physics students' speaking proficiency after being instructed by implementing Pecha-Kucha Presentation Technique (PKP) and what speaking criteria were most enhanced. To answer the research question, the investigators applied a Pre-experimental Research Design. The subjects participated in this study consisted of thirty-four (N=34) students who were conveniently selected from a population of third-year students (N=65) in the Department of Physics, Tahri Mohamed University, Bechar, during the first semester of the academic year 2021/2022. To collect data, speaking assessment was conducted twice (pre-/ post-test) at the beginning and at the end of the experimental intervention during eight sessions of English for Physics (EP) course. Add to this, an attitude measure scale was administered to get in-depth insights about the participants' attitudes towards the implementation of PKP. Pair Samples T-Test was used to analyse the quantitative data via SPSS 26. Findings indicated that PKP had a positive effect on developing EP students' speaking ability because there was a statistically significant difference between the post-test and pre-test mean scores in favor of the post-test ($p= 0.00 < 0.05$). Moreover, the attitudinal questionnaire data revealed that the respondents had positive attitudes towards applying PKP in EP course. In plain terms, the alternative hypothesis of this study was accepted, whereas the null hypothesis was rejected. In light of the data analysis, PKP did enhance students' oral performance in terms of the five speaking criteria adapted from (Brown, 2004), namely pronunciation, vocabulary, accuracy, fluency, and comprehensibility.

Keywords: English as a Foreign Language, English for Specific Purposes, English for Physics, Pecha Kucha Presentation Technique, Physics students, Speaking Proficiency.

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Introduction:

In today's global village, English has become a bridge language through which people from diverse cultural backgrounds can interact and communicate with each other. It is conceived as a global language that achieves a genuinely international status which plays a key role that is recognized everywhere (Crystal, 2003). However, speaking English proficiently is an arduous task to fulfill for both EFL/ESP instructors and learners. Most of ESP students are not able to deliver coherent and comprehensible oral presentations, although they may spend seven years in learning English language. For O'Malley and Pierce, speaking English seems to be an important skill that a learner should acquire since one of the major roles assumed by EFL instructors is to help their learners to be able to communicate appropriately and effectively (O'Malley & Pierce, 1996). Thus, learners often evaluate their success in language learning on the basis of how well they feel they have improved in their spoken language proficiency (Richards, 2009). In a similar vein, Hammad and Abu Ghali (2015) maintain that EFL instructors can help students reinforce their speaking proficiency and reduce anxiety by means of employing certain pedagogical methods and techniques, such as oral presentations, role-plays, information gap, and classroom discussion (Hammad & Abu Ghali, 2015). Language educators had better look for innovative teaching techniques alongside learning strategies that enable their students to be proficient users of the lingua-franca, English, especially in today's globalization. For instance, oral presentations are believed to enable EFL students to practice pronunciation and accuracy, acquire vocabulary, develop fluency and attain comprehensibility. Oral presentations help students to learn from their peers and provide the opportunity to practice organizing material for public dissemination (Lazicki, Gaze, & Beyer, 2012). Recently, they play a key role in the business world; they are the daily rituals of the corporate and academic life (Souter, 2007).

Nowadays, the ultimate goal of English curriculum in most non-English speaking countries, including Algeria, is to enable students to communicate in English appropriately and effectively in authentic communicative situations. Thus, one of the useful techniques used to enhance their speaking proficiency and presentation skills, especially in ESP context, is Pecha-Kucha Presentation technology. Yet, there are a number of hindrances that impede ESP/EP learners to achieve a high level of speaking proficiency. To start with, scant lexical resource and grammatical accuracy hinder EP learners to communicate effectively in the target language. Add to this, lack of self-confidence, low self-esteem and motivation to deliver an oral presentation. Moreover, the paucity of ICTs, such as computer, language lab, English learning software, and projectors that can optimize students' learning activities. This empirical endeavor, therefore, focused on the use of Pecha-Kucha Presentation technology to bolster EP students' speaking ability and overcome the aforementioned impediments. Smith (2003) puts forward that Pecha Kuchas could be a powerful means of developing students' synthesis, summary, and time-keeping skills as well as adding excitement to presentations (Smith, 2013). Ergo, the core heart of the study at hand was the

establishment of a motivating learning atmosphere that would allow students to bolster their speaking proficiency by their own and hence fostering their learning autonomy to take charge of their own learning and take advantage of this technology in order to better their speaking performance.

Above all, this research is tow-fold: (1) measuring the effect of implementing PKP on enhancing Physics students' speaking proficiency; (2) getting in-depth insights about Physics students' attitudes towards using PKP in order to bolster their speaking proficiency and presentation skills. Thus, the current study addresses the following questions:

a. *Is there any statistically significant difference between speaking proficiency pretest and posttest scores of Physics students who undergone a kind of treatment through PKP?*
b. *What are EP students' attitudes towards using PKP in order to bolster their speaking proficiency and presentation skills?*

To answer the research questions, the following hypotheses are formulated as follows:

H0: There is no statistically significant difference between speaking proficiency pretest and posttest scores of Physics students who undergone a kind of treatment through PKP.

H1: There is a statistically significant difference between speaking proficiency pretest and posttest scores of Physics students who undergone a kind of treatment through PKP.

2. Literature Review

There is a plethora of studies in literature which are concerned with investigating the impact of integrating PKP into EFL/ESP context on improving students' speaking proficiency. For instance, Mazdayasna (2012) was among the earliest investigators who undertook a longitudinal observational study, including assessing five speaking performances for each EFL learner via delivering oral presentations. The results obtained from classroom observation and ANOVA indicated that the five speaking performances were significantly different (Mazdayasna, 2012). In a similar vein, Lazicki and Gaze (2012) conducted an empirical research, using between-subjects design, to compare between the usefulness of both PowerPoint presentation and Pecha-Kucha presentation. They found out that Pecha-Kucha Presentation is a worthwhile technique to use in EFL context. First, PKP helped EFL learners improve their time management skills. Additionally, it promotes their visual design literacy while building oral communication skills as well as increasing their motivation in the learning process (Lazicki, Gaze, & Beyer, 2012). Ryan (2012) also revealed that using PKP can help EFL students improve their pronunciation by enabling them to produce natural speech to keep up with the tempo of the presentation style (Ryan, 2012).

Another experiment carried out by Baskara (2015), in Indonesian context, to identify the impact of Pecha Kucha presentation on students' autonomy. The most significant findings reported that using PKP made EFL learners become more independent and active in English language learning and eventually enjoy the process (Baskara, 2015). Furthermore, Coskun (2017) conducted a pre-/post-test experimental research design to find out the effectiveness of PKP on decreasing students' English public speaking anxiety. According to the results, English public speaking anxiety was significantly reduced after being taught via PKP technique. Thus, it is recommended that this innovative instructional technique could be integrated in EFL context, especially for specific purposes to improve oral skills (Coskun, 2017). Likewise, Mabuan (2017) conducted a qualitative study to investigate students' perceptions and attitudes towards the use of PKPs in an ESL Public Speaking class. He concluded that PKPs helped ESL/EFL learners develop their English speaking and oral presentation skills and fostering their self-confidence in delivering oral presentations in front of the audience (Mabuan, 2017). The above findings corroborate with the results of other studies, such as (Zharkynbekova, Zhussupova, & Suleimenova, 2017) who found that PKP significantly improves ESP students' speaking skill much more than the traditional methods. PKP as a learning tool can engage students in the practical environment via hands-on experience learning instead of rote learning. Based on the main findings of their empirical study in investigating the peculiarities of PKP and proving its effectiveness in ESP course, they recommended that PKP is an essential technological tool that should be integrated in ESP/EFL setting.

Add to this, Arniatika (2018) implemented a classroom action research to improve EFL speaking performance through PKP method. The results showed that PKP is an effective and alternative way to teach speaking skill as it involves students actively in the learning process (Arniatika, 2018). Moreover, Angelina (2019) concluded that using PKP increased EFL students' speaking skill in delivering effective presentations in terms of language use, speech delivery and interaction with audience, including eye-contact and building rapport with their peers (Angelina, 2019). Solmaz (2019) also carried out a qualitative research in Turkish context. Thematic data analysis of open-ended survey and focus group interviews illustrated invaluable merits of using PKP, including enhancement of speaking and other linguistic skills, self-confidence, time management and oral presentation skills. In addition, the findings revealed that EFL teachers highly recognized the beneficial value of PKP and reported their intention to integrate it into their future language teaching pedagogies (Solmaz, 2019).

Another action research was conducted by Rokhaniyah (2019) to explore the effect of PKP on EFL learners' speaking fluency. The results indicated that PKP optimized EFL learners' speaking fluency, including improving the speed of learners' speech and words per minute; increasing articulation rate; strengthening phonation time ratio; reducing the frequency of silent pause; avoiding filler words; and decreasing disfluency in spontaneous speech (Rokhaniyah, 2019). Hammad (2020) also

conducted an empirical study to examine the impact of oral presentations on EFL students' speaking performance. He found that using oral presentations method had a positive effect on the participants' performance in the speaking test. Moreover, the open-ended questionnaire data showed that the respondents had positive attitudes toward employing oral presentations in EFL classroom (Hammad E. A., 2020). Another experimental research conducted by Falyanti (2021) to investigate whether there is a significant influence of using PKP on promoting students' speaking skill. It was found that the use of PKP technique is effective to increase the students' speaking skill (Faliyanti, 2021).

In light of the previous studies, it is noteworthy that none of the empirical studies conducted in the Algerian EFL context examined the effect of PKP technique on enhancing EP students' speaking proficiency. Therefore, the study under scrutiny endeavored to fill in this gap by investigating whether or not there was a statistically significant difference after implementing PKPs to teach speaking skill. Accordingly, the current study was primarily concerned with the integration of PKP into EP setting to enhance students' speaking performance and oral presentation competencies. Furthermore, it also investigated students' attitudes towards using this technique as an innovative and alternative approach to teaching EP course. The findings of this study are expected to get in-depth insights about using PKP technique so as to upgrade ESP students' speaking skill and give practical know-how for ESP instructors interested in this field in Algerian universities. Therefore, it is assumed that PKPs can develop Physics students' speaking proficiency.

2.1. Speaking Proficiency

Speaking, by definition, is the act of communicating ideas through speech and effective discussion, and it requires focusing on the topic, listening carefully, participating as a speaker and as a listener, and providing opinions (Bygate, 1987). Brown (2001) also defines speaking as an interactive process of constructing meaning, involving producing, receiving, and processing information. Its form and meaning are dependent on the context in which it takes place, including the participants, their collective experiences, the physical environment, and the purpose of speaking. In other words, speaking is an interactive process of constructing meaning that involves producing, receiving, and processing information" (Richards & Renandya, 2002).

Speaking skill is perceived to be the core heart of language proficiency. For many EFL/ESP learners, speaking English proficiently is of due importance in today's global village. Nunan (1991) contends that learning to speak in a second or foreign language will be facilitated when learners are actively engaged in attempting to communicate. Speaking is closely related to self-realization; much of impression about people comes from what they say and how they say it. For that reason, the teaching of speaking should be able to give contribution to the improvement of students' abilities (Nunan, 1991). Apparently, learning to speak is a sophisticated

process not readily known to the learners; learners are not knowledgeable of the strategies they can use to develop their speaking ability. EFL learners have little opportunity to acquire the skills needed for organizing their ideas cohesively and coherently while speaking (Mazdayasna, 2012). They also need to be exposed to real life situations in which they receive comprehensible input in a low-anxiety classroom environment. One of the reasons why speaking considered to be challenging is that the students are often reluctant to speak because they feel shy and are not predisposed to express their ideas in front of their peers. As a matter of fact, most of them are deprived from being exposed to authentic English language and can only use it in artificial setting, while outside the classroom they use their mother tongue. These hindrances make speaking proficiency elusive. Likewise, Celce Murcia (2001) maintains that teaching speaking is an activity that includes a number of subsystems and all these factors combine to make speaking a second or foreign language a formidable task for language learners. The students learn how to speak in the second language by interacting and also taking collaborative learning based on real-life situations that require communication. ESL teachers should create a classroom environment where students have authentic activities, real-life communication, and meaningful tasks that promote oral language for give the opportunity to the students for communicating in the target language (Celce-Murica, 2001). Ergo, the role of teacher during speaking activities is varied. They can be a prompter, a participant, or a feedback provider as suggested by Harmer (2007): as a prompter means that the teacher should provide assistance and guidance to scaffold their learning process; as a participant means that the teacher takes part in discussing the key points so far as the presentation is concerned; as a feedback provider means that the teacher directs students' speaking performance, whereas overcorrection may inhibit them and take the communicativeness out of the activity (Harmer, 2007).

2.2. Pecha Kucha Presentation Technique

Pecha-Kucha, chit-chat in Japanese, is an innovative and creative presentation software format. This technique requires oral presenters to deliver content in 20 slides, each automatically running for 20 seconds in a program like PowerPoint(Solmaz, 2019). PKP is basically a visual presentation as it emphasizes the use of photos, images or graphs, while the use of text is often limited, ensuring a brief and comprehensible delivery of content. It was designed so that it can effortlessly grab the audience's attention. PKP is also known as 20×20 presentation as the presenter may only use 20 slides, which automatically advance every 20 seconds. Thus, it lasts for exactly 6 minutes and 40 seconds. The time constraint impels the oral presenter to visually explain the ideas using graphics with little text on the slides and to carefully prepare their delivery. Stated differently, PKP style necessitates the presenters to employ fewer words and more relevant pictures and graphics that are pertinent to the topic. The slides are created using Microsoft PowerPoint applications. The focus of the presentation is on the visuals, not on slides full of text. Therefore, the presenter must be focused and have sufficient understanding of the topic. The short

presentation time provides the audience with the opportunity to discuss and interact with the oral presenter.

Using traditional PowerPoint presentations rather than producing obvious and pertinent data via PKPs often leads to distraction of attention and boredom. Indeed, most EFL/ESP students used to read aloud their PowerPoint text-heavy slides which are overloaded with irrelevant information and overrunning the allotted time, reflecting poor speaking proficiency. Consequently, relying on Microsoft Office PPT enfeebles the quality of students' presentations, e. g., not focusing on the main points, reading from wordy slides, and exceeding the allocated time (Murugaiah, 2016). As an alternative to the laborious regular presentations with text-heavy slides, Pecha Kucha technology has emerged as a result of the creative use of PowerPoint software. PKP is an alternative to long, wordy and boring PPTP often disusing images. This technique has become a widespread alternative for presenting assignments or projects in academia. It was introduced as part of a series of multimodal teaching methods designed to enhance critical problem-solving skills and encourage students to speak English spontaneously. The ultimate goal of the ESP course is to enable students to communicate appropriately and effectively in the target language. By so doing, PKP is then adopted as a novel teaching aid to enhance EP students' speaking competency in delivering coherent and understandable presentations. PKP can be a crucial teaching aid that must be integrated to teach English in the tertiary level.

Although PKP was firstly developed as a public speaking technique to capture architects' attention, its ubiquity extended beyond the realm of architecture and quickly spread to other disciplines as an innovative means of presentation (Tomset & Shaw, 2014). It has lately become ubiquitous in tertiary education in general and EFL context in particular due to its rigid structure and content flexibility. Pecha Kucha is a swift, time-constrained presentation technique that has already been used in EFL classrooms as a creative instructional technology to develop learners' oral presentations and public speaking competencies, diminish the pitfalls of conventional PPT presentation, and establish a learner-centered environment which is conducive to learner autonomy. PKP increases students' self-confidence for future presentations. It is also considered attractive, concise, faster, and most importantly minimizes the level of reliance on slides full of text. What is more, PKP time constraints can solve over-crowded classrooms as well as overloaded curricula. PKP can also be used in the classroom as a form of creative revision through which students help each other by expressing their personal perspectives and points of view about the researched data (Baskara, 2015).

Regardless of its shortcomings such as time restriction, advantages of PKP technique overtop its pitfalls. "One of the greatest advantages of PKP is that it is often very appealing, engaging and enjoyable to the audience" (Coskun, 2017). PKPs are clear, motivating and convincing presentations that really make the audience actively involved in negotiating meaning. The problem of most presenters is that they run over time, overload their slides with texts and data. Colombi (2017) puts forward that

"there is no reading from the slides permitted, so the oral presenter has to be more engaged in their presentation and engaging to their audience. As far as PKP merits are concerned, he further applied a case study to find out the benefits of using PKP. He found that 1) presentation time was considerably reduced compared to traditional PowerPoint presentations, allowing ten presentations to be delivered in one session; 2) students' attention levels were extremely high during their peers' presentations; 3) preparing and presenting for a PKP helped them attain brevity and conciseness, enabling them to deliver large amounts of information in a short amount of time (Colombi, 2017). By the same token, Solusia *et al.* (2019) conducted a descriptive qualitative study to obtain information about students' perceptions on PKP. They found that there are many beneficial outcomes as far as PKP is concerned. PKP encourages students to train and rehearse intensively before the actual presentation; the content is clear and straight to the point due to the limited time of PKPs; the audience pays more attentiveness with the 20 seconds per slide presentation; the presentation slides are more appealing since the use of sentences is very minimal with more graphic illustrations; PKP helps students focus only on the key points while untimed PowerPoint presentation sometimes allow them to talk out of the key points; and most importantly, PKP promotes discussion at the end of the presentation (Solusia, Kher, & Rani, 2019). In lucid terms, PKPs are more dynamic, attractive for audience, and well-prepared so that the presenters should be creative in terms of conveying the intended message.

3. Methodology

The study under scrutiny attempted to explore whether there is any statistically significant difference in EFL students' speaking proficiency after the implementation of the treatment through PKP technique adapted from (Brown, 2004). It was conducted by means of a Pre-experimental—One-group Pretest-Posttest Design—supported by a post-treatment questionnaire to get in-depth insights about physics students' attitudes towards the implementation of this technique. In this regard, Phakiti (2004) puts forward that "an experimental research design has been known to reside within a quantitative research methodology that is often adopted in language learning research" (Phakiti, 2014). The experimental intervention based on PKP technique was executed subsequent to the pre-test and prior to the post-test during eight weeks in which the participants were subjected to one-hour teaching per week.

For assessment purposes, the pre-test was administered to diagnose the students' current proficiency level, whereas the post-test was administered to measure the potential effect of the intervention, and hence comparing the difference of mean scores and finding out whether there is any substantial improvement in Physics students' oral production or not. Following a One-group Pretest-Posttest Design, the researchers elicited speech samples from "oral presentations" which they coded in terms of the five constructs, including fluency, vocabulary, accuracy, pronunciation and comprehensibility. The data were collected from October to December 2021.

3.1. Participants

Subjects (N=34) recruited in the concurrent experiment were third-year Physics students enrolled in the Department of Physics, Mohamed Tahri University, Bechar, during the first semester of the academic year 2021-2022. The participants were derived from the target population consisted of 65 physics students. The participants were of similar age, ranging from 19-22 years. They were all homogeneous in terms of ethnicity, mother tongue, exposure to English (7 years), and educational and cultural background.

3.2. Instruments

The instruments used by the researchers to gather quantitative data were speaking proficiency test adapted from (Brown, 2004), including pre-test and post-test, and a post-experiment attitudinal questionnaire. Proficiency tests are measures used by testers to quantify the candidate's mastery of the language in specific language uses (Norris, 2000). They intended to rate the subjects' speaking achievement prior to and after PKP technique was executed. The pre-test was used prior to the treatment to determine the strengths and weaknesses in the participants' knowledge and use of language (Alderson, 2006, p. 11). However, the post-test was used to conduct a comparative study after the treatment was implemented to find out whether there is any significance difference between pre- and post-test scores. Eventually, attitudinal scale questionnaire was employed for the purpose of measuring the participants' attitudes towards the experimental intervention via PKP technique.

3.3. Procedures

Physics-centered PKPs were performed during EP course, including topics such as the laws of planetary motion (Kepler Johannes); the law of gravity and calculus mathematics (Isaac Newton); the theory of electromagnetism (James Clerk Maxwell); the atomic nuclei and the quantum mechanics (Neils Bohr); the new quantum theory of physics and uncertainty principle (Werner Heisenberg); the theory of quantum electrodynamics (Richard Feynman); the laws of radioactive decay (Ernest Rutherford); special and general theory of relativity (Albert Einstein); and eventually the four laws of black hole mechanics (Stephen Hawking). Hence, the ultimate goal of this study was to enable Physics students to perform successful English oral presentations in terms of the five constructs of speaking proficiency in Physics-based topics. In the first session, students were made cognizant of the PKP technique and scoring rubric by which their speaking proficiency would be assessed throughout the EP course. They were provided with examples and explanations for guidance. The current study is a three-fold process, including *preparation*, *organization*, and *presentation* phase.

3.3.1. Preparation Phase:

First of all, students decided on which physics topic they are interested in with reference to the designed syllabus. After that, each student prepared his/her PKP based on the previously chosen topic. They were required to organize, explain, and illustrate the presented topic and following the teacher's instructions and guidelines.

3.3.2. Organisation Phase:

After preparing their PKPs, students should organize them in terms of both content and delivery of information. On the one hand, content should include a detailed introduction, a thorough explanation of the chosen physics phenomenon or physicist, an analysis of some key information using physics-based knowledge, and a brief conclusion of the main points that have been discussed earlier. On the other hand, delivery of information is concerned with using visual aids like PowerPoint, ICTs, respecting the allotted time.

3.3.3. Presentation Phase:

Each student would begin his/her PKP by giving an introduction. In the introduction part the student would talk about the major points of the topic. Then, he/she would give detailed information about the key terms which are concerned with the chosen topic. At last, they would conclude their PKPs. They were allowed to present orally for 6 minutes and 40 seconds. They received both teacher feedback and peer assessment. Participants' speaking performances were assessed via a marking grid adopted from (Brown, 2004) which includes five descriptors, namely pronunciation, vocabulary, accuracy, fluency, and comprehensibility. In order to make students interact with their peers after accomplishing PKPs, they were engaged in a follow up discussion pertaining to the presentation topic.

It is noteworthy that the instructor, in this EP course, was no longer a sage on the stage who pours knowledge into tabula rasa. However, he/she was a guide on the side, consultant, and facilitator of the learning process. As a guide, the teacher directed students' actions towards the right path, gave guidelines on how to make Pecha Kuchas, and made them aware of the facilitative learning strategies. As a consultant and facilitator, the teacher provided students with guidance and feedback prior to, during and subsequent to their PKPs as well as scaffolding their learning process.

4. Results

4.1. Pre-/post-test

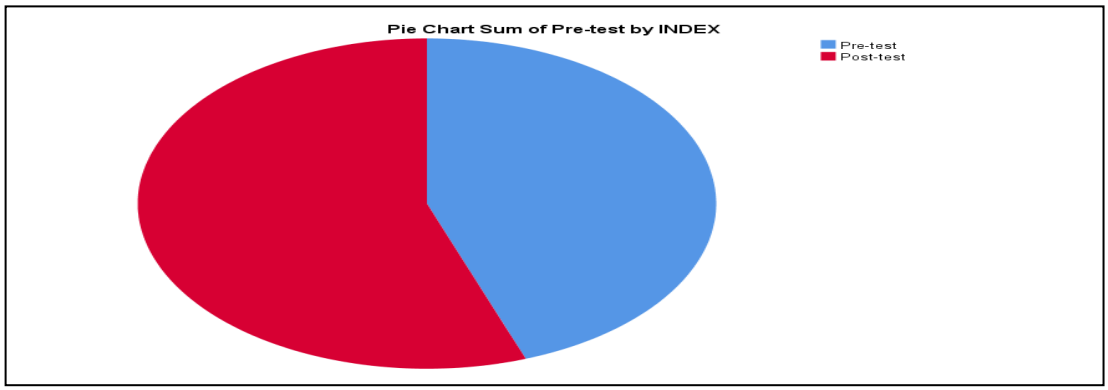
To investigate the effect of Pecha Kucha Presentation technique on physics students' speaking proficiency, descriptive statistics and inferential analysis were used to find out any significant difference in the pre-test and post-test scores. Means and Standard Deviations of pre- and post-test scores were compared. Additionally, Paired Samples T-Test table was employed to find out the statistically significant difference of students' speaking proficiency in pre-test and post-test which was analyzed and interpreted via SPSS. 26.0.

Table 1. Means and Std. Deviations of Students' Scores in the Pre- and Post-test

	N	Mean	Std. Deviation	Std. Error Mean
Pre-test	**34**	**47.35**	**14.832**	**2.544**
Post-test	**34**	**59.18**	**14.607**	**2.505**

According to Table 1, the mean score of pre-test is 47.35 and in the post-test is 59.18. The difference of mean score between pre-test and post-test is 11.83. The gap of mean score indicates the positive effect of PKP technique on Physics students' speaking proficiency after treatment. Standard deviation is a spread of values in the sample while standard error mean is an estimate of that standard deviation. So, the spread of values in the sample of pre- test was 14.832 while standard error of mean was 2.544. Moreover, the standard deviation and standard error for post- test were 14.607 and 2.505 respectively.

Fig 1. Students' Mean Score of Speaking Proficiency in the Pre- and Post-test



According to Figure 1, students' mean score in post-test was larger than their mean score in the pre-test. Thus, this research had positive result using "PKP Technique" for the betterment of physics students' speaking ability. It could be seen from the mean score in pre-test and post-test displayed in the pie chart above. In order to answer the research question, to what extent the implementation of PKP technique can affect EFL students' speaking proficiency in terms of pronunciation, vocabulary, accuracy, fluency and comprehensibility, Means and Standard Deviations of pre- and post-test scores were calculated and analyzed through SPSS version 26, using descriptive statistics as demonstrated in Table 2 below:

Table2. Descriptive Statistics of Students' Speaking Proficiency before and after Treatment in terms of the Five Constructs

Speaking Proficiency Indicators	Descriptive Statistics	Pretest	Posttest
Pronunciation	**Mean** **Std. Deviation** **Description**	**9.35** **3.845** **Fair**	**11.47** **3.369** **Good**
Vocabulary	**Mean** **Std. Deviation** **Description**	**9.53** **3.440** **Fair**	**12.59** **3.509** **Good**
Accuracy	**Mean** **Std. Deviation** **Description**	**9.44** **3.295** **Fair**	**10.59** **3.331** **Good**

Fluency	**Mean** **Std. Deviation** **Description**	**9.56** **2.721** **Fair**	**12.41** **2.872** **Good**
Comprehensibility	**Mean** **Std. Deviation** **Description**	**9.47** **2.501** **Fair**	**12.12** **2.739** **Good**

0-5: *Poor*; 6-9: *Fair*; 10-13: *Good*; 14-16; *Very Good*; 17-20: *Excellent*

From table 2, it can be seen that there were remarkable differences of students' mean scores in pre-test and post-test. The students' mean scores in post-test were larger than their mean scores in pretest. The students' pronunciation mean score in pretest achieved only (9.35), in vocabulary (9.53), in accuracy (9.44), in fluency (9.56) and in comprehensibility (9.47). However, in posttest the students achieved (11.47) in pronunciation, (12.59) in vocabulary, (10.59) in accuracy, (12.41) in fluency, and (12.12) in comprehensibility. It can be concluded that there was a substantial improvement of students' mean score from pre-test to post-test after learning speaking proficiency by using PKP technique, especially in vocabulary and fluency. Add to this, the next clustered bar chart demonstrates the comparison between the students' performance in five constructs of speaking proficiency at the beginning and at the end of the experimental intervention as follows:

Fig 2. Mean Scores of Pre-test and Post-test in terms of the Five Criteria

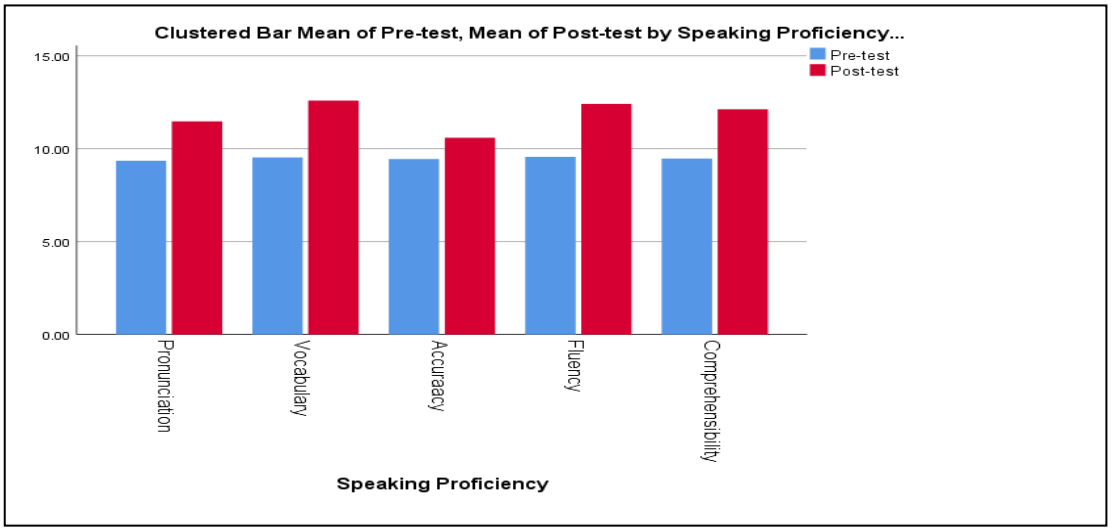


Figure 2 shows a substantial increase in students' speaking ability in terms of the five constructs, namely pronunciation, vocabulary, accuracy, fluency and comprehensibility after being taught through PKP Technique. Subsequently, to determine whether or not these differences are statistically significant, Paired-Samples T-Test was employed to find out significant differences of the five aspects of speaking proficiency, as illustrated in Table 3:

Table3. T-Test Results of the Five Speaking Proficiency Descriptors

Speaking Proficiency	T	Sig. (2-tailed)	(α)	Remarks
Pretest & Posttest (Pronunciation)	**12.250**	**.000**	**0.05**	**Significant Difference**
Pretest & Posttest (Vocabulary)	**20.140**	**.000**	**0.05**	**Significant Difference**
Pretest & Posttest (Accuracy)	**9.527**	**.000**	**0.05**	**Significant Difference**
Pretest & Posttest (Fluency)	**21.228**	**.000**	**0.05**	**Significant Difference**
Pretest & Posttest (Comprehensibility)	**15.259**	**.000**	**0.05**	**Significant Difference**

Table 3 indicates statistically significant differences (at $\alpha = 0.05$) between the mean scores on pre- and post-test in terms of speaking pronunciation, vocabulary, accuracy, fluency and comprehensibility, in favor of the post-test. Stated differently, the integration of Pecha Kucha Presentation Technique in English for Physics classroom could be efficient in terms of bolstering Physics students' speaking proficiency.

Table 4. Paired-Samples T-Test (Pre-test/ Post-test)

Paired Samples Test									
		Paired Differences					T	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Post-test - Pre-test	11.824	2.081	.357	11.097	12.550	33.126	33	.000

P < 0.05

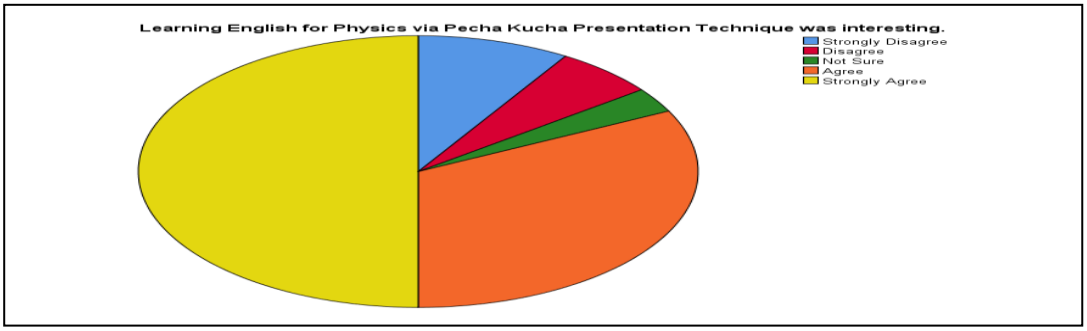
Based on the table 4 above, the results first attempted to explore whether or not there is statistically significant progress in Physics students' speaking proficiency,

i.e., the researchers compared the subjects' performance prior to and subsequent to the treatment. Table 4 displays the findings of comparing the students' speaking proficiency at the beginning of and at the end of the course. The Mean score of post-test (59.18) was larger than the mean score of the pretest (47.35). Accordingly, the Paired Samples T-Test found out that students in post-test performed significantly higher than the pre-test on the oral proficiency test ($t = 33.126$, $df = 33$, $p < .05$). Thus, results proved that there was a statistically significant difference between the mean scores of the study sample in the English for Physics speaking proficiency test in the pre-post assessment, in favor of the post-assessment. That is to say, the alternative hypothesis **(H1)** "there is a significant increase in the sample means of the pre- and post-test scores" was accepted, whereas the null hypothesis **(H0)** "there is no significant increase in the sample means of the pre- and post-test scores" was rejected. Thus, Pecha Kucha Presentation Technique was effective in increasing speaking proficiency in which the "t" value was significant at the level of (0.05).

4.2. Post-treatment Attitudinal Scale

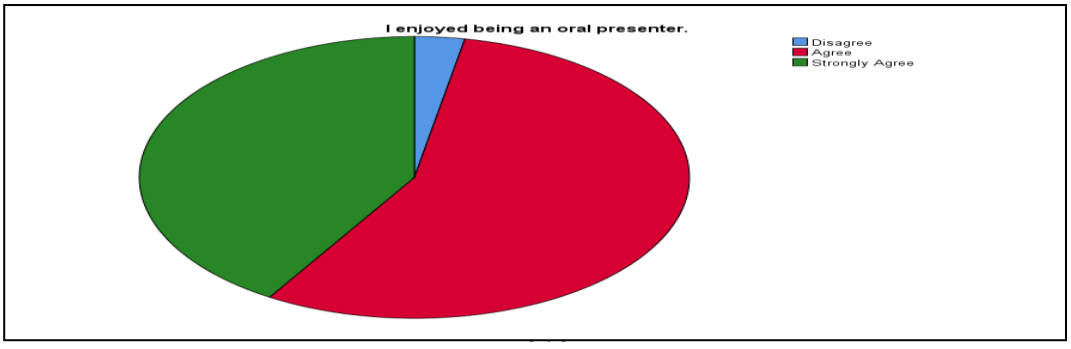
A post-treatment attitudinal scale was administered in order to assess the participants' opinions about using PKP in EP sessions to enhance their speaking proficiency. Their answers, of course, remained confidential for the purposes of the present study.

Fig 3. Learning English for Physics via Pecha Kucha Presentation Technique was interesting.



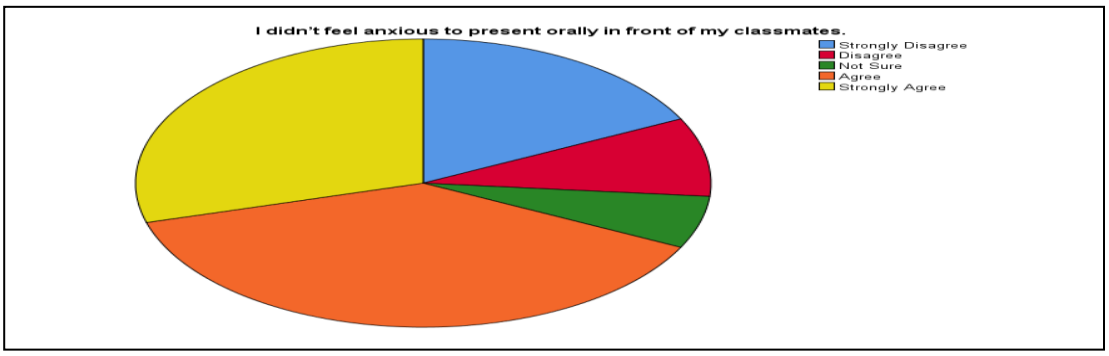
Based on figure 3, one can notice that most of the respondents acknowledge that learning English for physics via Pecha Kucha Presentation Technique was interesting (Strongly Agree= 50%; Agree= 32.4%). However, the rest of students disagree with the afore-mentioned statement, namely (Strongly Disagree= 8.8%; Disagree= 5.9%).

Fig 4. I enjoyed being an oral presenter.



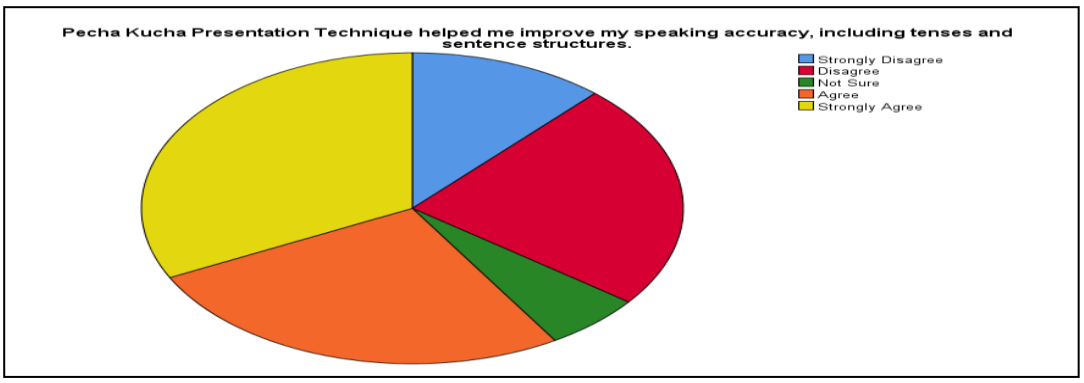
This statement intends to gauge the students' attitudes towards being enjoyed while presenting orally their reports. Accordingly, figure 4 indicates that 55.9% and 41.2% strongly agree and agree, respectively, that they enjoyed being an oral presenter during English for Physics course. However, only one participant (2.9%) disagrees with this technique.

Fig 5. I didn't feel anxious to present orally in front of my classmates.



Statement three has to do with physics students' anxiety when presenting orally in front of their classmates. Thus, figure 5 demonstrates that 67.7% (Strongly Agree= 29.4%; Agree= 38.3%) approve that they did not feel anxious to present orally in front of their classmates. However, 26.4% (Strongly Disagree= 17.6%; Disagree= 8.8%) disagree with item 3. That is to say, PKP reduced students' public speaking anxiety and strengthened their self-confidence.

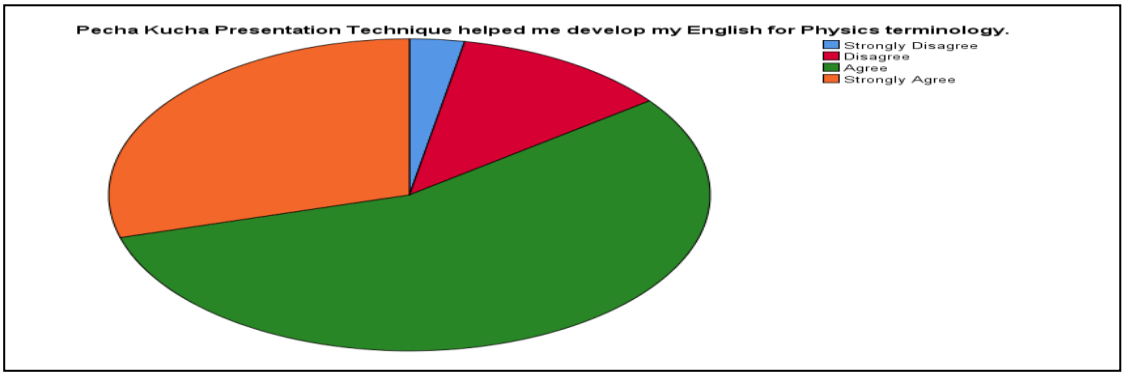
Fig 6. Pecha kucha Presentation Technique helped me improve my speaking accuracy, including tenses and sentence structures.



The main objective of this statement is to ascertain the pivotal role of using PKP in consolidating language usage amongst the participants. From figure 6, it can be noticed that 58.8% strongly agree and agree (Strongly Agree= 32.4%; Agree= 26.4%) with the fourth statement that Pecha Kucha Presentation technique helped the participants to enhance their speaking accuracy, namely tenses and sentence structures. On the other hand, 35.3% disagree and strongly disagree (Strongly

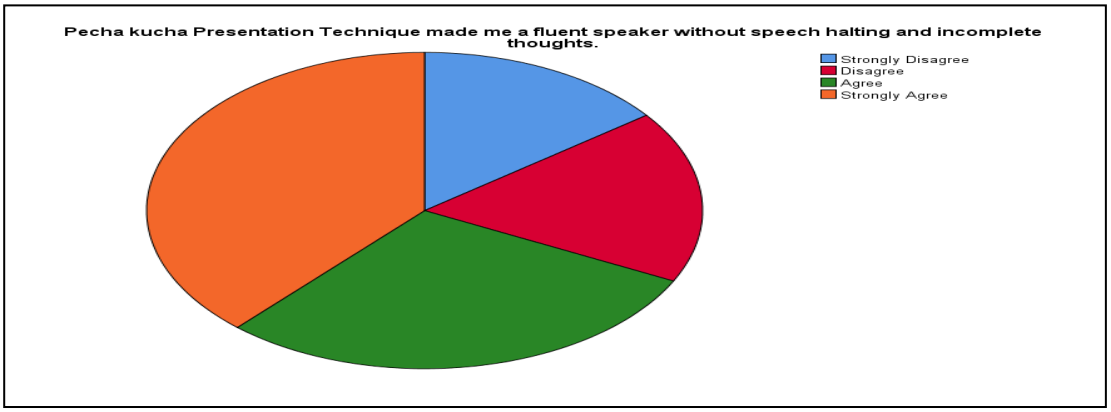
Disagree= 11.8%; Disagree= 23.5%) with item 4. The rest of the participants (N= 2) are not sure about their opinion as far as speaking accuracy is concerned.

Fig 7. Pecha Kucha Presentation Technique helped me develop my English for Physics terminology.



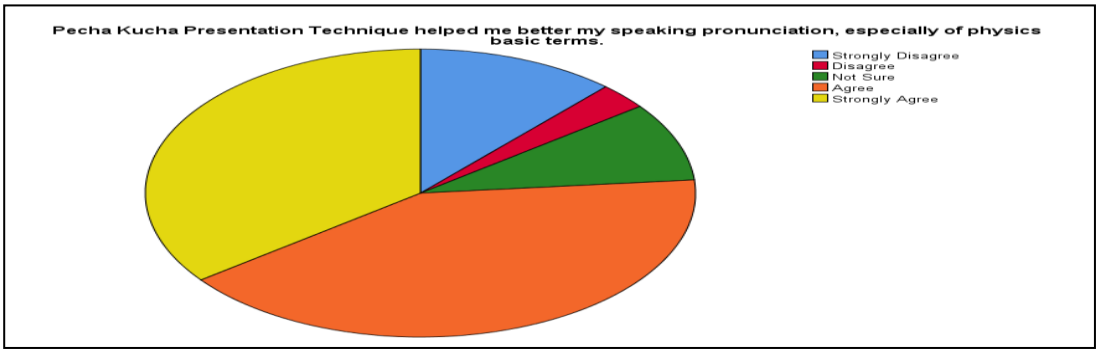
Item five seeks to measure the effect of PKP on students' speaking vocabulary. From this, figure 7 shows that the majority of participants (85.3%) agree (55.9%) and strongly agree (29.4%) that Pecha Kucha Presentation technique enhanced their speaking vocabulary, especially physics terminology. Yet, only 14.7% disagree (11.8%) and strongly disagree (2.9%) with that claim.

Fig 8. Pecha Kucha Presentation Technique made me a fluent speaker without speech halting and incomplete thoughts.



According to figure 8, most students (67.6%) strongly agree (38.3%) and agree (29.4%) that Pecha Kucha Presentation Technique made them fluent speakers without hesitation. Nevertheless, 32.3% disagree (17.6%) and strongly disagree (14.7%) with statement 6.

Fig 9. Pecha Kucha Presentation Technique helped me better my speaking pronunciation, especially of physics basic terms.



76.5 % of the respondents opted for "agree" (41.2%) and "strongly agree" (35.3%). They believe that Pecha Kucha Presentation technique really enhanced their speaking pronunciation. However, 14.7% of them disagree (2.9%) and strongly disagree (11.8%) with that claim. Only three students (8.8%) are not sure about the effectiveness of this technique in developing their pronunciation.

Fig 10. I could comprehend other speakers' intentions and respond to them appropriately, when delivering oral presentations.

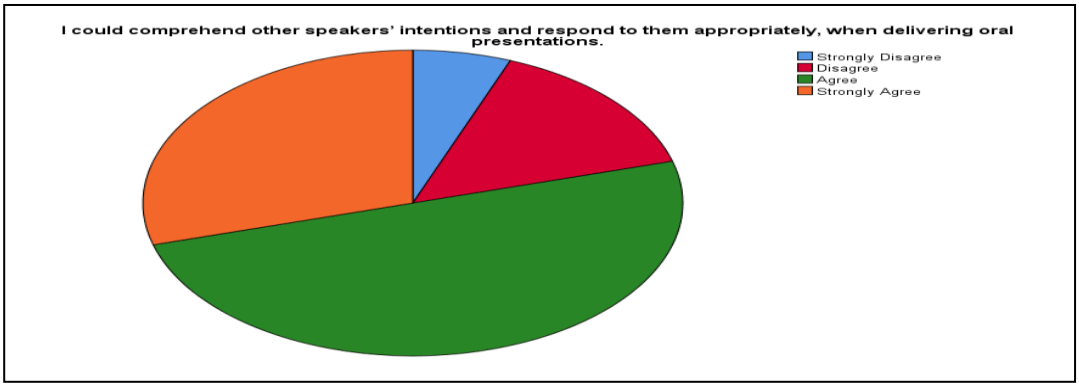
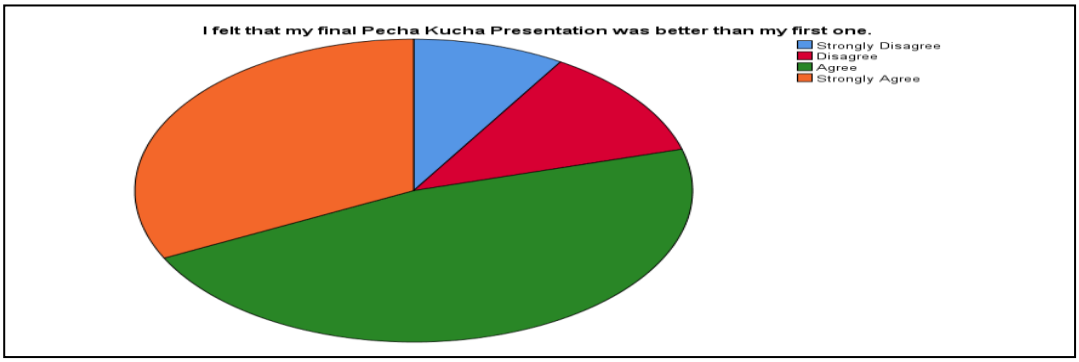


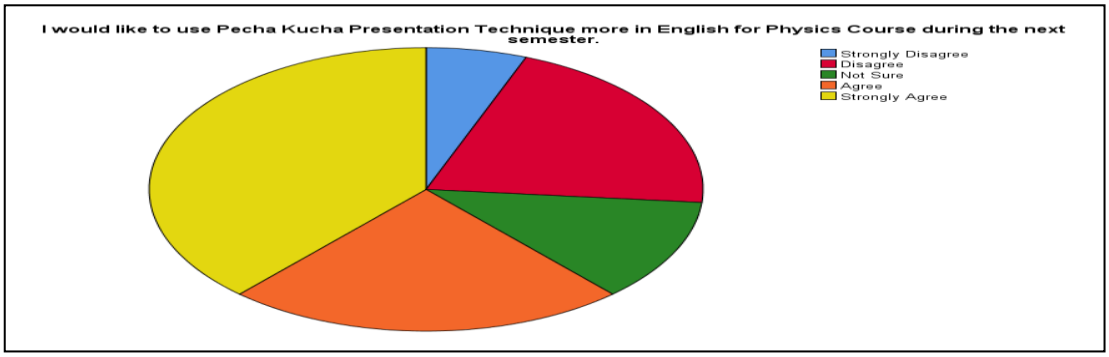
Figure 10 illustrates that 79.4% of the participants agree (50%) and strongly agree (29.4%) that Pecha Kucha Presentation technique improved their speaking comprehensibility. Howbeit, other respondents (20.6%) disagree (14.7%) and strongly disagree (5.9%) with item 8.

Fig 11. I felt that my final Pecha Kucha Presentation was better than my first one.



The favorite answers for this item are "agree" and "strongly agree" respectively. Figure 11 represents the percentages of respondents who agree (47%) and strongly agree (32.4%) that they felt their final Pecha Kucha Presentations were better than their first ones. On the other side, some others (Strongly Disagree= 8.8%; Disagree= 11.8%) do not agree with that statement.

Fig 12. I would like to use Pecha Kucha Presentation Technique more in English for Physics Course during the next semester.



Based on figure 12, it can be observed that 61.7% (Strongly Agree= 38.2%; Agree= 23.5%) of students taught through PKP approve that they would like to continue using that technique during the next semester because of its beneficial value. Yet, 26.5% of them (Disagree= 20.6%; Strongly Disagree= 5.9%) disagree with that statement. The rest (11.8%) are not sure whether they would like to study this way or not.

Table5. Results of the Attitudinal Scale (N= 34 students)

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

Items	1	2	3	4	5	Mean	Std. Deviation
Learning English for Physics via Pecha Kucha Presentation Technique was interesting.	3 8.8 % 	2 5.9 % 	1 2.9 % 	11 32.4 % 	17 50%	4.09	1.264
I enjoyed being an oral presenter.	0 0% 	1 2.9 % 	0 0% 	19 55.9 % 	14 41.2 % 	4.35	.646
I didn't feel anxious to present orally in front of my classmates.	6 17.6 % 	3 8.8 % 	2 5.9 % 	13 38.3 % 	10 29.4 % 	3.53	1.461
Pecha Kucha Presentation Technique helped me improve my speaking accuracy, including tenses and sentence structures.	4 11.8 % 	8 23.5 % 	2 5.9 % 	9 26.4 % 	11 32.4 % 	3.44	1.460
Pecha Kucha Presentation Technique helped me develop my English for Physics terminology.	1 2.9 % 	4 11.8 % 	0 0% 	19 55.9 % 	10 29.4 % 	3.97	1.029
Pecha Kucha Presentation Technique	5	6	0	10	13	3.59	1.520

made me a fluent speaker without speech halting and incomplete thoughts.	**14.7 %**	**17.6 %**	**0%**	**29.4 %**	**38.3**		
Pecha Kucha Presentation Technique helped me better my speaking pronunciation, especially of physics basic terms.	**4 11.8 %**	**1 2.9 %**	**3 8.8 %**	**14 41.2 %**	**12 35.3 %**	**3.85**	**1.282**
I could comprehend other speakers' intentions and respond to them appropriately, when delivering oral presentations.	**2 5.9 %**	**5 14.7 %**	**0 0%**	**17 50 %**	**10 29.4 %**	**3.82**	**1.193**
I felt that my final Pecha Kucha Presentation was better than my first one.	**3 8.8 %**	**4 11.8 %**	**0 0%**	**16 47 %**	**11 32.4 %**	**3.82**	**1.267**
I would like to use Pecha Kucha Presentation Technique more in English for Physics Course during the next semester.	**2 5.9 %**	**7 20.6 %**	**4 11.8 %**	**8 23.5 %**	**13 38.2 %**	**3.68**	**1.342**

From table 5 above, it can be obviously seen that the mean scores ranged from 3.44 to 4.35 on a five-point Likert-scale reveal that the participants have positive attitudes towards the empirical intervention, namely the implementation of Pecha Kucha Presentation Technique to enhance physics students' speaking proficiency.

5. Discussion and Recommendation

This paper intended to empirically assess the extent to which EP students' speaking proficiency can be enhanced via the implementation of PKP technology. To this end, the experiment was carried out so as to provide the subjects with an opportunity to perform orally in front of their peers as an endeavor to facilitate their learning process, and hence bolstering their speaking ability. Based on the findings of this investigation, PKP was found to offer invaluable results in terms of improving the EP students' oral output. In this context, Mabuan (2017) argues that incorporating PKP is of paramount significance for learners for boosting their English achievement in general and speaking skill in specific. Moreover, the findings of the study at hand are also in line with (Arniatika, 2018; Angelina, 2019; Solmaz, 2019; Rokhaniyah, 2019; Faliyanti, 2021) who examined the impact of PKP in developing learners' speaking skill. The Paired Samples T-Test results revealed that there was statistically significant increase in the students' mean scores of pre- and post-test in favor of the latter. This difference may be attributed to a different method used for teaching English for Physics; that is to say, subjects were undergone a kind of treatment via PKP. Accordingly, they apparently improved their speaking proficiency after being taught through implementing PKP. Furthermore, their scores in the post-test were statistically significant. Thus, the null hypothesis "there is no statistically significant difference between the mean scores of the pre- and post-test of the participants' speaking proficiency" at $\alpha \leq 0.05$ was rejected. And mainly, after analyzing the post-test mean scores of students' performance in each criterion of speaking proficiency, the investigator found out that their oral output was remarkably improved in terms of the five descriptors of speaking skill, especially vocabulary, fluency and comprehensibility.

6. Conclusion

At last, it can be concluded that attempting to improve Physics students' speaking proficiency through using PKP is a facilitative tool to bolster their oral skills in the Department of Physics, Tahri Mohamed University, Bechar, Algeria. It was proved by the gathered data that there was a statistically significant difference between the students' mean score of pretest and posttest. In pretest, the students' mean score is (M= 47.35) and the students' mean score in posttest is (M= 59.18). Moreover, the findings of Paired Samples T-Test in the pre-/post-assessment of EP students' speaking proficiency achievement was smaller than $\alpha = (0.00 < 0.05)$. Consequently, the alternative hypothesis "there are significant effects of PKP on the speaking proficiency of the third-year students in the Department of Physics, Bechar University" was accepted and null hypothesis was rejected. These findings answered the research question that the implementation of PKP in English for Physics course has a pivotal role in increasing EP students' speaking proficiency.

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8. Appendices

Appendix A: A Five-rating Scale Score Adapted from (Brown, 2004) for Assessing Speaking Proficiency: (Max = 100)

No	Category	Score	Descriptions
I.	**Pronunciation (Max = 20)**	**17-20** **14-16** **10-13** **6-9** **0-5**	- Clear pronunciation **(Excellent)** - Few inaccurate pronunciation **(Very Good)** - Inaccuracy of pronunciation does not seriously impede understanding **(Good)** - Inaccuracy of pronunciation impedes understanding **(Fair)** - Inaccuracy of pronunciation makes understanding almost impossible **(Poor)**
II.	**Vocabulary (Max = 20)**	**17-20** **14-16**	- Wholly appropriate **(Excellent)** - Few limitation **(Very Good)**

		10-13 **6-9** **0-5**	- Sometimes limited **(Good)** - Limitation affected the task **(Fair)** - Inadequate for the task **(Poor)**
III.	**Accuracy (Max = 20)**	**17-20** **14-16** **10-13** **6-9** **0-5**	- Clear and appropriate use of grammar **(Excellent)** - Few inaccurate grammar **(Very Good)** - Inaccuracy of grammar does not seriously impede understanding **(Good)** - Inaccuracy of grammar impedes understanding **(Fair)** - Inaccuracy of grammar makes understanding almost impossible **(Poor)**
IV.	**Fluency (Max = 20)**	**17-20** **14-16** **10-13** **6-9** **0-5**	- Fluent communication **(Excellent)** - Good communication **(Very Good)** - Rather good communication **(Good)** - Hesitant communication **(Fair)** - Minimal communication **(Poor)**
V.	**Comprehensibility (Max = 20)**	**17-20** **14-16** **10-13** **6-9** **0-5**	- Highly comprehensible **(Excellent)** - comprehensible **(Very Good)** - slightly comprehensible **(Good)** - Incomprehensible **(Fair)** - Totally incomprehensible **(Poor)**