ENHANCING SPEAKING SKILLS AND THE FOUR Cs THROUGH PROJECT-BASED LEARNING FOR THE ELECTRICAL ENGINEERING STUDENTS OF SULTAN AGUNG ISLAMIC UNIVERSITY IN THE ACADEMIC YEAR OF 2017/ 2018

THESIS

In Partial Fulfilment of the Requirements
for Master Degree in Linguistics

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A THESIS

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CERTIFICATION OF ORIGINALITY

I hereby declare that this study is own my own and that, to the best of my knowledge and belief, this study contains no material previously published or written by another or material which to a substantial extent has been accepted for the award of any other degree or diploma of a university or other institutes of higher learning, except where due acknowledgement is made in the text of the thesis.

Semarang, June 19th, 2019

Sintya Mutiara W. E.

MOTTO AND DEDICATION

MOTTO

Urip kuwi Urup.

(Javanese wisdom)

DEDICATION

I dedicate my thesis to:

- Myself for my patience, effort, and hard work
- My tough daughter, Kidung,
- My Mom and my younger brother,
- My best friends: Shirley, Lia, Okta, for always supporting and lending me a hand

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I realize that this thesis is still far from being perfect. Therefore, I would be glad to receive any constructive criticism and recommendation to make this thesis better.

Semarang, June 19th, 2019

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ABSTRACT

The rapid change of information and technology in the 21st century demands students to adapt. They are required not only to master English communication as an international language, but also to provide themselves with the essential skills of the era. Project-Based Learning (PjBL) is a challenging, interesting, and motivating method represented by end products. This study was aimed to investigate the effectiveness of PjBL to enhance speaking skills and promote the "Four Cs' (critical thinking and problem solving, communication, collaboration, and creativity and innovation) as the 21st century skills. Quantitative and qualitative research design was used in this study. Quasi experimental research was conducted to 53 students of electrical engineering Sultan Agung Islamic University. Speaking tests, observations, Likert scale questionnaires, and semi-structured interviews were employed as the instruments. The results showed that the experimental group consisting of 27 students experienced better improvement compared to the control group. The mean score of the experimental group was 15.32, while the mean score of the control group was 11.62. Furthermore, *Independent Sample T-test* showed sig. value (2 tailed) of 0.00, which was lower than 0.05, meaning that there was statistically significant difference between the two groups. From the results of questionnaires, most respondents strongly agreed that PjBL helped them speak more actively and encourage their higher-order thinking, interaction, teamwork, and creativity. The results of the interviews also indicated the students' positive perspectives towards the implementation of PjBL since they were excited and challenged during all the speaking project time. It can be concluded that PjBL proved effective to enhance the students' speaking skill and foster their "Four Cs". PjBL can be an alternative method for English teachers in teaching non-English students in the higher education level.

Key words: *speaking, the Four Cs, Project-Based Learning*

INTISARI

Perubahan informasi dan teknologi yang sangat cepat memberikan tantangan kepada siswa untuk mampu beadaptasi. Mereka tidak hanya dituntut untuk bisa berkomunikasi dalam bahasa Inggris sebagai bahasa international, tetapi juga diharuskan menguasai kemampuan-kemampuan yang penting dari abad ke-21. Pembelajaran Berbasis Proyek adalah sebuah metode yang menantang, menarik, dan memotivasi yang menghasilkan proyek akhir. Penelitian ini bertujuan untuk membuktikan keefektifitasan Pembelajaran Berbasis Proyek dalam meningkatkan 4Cs (berpikir kritis dan memecahkan masalah, komunikasi, kolaborasi, dan kreativitas dan inovasi) sebagai kemampuan-kemampuan abad ke-21 dan meningkatkan kemampuan berbicara bahasa Inggris melalui proyek-proyek berbicara. Penelitian menggunakan desain kuantitatif dan kualitatif. Penelitian kuasi eksperimen dilakukan terhadap 53 mahasiswa jurusan teknik elektro dari Universitas Islam Sultan Agung. Tes berbicara, pengamatan, kuesioner dengan skala *Likert* dan wawancara dilakukan sebagai instrument dalam penelitian ini. Hasil menunjukkan bahwa kelompok eksperimen yang terdiri dari 27 mahasiswa mengalami peningkatan yang lebih baik dibandingkan dengan kelompok control. Nilai rata-rata kelompok eksperimen adalah 15.32, sedangkan nilai rata-rata kelas control adalah 11.62. Lagipula, uji *Independent T-test* menunjukkan nilai *sig. (2 tailed)* sebesar 0,00 yang lebih kecil dari 0.05, yang berarti bahwa terdapat perbedaan yang signifikan secara statistik antara kedua kelompok. Berdasarkan hasil kuesioner, hampir semua responden sangat setuju bahwa PjBL membantu mereka berbicara lebih aktif dan mendorong *higher-order thinking*, interaksi, kerjasama tim, dan kreativitas mereka. Hasil wawancara pun menunjukan pandangan positif responden terhadap pelaksanaan Pembelajaran Berbasis Proyek karena mereka merasa senang dan tertantang selama waktu pengerjaan proyek berbicara. Hal ini dapat disimpulkan bahwa PjBL terbukti efectif meningkatkan kemampuan berbicara dan 4C mahasiswa. PjBL dapat menjadi metode alternatif bagi pengajar bahasa Inggris dalam mengajar mahasiswa bukan jurusan bahasa Inggris di tingkat perguruan tinggi.

Kata kunci: *berbicara, 4C, pembelajaran berbasis proyek*

CHAPTER I

INTRODUCTION

This chapter discusses the introduction of the study. It contains background of the study, statement of the problem, objective of the study, significance of the study, scope of the study, definition of key terms, and outline of the study.

1.1 Background of the Study

Developing speaking skill is vital for EFL and ESL. Nunan (1991) confims that success is determined by the ability of performing a conversation in the target language. It means that when somebody is able to create and engage the interlocutor with an interesting topic, then that is the moment the speaker is able to balance and impress the interlocutor. In its relationship with the global market, Pacific Policy Research Center (2010) states that much success of today depends on how good people are at communicating, sharing and applying information to overcome complex issues. Similarly, Pollack-Wahl (2000) states that speaking is one of the best career enhancers and one biggest factor in determining student's success or failure. For instance, in a career life, staff or workers definitely need to communicate to other parties to exchange ideas and share their plans. Staff or workers who possess good communication skills will automatically have more chances to meet national or international clients so that by having these skills they will have more opportunities to gain work experiences and get promotion from

their company. Meanwhile, in academic life, students can perform their work easier through class discussions, presentations, peer work, role-play, and some other activities if they are supported with good communication skills, especially English communication since it is one main language in most multinational companies. From the illustration, the role of speaking as a way of communication is inevitable for professionals in the career life and students at schools because it has a great influence on their future life.

Even though speaking is crucial to support current and future work, speaking is considered to be one biggest problem for language learners (Bueno, Madrid and McLaren, 2006:321). The education system which commonly uses lecturing style cannot encourage students to be active in English communication. The emphasis of writing, reading, or grammar in the classroom activity also reduces students' opportunity to practice their speaking skill. Besides, memorizing certain grammar rules while speaking is also one factor lowering students' willingness to speak up. This is in line with Bailey and Savage (1994:7) that a combination of many elements causes speaking a very heavy burden for the learners. In addition, there are some other psychological reasons affecting students' speaking performance, such as feeling anxious and shy, unconfident, unmotivated, and afraid of making mistakes, which are considered to be the factors that commonly impede students to use English in their learning activities (Burns and Joyce in Nunan (1999); Schwartz (2005); and Thornbury (2005). It can be inferred that learning speaking in English is still likely the hardest work for many Indonesian students.

Besides problems in mastering English speaking skills, students still have to compete with some challenges in the 21st century learning. To survive in the global economy market, they are required to equip themselves with high-quality skills. In this respect, Pacific Policy Research Center (2010) suggests that in order to comply with the challenges of the 21st century, there should be certain efforts to change schools to be a place that can create and guide students to gain creative thinking, problem-solving, collaborative, and innovative skills. Those skills have become nearly inevitability for all elements of workforce nowadays.

Related to this matter, it is necessary to educators to adjust the conventional education system using a pencil-paper method to the one which fits the demands of this era. Teacher-centered classrooms are said not to be the most proper method for developing the era's demands effectively (Cook and Weaving:2013). This is in line with Kwek (2011), in order to conquer the 21st century expectations, educators should shift the paradigm and explore new methods which can meet students' and the era's needs. This is basically done to answer questions of parents and students related to what the students in college learn and what the evidences are. The parents and students have apprehension about how they value the prospects of the undergraduates which have changed due to the increasing technology and the demands of knowledge and skills in most study fields.

Millions of education researchers and educators throughout the world have formulated particular concepts related to the skills mostly needed by students since 2002 (Trilling and Fadel:2009). One of them emanates from the National

Education Association (NEA). Dennis Van Roekel, the president of NEA, proposes the four main skills mostly needed in the era. It is the "Four Cs", which stands for critical thinking and problem solving, communication, collaboration, and creativity and innovation (NEA:2010). John Stocks, serving as the executive director of NEA, shares his idea about the importance of the Four Cs. He affirms that the implementation of the Four Cs in schools is strongly recommended. He urges that teaching the main courses must be accompanied by tasks and activities which can stimulate and encourage students to think critically, to communicate to peers by using the aimed language, to collaborate with other significant parties, and to create meaningful things.

A number of experiences in teaching students in some faculties and professionals in some corporations lead me to conduct research concerning with the importance of speaking skills and life skills. From the professional teaching experience, I learn how English competence is essential to support the professionals' career and they have realized it, but they are too busy to practise. While, from the college student teaching experience, I learn that English is basically essential for the students' school and future career, but unfortunately students are still not aware of it. These different concepts of English competence priority give me such a challenge. Furthermore, teaching English-department students differs from teaching non-English-department students. English-department students have a mindset that they will occupy a series of professions which deals with English, such as teachers or language experts so that intrinsic motivation has been instilled in their daily routines. On the other hand, non-

English-department students still need some enlightenment that English is as important as their core subjects.

In this research, I focus on the electrical engineering students of Sultan Agung Islamic University (UNISSULA). Electrical engineering is included in STEM (science, technology, engineering, and mathematics), the fields which produce huge impacts to human civilization through their products and innovations. The electrical engineering students of UNISSULA also have promising potential in winning some national and international robotic and electrical stuff competitions. These facts show that they are demanded to master integrated skills, such as English oral communication skills and the Four Cs which can facilitate and give meaningful contributions to global life.

However, the students of English classes in the electrical engineering major which are usually occupied by male students tend to be reserved. Gender issues seem to appear in this case. Marcus (1999) states that male students have some characteristics in learning. They are more kinesthetic, tactual, and visual. They are also fond of extra movements and tend to be more rebellious and peer-motivated than females. Those attributes cause them easily bored of lecturing classes. Moreover, the feeling of inferiority and lack of confidence make them choose to keep silent. In addition, the existence of English subject which is generally considered to be the secondary subject compared to the other electrical-related subjects, affects their motivation. Thus, it needs challenging activities to encourage the students' participation in the classroom through a flexible and

suitable teaching and learning method to integrate speaking skills and the 21st century skills demands.

Project-Based Learning (PjBL) has been one mostly-discussed teaching and learning method these years (Lam:2011). PjBL is viewed to give a solution to language classroom problems since it offers learner-centered education which allows students to interact more actively to their pairs, groups, and teachers in their process of learning (Stoller:2002). PjBL stimulates students by making them create end products in the form of products, presentations, or publications (Bell:2010). From the processes of product making, students are able to use, apply, and explore their targeted language and skills. Learning that this method is active and challenging, PjBL may answer gender-related issues in the classroom mentioned before. Therefore, I propose PjBL to test the hypotheses whether or not it can make the electrical engineering students more active in speaking English and involving the Four Cs in the project work.

1.2 Statement of the Problem

In regard to the background of the study, the research is to investigate the following questions:

a. How is Project-Based Learning effective to enhance speaking skills for the electrical engineering students of Sultan Agung Islamic University in the academic year of 2017/2018?
b. How is Project-Based Learning effective to develop the Four Cs (critical thinking and problem solving, communication, collaboration, and creativity and

innovation) for the electrical engineering students of Sultan Agung Islamic University in the academic year of 2017/2018?

1.3 Purposes of the Study

In regard to the problems mentioned earlier, the objectives of the study are:

a. to investigate the effectiveness of Project-Based Learning to improve speaking skills for the electrical engineering students of Sultan Agung Islamic University in the academic year of 2017/2018
b. to reveal the effectiveness of Project-Based Learning to develop the Four Cs (critical thinking and problem solving, communication, collaboration, and creativity and innovation) for the electrical engineering students of Sultan Agung Islamic University in the academic year of 2017/2018

1.4 Significance of the Study

This section elaborates contributions of this study: (1) theoretically - it highlights the development of teaching methods in the 21st century, especially in teaching English speaking skills, and practically (2) - this study can give benefits to EFL educators, especially in higher education, EFL learners, and the further researchers.

1.4.1 Theory

Theoretically, this study will enrich EFL educators, especially in college or university courses for the implementation of Project-Based Learning as one way for teaching English speaking in the 21st century. This study also introduces

Project-Based Learning as a medium to develop the Four Cs for the students. Furthermore, this study proposes one meaningful alternative for teaching English speaking for non-English students in higher education. The results of this study can also be taken as inputs and references for the further research in related to teaching English speaking and the required skills in the 21st century.

1.4.2 Practice

This study will give special contributions to teachers, learners, and the writer herself.

- For teachers (lecturers)

  The research provides EFL educators/ lecturers intellectual understanding and a sort of examples of the implementation of Project-Based Learning accompanied by theories, guidance, implementation, and results in English language teaching. It also offers experiences and problems encountered that may be different from the common experiences of English classroom activities. This study may also encourage English lecturers to apply the Project-Based Learning to teach English speaking skills.

- For learners

  This study may assist students in college or other higher education to enhance their speaking skills. Besides, this study can help them promote the crucial learning and innovation skills in this era.

- For the writer

This study is to share the writer's experiences and propose feedback so that this can develop the writer's skills and knowledge about methods in teaching EFL, especially in teaching speaking skills.

- For the next researcher

  This study can be a reference or a source in conducting the further research.

1.5 Scope of the Study

The study is concerned with experimental research focusing on the speaking skills and the Four Cs for the electrical engineering students of Sultan Agung Islamic University (UNISSULA) in the academic year of 2017/2018, where they were taught a topic of describing a process implemented through project implementation. This study is limited to the sample used so that the findings of this study cannot be generalized to all students or academic courses.

1.6 Definition of Terms

To provide a clear understanding towards the content of this writing, some definitions relevant to the topic are provided:

a. Speaking

Speaking is a two-way process involving true communication of ideas, information, and feelings (Florez:1999).

b. Project Based Learning (PjBL)

In this case, the researcher uses an abbreviation of Project-Based Learning with PjBL to avoid the quite similar concept, Problem-Based Learning, which is

commonly abbreviated as PBL. PjBL is a teaching and learning method conducted in various practical activities by resulting particular products aimed at involving students with real life issues and exploring students' abilities or skills (BIE:2012).

c. the Four Cs

The Four Cs stand for Critical thinking and problem solving, Communication, Collaboration, and Creativity and innovation, which become the most essential skills in the 21st century education (NEA:2010).

1.7 Writing Organization

This study comprises five chapters: introduction, review of the related literature, research method, results and discussion, and conclusion.

The first chapter presents the introduction of the study which is composed of the background underlying the study, problem statement, objective, significance of the study, definition of key terms, and organization of the thesis writing. The second chapter presents the literary reviews in the form of previous studies and underlying theories which are needed to support the study. The third chapter explains the methods used in this study, including the research design, the population and sampling, the instruments, the data collection, and the data analysis. The fourth chapter covers the results of the study in the forms of quantitative data and qualitative data. It also describes the discussion representing the analysis of the results. The fifth chapter discusses the conclusion and suggestions dealing with the implementation of this study.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

This chapter elaborates the review of the literature: previous studies and underlying theories, which cover speaking skills, Project-Based Learning, and the Four Cs.

2.1 Previous Studies

Dozens of researchers have used PjBL to examine its effectiveness to improve specifically speaking skills. Yiying (2015) implemented PjBL to develop speaking and writing for Chinese college English class. Spending 10 weeks of semi-structured projects in the forms of project proposals, presentations, and survey designs and sheets, the research provided results that the students' ability in English highly improved. Pratiwi (2016), in her master thesis, conducted experimental research design to discover the impacts of PjBL learning to enhance oral communication skills and motivation for the eighth graders by giving some projects: narrative-text presentation, drama performance, and wall-magazine presentation. These projects were effective to increase the students' speaking performance and motivation. Kovalyova, Soboleva, Kerimkulov (2016) from Russia applied PjBL to improve English communication skill on engineering students. The result showed that their written and speaking communication skills significantly improved. Astawa, Artini, and Nitiasih (2017) implemented PjBL to find out its effectiveness to help the students' speaking and writing skill on junior

high students in Bali. Mixed-method design was applied and the findings showed that PjBL gave positive effects on speaking and writing skills. Furthermore, it was successful to make students feel enthusiastic, confident, creative, cooperative in team work. PjBL also offered positive benefits from the teachers' side since it could improve the teachers' motivation and satisfaction.

Next, using PjBL to evaluate its effects of oral communication on students of bachelor degree program through a series of projects: a digital recording, a recorded storytelling and film making, Molina and Cardona (2017) observed that their students experienced a great progress in their written and oral communication skills. Furthermore, Zare-Bestash and Sarlak (2017) revealed the influence of PjBL on Iranian EFL beginners. Employing experimental research design to 45 participants, the study spending 13 weeks showed a result that PjBL was effective to improve EFL beginners' speaking ability.

Several studies have also been conducted to find out the effects of PjBL on the 21st century skills in language classrooms. For instance, Musa et al. (2011) from Malaysia were interested in examining students' perspectives about PjBL in increasing the value of language learning for the needs of workforce. By using speaking activities, such as making conferences and reports and giving presentations. The results showed that the students preferred PjBL since it gave benefits in helping them finish the project work in groups. From collaborative learning, it revealed how students dealt with team work, conflict management, decision making, and communication skills. From the speaking skill, it is learned that 50% students found that PjBL was effective to improve their speaking ability

through interview activities to peers. To sum up, the study proved that PjBL could be used to prepare the students to face the 21st century workforce.

Kapusuz and Can (2014) investigated engineering students towards their life skills through PjBL. They found out that theoretical knowledge was not enough to support students to compete with the professional life. The result showed that the students had preferences: learning applications to learning theories, having communication in the form of speaking and writing as necessary as the theory, enjoying their autonomy during study by searching on the web when given a project, having forum sites to social network, and engaging teamwork to individual work.

Efstratia (2014) was concerned with an analysis about experiential education through PjBL. Brochures, wall-magazines, and presentations were the products of the activities. The bottom line is that PjBL was highly recommended for its ability to connect students with lessons and problems of the real world.

Some other researchers conducted research on PjBL to specifically analyze its effectiveness to improve elements of the Four Cs to non-English classrooms. Papanikolaou and Boubouka (2010) studied PjBL for improving collaboration skills for computer science students. By means of e-learning projects, the students effectively worked with their peers. Handhika et al. (2018) did pre-experimental research design to the physics education students to examine their level of conception. The result showed that PjBL was effective to enhance the level of conception and critical thinking.

Based on the previous studies, it can be learned that many studies from around the world have already approved the effectiveness of PjBL in enhancing speaking skills, conducted to non-English department students. In addition, some studies have investigated PjBL in its relation to the 21st century skills, even though they mostly focused on one variable, that is critical thinking or collaboration. My research topic is different from the other studies since it has a more comprehensive content. My research topic presents three variables: PjBL, speaking abilities, and the Four Cs. The Four Cs themselves are made up of four important skills: critical thinking and problem solving, communication, collaboration, and creativity and innovation, which have not ever been discussed before. Thus, this study is significant to present two features during the implementation, namely linguistic (speaking skills) and interdisciplinary features (the Four Cs).

2.2 Speaking Skills

Speaking has an important role in people's daily communication.

2.2.1 The Importance of Speaking

To speak is to communicate. Speaking is a fundamental need of human beings as a social creature. Humans require a form of interaction since they cannot suffice themselves. Based on this fact, speaking is a communication skill which is mostly-frequently used (Torky:2006). Similarly, Rivers (1981) comments that people use much more speaking than reading and writing. It can be obviously seen from the evidence that someone automatically prefers speaking to writing or

reading as a way of communication when meeting others. In other words, people mostly choose to be the speakers in their daily communication. It means speaking has become the most basic needs for communication.

Nunan (1991) mentions that the ability of creating a conversation is a key of someone's success in life. Being able to maintain a talk, to deliver and exchange information and ideas, to utter what he/she wants, to respond expressions and feelings, to express feelings in a particular language will build a strong impression to the speaking partners. The importance of speaking ability is also proposed by Baker and Westrup (2003:05) mentioning that students possessing a fluent English speaking communication will have better opportunities after school. They will have chances when looking for jobs and reaching a career life. It is supported by Staab in Alam (2003) stating that oral communication is not only a crucial communication device for facilitating us in daily activities, but also a priceless way of learning things in life. Learning from the importance of speaking skills according to many theorists, it is expected that educators start to alter their mindset in teaching speaking so that students will get more benefits in their learning process.

2.2.2 Teaching Speaking in the English Classroom

Handling speaking classes in the classroom can be challenging for the teachers or practitioners. In teaching speaking skills, teachers require particular skills in selecting, managing, organizing the classroom activities in order to make the classes understandable, authentic, diverse, but also enjoyable for both teachers and students. Therefore, it needs creative teachers to make the class interesting and

meaningful. Besides, it requires understanding teachers to know and respond the students' needs and difficulties.

Teachers can build activities which encourage students' curiosity that lead them to apply their oral communication. At the same time, teachers need to avoid giving too much correction on grammatical mistakes while students are speaking since it can risk their confidence-destruction which lowers their motivation (Allright and Baley:1991). Similarly, Tsui (1991:87) claims that over correcting activity done by teachers can increase students' anxiety which can lead to their low participation in practicing speaking. Harmer (1998) offers his view that by giving interruptions constantly to the students to correct mistakes, it has a tendency to bother the flow and the aim of the communication. From the negative effects of error correction to students' speaking, teachers are expected to be wise and careful when giving feedback on their students. Even if they give feedback, it should affect positively on their speaking performance.

Based on the aforementioned conditions, the teachers should learn the six types of speaking activities proposed by Brown (2000:271) to engage students' participation in the classroom. The first type is imitative. It refers to a drilling activity. In this stage, the students are demanded to listen and repeat a human tape recorder or the teachers themselves giving a short sentence, a phrase, or a word with the proper pronunciation and grammar. This is a controlled activity focusing on the linguistic features than the purpose of a meaningful interaction. The second type is intensive. In this level, the students will be given a clue by the teacher and the students will produce some short expressions of phrases, sentences, or

phonological forms. Teachers are the controllers in this activity as they determine the answers of the students. The activities supporting intensive types include giving ordered response, reading loudly, completing a sentence/ dialogue, having oral questionnaire, displaying pictures, and translating. The third type is responsive. In this stage, teacher direct students to respond what the teacher or another student asks or comments. It demands a short answer or comment, but authentic and meaningful, not in the form of dialogues. The activities of this type are having a question and answer session, giving instructions and orders, and paraphrasing (Brown, 2000:273). The next type is interactive/ transactional (conversation). This category includes the ideas of exchanging or delivering information, or facts, and ideas/ opinions between teachers and the students or another student. Conversations, role-play, discussions, interviews, and games are examples of this type (Brown, 2000:273). The fifth type is interactive/ interpersonal (dialogue). The aim of this type is to build a social connection between the speakers. There are some techniques that should be mastered by the speakers of this type, such as ellipsis, sarcasm, slangs, humor, and other sociolinguistics features in order to create mutual understanding. The last type is extensive (monologue). This type allows students to have extended monologues, which can be performed in activities like oral presentations, story-telling, report-telling and speeches. Students can present the activities in either a planned or a simultaneous action.

Learning from the types of speaking classroom activities, it can be seen that it needs steps or processes to master speaking skill in a new language for the

students. Teachers are demanded to be able to see accurately their students' speaking levels and conditions so that they can achieve the learning goal.

2.2.3 Project-Based Learning (PjBL)

The definitions and criteria, and the steps of Project-Based Learning are discussed as follows:

2.2.3.1 Definitions and Criteria of Project-Based Learning

Project-Based Learning is regarded as a growing pedagogical method developing to support the 21st century learning as well as a solution to anticipate boredom and fear of the students during the classroom activities in general.

There are various definitions of PjBL according to theorists. Sepulveda (2016) from University of Oregon states that PJBL is a method which provides questions and challenges to overcome, needs them to collect information from a broad range of resources and requests them to invent an initial answer that results in a product or performance. This is in line with Goodman (2010) who argues that PjBL is an instructional approach created for students that enables them to solve challenges through a series of learning activities and real assignments. Similarly, Boss (2012), states that PjBL is a learning method which introduces problems and challenges and invite students to overcome them. From the definitions, it shows that the theorists highlight how students deal with solving challenges on PjBL. In this respect, Buck Institute for Education (BIE), adds that PjBL usually takes certain time for students to explore knowledge and abilities through investigation. Overall, it can be concluded that that PJBL is a learning method which is created

to solve problems and answer challenges to students which commonly requires particular time to accomplish.

In accordance with the theorists, Thomas (2000), who conducted a literary review of PjBL approaches, defines that PjBL as a model which arranges learning through projects. He clarifies that projects are not same as "tasks" that are usually performed by teachers so far. Therefore, Thomas formulates five characteristics of projects in Project-Based Learning. They are (1) curriculum-based, (2) student-driven, (3) a constructive inquiry, (4) autonomy, and (5) realism.

First, PjBL projects are curriculum-based. It means that the themes performed in the projects should be adapted from the curriculum. Teachers basically use projects only as a strategy to make students learn the concepts well from the curriculum. Students will learn and explore the concepts and encounter some difficulties in their learning process and try to solve them. Second, PjBL is student-driven. It means projects use issues or questions which encourage students to meet their basic understanding. Students are expected to answer the challenges given through the projects. Third, PjBL performs a constructive inquiry. Students are pushed to search and explore new information and knowledge to solve the problems that lead them to their new experiences, skills, and understandings. Fourth, projects provide autonomy learning for the students. The projects give students an opportunity to experience autonomy learning. Teachers serve as a facilitator and a mentor who gives feedback and continuous guidance and allows students to consult with. Besides, teachers also leave students to have their own autonomy and freedom to finish their work by their own way.

Fifth, projects emphasize on realism, not school-like learning. It means that any problems or questions offered by the teachers tend to be similar as the conditions in the real world so that students feel like facing a reality while conducting the projects.

From the criteria mentioned by Thomas (2000), it can be concluded that the PjBL method differs from the traditional method. PjBL is said much developed from the traditional one since it can be adjusted with the needs and situations. The main point underlying the difference between PjBL and the traditional assignment is the emphasis of the authenticity, constructivism, and the importance of the "new basic skills" which is highlighted by PjBL (Diehl et al., 1999). First is authenticity, which is basically relevant to the PjBL's criteria from Thomas, meaning that the themes of the projects made are basically based on the syllabus and curriculum. The teachers and students are allowed to develop the projects so that the main themes are still on the right track or the curriculum. Second is constructivism, which is the ability to construct the knowledge. The students are required to look for information, knowledge, and sources so that they can compile the projects. Students build their own understanding and solve the problems they face in conducting the projects. Lastly is building new basic skills, meaning that students are led to learn to new skills which are important to support their project accomplishment though they may not be able to do any specific skills before.

2.3.2 The Steps of Project-Based Learning

Stoller (1997) proposes the 10-step sequence of project work to give a more detail description and to provide maximum benefits of a project in developing the meaningful projects. The existence of language demands in the step 4, 6, and 8 of the sequence facilitates the teachers to explore the projects related to the language education and the students can also employ projects to achieve the target languages. From this feature, the students can see that their learning activities by using projects are relevant to the target languages they need to learn. However, the use of language demands as shown in the sequence is adjustable, depending on the target languages and the needs of the students at the time.

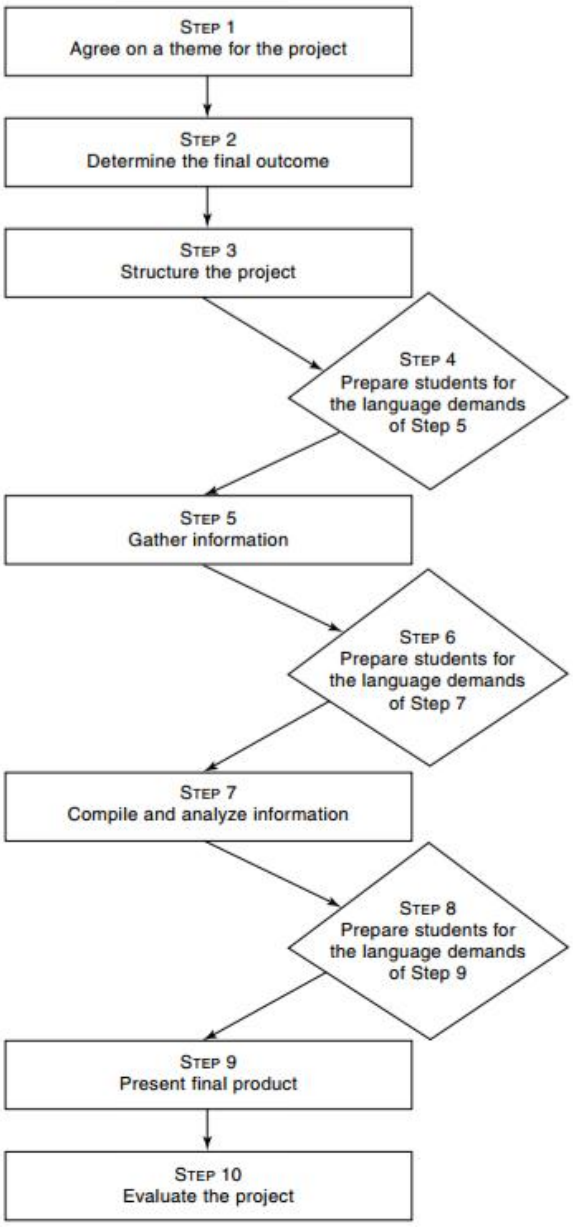

Figure 2.1. Steps of Creating a Project in a Language Classroom.

Following the 10-steps sequence of constructing a project in a language class in a good order is important for the maximum results. The illustration of each step is describe as follows:

1. Step 1: having the same idea towards a topic of the project. Teachers and students have the same perspective and commitment towards the theme of the projects. Even though the teacher may have decided the series of projects, students are given an opportunity to adjust or to suggest.
2. Step 2: determining the final outcome. Teachers and students have the same ideas towards the goals and end products. For example, teachers and the students decide to have production, performance, writing, or any other projects for the final outcomes. It means that students may result the creation of videos, interviews, presentations, brochures, posters, or any other work.
3. Step 3: structuring the project. Teachers and students arrange parts of the project related to what information ought to be included in the project or how information can be obtained. This step also allows the teachers and students to determine what roles the students have and what time line the students need to follow from the beginning till the end of the project.
4. Step 4: preparing useful language input needed by students for collecting information. Teachers plan the language input which may be used to complete the project. Teachers may also give some clues of sources that students can search to complete their work. For example, titles of books or journals, Youtube channels, or website addresses.
5. Step 5: gathering information conducted by students. Students collect information which is relevant to their projects.

6. Step 6: preparing students for the language learning for data analysis and compilation. Teachers help the students learn the language needs in the process of selecting, summarizing, and translating the information they get from any sources. For example, if the students have difficulties in reading terms related to data in the form of tables and numbers, the teachers can help the students about this.
7. Step 7: compiling and analyzing information conducted by students. The students compile and analyze the data they get from different sources, and sort and select it based on their needs. The students choose which information is good to be presented as the evidence in their presentation.
8. Step 8: preparing the students to learn the language demands before the final product presentation. The teacher helps the students for the language input for their final presentation. The teacher checks the students' preparation related to the language input they will use in the presentation, or the teacher gives the students a consultation session that enables the students to ask about their language needs. For example, if students are going to give a presentation about one topic, teachers can assist by giving them steps of giving a presentation, such as how to open a presentation, how to describe the outline of the presentation, how to tell the time allocation of the presentation, how to lead a question and answer session, and how to close a presentation. Besides, the teachers check the points of information they should put in the project. For example, if the students prepare of describing objects, they need to check what tenses or grammar

used to describe things, how to say the words, how to use the correct intonation.

9. Step 9: presenting the final product by students. Students present their end products in front of their friends and teacher. After finishing the presentation, the teacher can give feedback related to the presentation. Their peers or other groups can also give their input for the students' better performance.
10. Step 10: evaluating the projects by students. The final product presentation is not the end of the processes. Teachers still need to ask the students to have self-reflection where they evaluate themselves related to improvement they make or difficulties they encounter during the project's implementation. This information is advantageous to give the teacher input for future classroom projects.

From the 10-steps sequence mentioned before, it can be seen that each step is a process of learning for students. This process-oriented method can surely give meaningful content for students. They learn how to analyze and interpret information, how to plan, how to design, how to manage, and how to accomplish their projects. These activities allow students to explore their skills and knowledge needed in each process of learning. Learning from the experiences, PjBL can be a vehicle to stimulate students in learning a particular language through content learning and create classroom atmospheres involving collaboration, communication, creativity, and problem solving. Thus, PjBL is regarded as a fun, fruitful, stimulating and empowering teaching method which

can develop students' confidence and self-centeredness as well as students' language skills, deep learning, and thinking abilities (Stoller:2002).

2.4 The Four Cs (Critical Thinking and Problem Solving, Communication, Collaboration, and Creativity and Innovation) as the 21st Century Skills

The AMA 2010 Critical Survey, directed to executives, found out that three of four executives (75.7%) answered that they agree the Four Cs will become more crucial in the future. This evidence gives an emphasis that preparing students for their future with skills that are most relevant to 21st century learning. Those skills are not only used to answer the problems of the present professional life but also used to face difficulties of the changing workforce in the future life. It is supported by Trilling and Fadel (2009) who support that students can contribute effectively to the word life and career life after they graduate from schools, colleges, universities, and other higher institutions. Therefore, studying at schools should be used to shape the students to be prepared for their future.

The Partnership for 21st Century Skills (P21), was the pioneer of the Four Cs establishment in 2002. P21 includes: (1) Global high-tech corporations, such as Apple, Adobe, Cisco, Lenovo, HP, Dell, Ford Motor Company, Intel, Microsoft, (2) Profit educational companies which are well-known for their innovative learning products and services, such as Pearson, EF Education, K-12, Lego, McGraw-Hill, (2) Non-profit educational organizations which commonly provide familiar teaching materials, content, and trainings, and school, educator,

and learner programs, such as NEA, ETS, Sesame Street Workshop, Education Networks of America, Learning Point Associates. These founding members design a new educational paradigm called *Framework for 21st Century Learning* which identifies and arranges skills and knowledge which mostly need to be effectively taught and what should be mastered to prepare students' success in the Digital Economy. Among the important skills needed in the 21st century, Learning and Innovation Skills represented by the Four Cs are the most crucial ones for students. Trilling and Fadel (2009) emphasize that the learning and innovation skills which potentially enhance students' life skills are seen as one of the key factors in higher education because those skills have the same important values as academic skills. The elements and the definitions of the Four Cs are as follows:

a. Critical Thinking and Problem Solving

Hughes (2014:2) states critical thinking is a proses of investigating something to see the truth. Paul and Elder (2008:88) propose that critical thinking is a thinking method about subjects, issues, and contents, where the thinker develops the quality of his/ her thinking by analyzing, evaluating, and reconstructing it. From the definitions, it is concluded that critical thinking is about investigating issues or subject by analyzing and assessing it. While, according to P21, critical thinking cannot be separated from problem solving. P21 defines critical thinking as a process of reasoning effectively (formulating hypotheses or conclusions), employing systems thinking (analyzing an interaction of one process to another process to build a generalization), and forming judgements and conclusions (analyzing, assessing, synthesizing,

interpreting any information and arguments, and drawing a conclusion, and having a reflection for learning experiences and processes), and solving problems. Problem solving itself has characteristics: able to find an answer to any unfamiliar situations and able to find gaps and formulate significant questions to give useful solutions.

Bloom's Taxonomy is a well-known device to evaluate thinking in education. Published in 1956, the old version of Bloom's Taxonomy consisted of six ranks of cognitive abilities in a row from the lowest to the highest. In 2001, it was then revised to adjust with the cognitive development of the 21st century (Anderson and Krathwohl:2001). The orders of the old and the revised version can be seen below:

The Original Bloom's Taxonomy	**The Revised Bloom's Taxonomy**
evaluation	Create
synthesis	evaluate
analysis	Analyze
application	Apply
comprehension	understand
knowledge	remember

Figure 2. The Original and the Revised Bloom's Taxonomy

From the orders of the two versions of the Bloom's Taxonomy, some differences are found. The level of *evaluate* on the top of the original version turns to be the second-top level in the revised version. The highest level of the revised

version is to *create*. It can be summarized that the high level of thinking is if someone can create something since he has already encountered some processes of thinking levels. On other words, when someone creates something, he/ she automatically plans, designs, constructs, produces, or make hypotheses. Before reaching those processes, he/ she must do some processes: analysis, checking, and evaluation.

From the discussion of six levels of cognitive abilities above, it is learned that there are two categories of thinking: (1) the lower-order thinking, namely remembering, understanding, and applying, (2) the higher-order thinking, namely analyzing, evaluating, and creating. The higher-order thinking represents the characteristics of critical thinking commonly proposed by many theorists. Meanwhile, remembering or memorizing activity is not enough to support success in education. Recalling or understanding facts and information is not said to be critical since it is not an active action. This kind of learning will only direct students to surface learning, where students emphasize on memorizing the material given by the teachers without knowing the real meaning. Yet, the teachers should lead students to adopt deep learning, where the students learn to the way they fully understand the meaning of the material so that from this base they can create, develop, and innovate ideas related to the topic they are discussing (Fry, Ketteridge, and Marshall, 1999:29).

Even though critical thinking is such an important skill to have, it will mean nothing if it cannot be transferred to others since critical thinking is a start of creativity and innovation. Therefore, it needs some relevant skills, such as

communication and information literacy. Speaking skills, one of communication ways, is essential to support critical skills. If one engages with critical thinking, he/she analyzes, assesses ideas, criticizes, and makes judgments and conclusions. One also needs feedback and judgment from others to produce great ideas. These processes of transferring information definitely can work better if one is assisted by speaking ability. Meanwhile, problem solving as one element of critical thinking also requires the help of others in the form of teamwork and cooperation to work effectively.

b. Communication

According to Beder (2000), communication skills are ones that should be developed to the engineering students since that those qualities are what the employers need from them. In this regard, he suggests that communication skills should be a part of curriculum. Similarly, NEA (2010) states that communication skills have significant values in the 21st century since they relate to the other skills, such as collaboration. Meanwhile, P21 defines communication as ability to communicate clearly. It means someone is considered to be communicative if he/ she is able to deliver his/ her ideas through verbal and non-verbal communication, listen and elaborate meaning, apply communication for a variety of purposes, equip with multimedia and technology, and communicate in effective ways in many different conditions of work. From the definition, communication is inseparable with collaboration since when people express their ideas and thoughts, they need other parties to support and implement it so that the goals are achieved. On other words,

speaking skill as one form of oral communication skills definitely facilitates the work of collaboration since when people work together, they must require a communication tool to connect each other.

c. Collaboration

Pfaff and Huddleston (2003) state that collaborative work can grow intrinsic motivation and develop persistence on the part of students, especially when problems appear so that they are required to transfer their knowledge and experience to solve them. It means that collaborative work can connect people closer. P21 defines collaboration as ability to collaborate with others. It is shown by working in effective and respectful ways with multi different teams, opening possibilities and contributing meaningful work with other parties to achieve goals, and sharing responsibilities and appreciating each team member's contribution. Working effectively with different people must be supported by one communication skill. Speaking is the most practical communication way to interact with each other among team members of the group work.

d. Creativity and Innovation

Creativity includes knowledge, critical thinking, and motivation (Adams:2005). Sternberg (2007) urges the importance of creative skills. He states that successful people are those who are creative and motivated to create visions to realize a better world for everybody, have analytical intellectual skills, evaluate their visions and invite others of its meaning and wisdom, and assure that their vision is not dedicated to only one's

self-interest. This is in line with an international writer, Daniel Pink in NEA (2010) stating that only creative people and empathizers possessing divergent minds will survive and make the future lively and meaningfully. These kinds of people will definitely receive the greatest rewards from societies and take part in giving outstanding joys to the societies. According to P21, creativity and innovation are defined as ability to think in creative ways, to work in creative ways with others, and to implement innovations. From the definition, it can be seen that creativity and innovation are essential in the 21st century as those skills can improve human civilization. Those skills are also connected to the other elements of the Four Cs such as critical thinking, communication, and collaboration. Creativity needs team work, leadership, adaptability, and interpersonal skills, and innovation requires a connection and collaboration with others. These activities show that speaking as one medium to connect people, has an important role to actualize the creativity and innovation processes.

From the definition of the Four Cs, it can be concluded that teaching the Four Cs at schools, college, institution, university, or other higher education is essential since it can prepare students to survive in their future. Students will be more skillful and ready to answer the challenges of the work life.

CHAPTER III

RESEARCH METHODS

This chapter describes the research method of the study. It contains some important information about the research applied in this study. With this regard, this chapter reveals the research design, population and sampling, instruments, data collection, and data analysis.

3.1 Research Design

A quasi-experimental research design with non-equivalent (pretest-posttest) control-group design was used in this study. It means that there were the experimental group and control group observed and both groups were given pretest and posttest, but the participants were not randomly taken (Cohen, Manion, and Marrison (2007:283). In this study, the experimental group got a treatment and was taught by using PjBL, but the control group was taught without using PjBL. This study also used quantitative and quantitative data. The quantitative data were shown by the results of speaking tests and questionnaires and qualitative data were presented by the results of interviews.

3.2 Population and Sample

Total population sampling was implemented in this research since the whole population was used as the samples. Fifty-three students of Sultan Agung Islamic University majoring electrical engineering in the academic year of 2017/ 2018 took part in this study, all of whom are male students. There were 26 students for the control group (Class A) and 27 students for the experimental group (Class B).

The members of both groups only followed the schedules prepared by the admin officer of the faculty so that there were no changes related to the participants in this study. Purposive sampling was used since it was done based on my interest. Among non-English department classes that I teach, I was interested in doing research on the electrical engineering students for they had some characteristics needed in this research, such as their needs of speaking skills, their needs of the certain important skill development, their needs of practical learning, their similar speaking level, and their ESP class category.

3.3 Instruments

Speaking tests, questionnaires, interviews, and observations were instruments employed in this research. Speaking tests were given for measuring speaking abilities of the groups before and after a treatment. Each group was given an oral test with a topic about describing a process (how to do, how to make, and how to operate something). A set of pictures was used as media for elicitation. The pictures were adapted from Sari (2004) who also conducted the same topic for her reading class. The speaking rubrics of this study were adopted from Brown in assessing speaking (2001:406-407). The next instrument, questionnaires consisting of 38 statements using five Likert-type close-ended items ranging from '*Strongly Agree* to *Strongly Disagree*' were employed. Furthermore, semi-structured interviews were done to collect the students' perspectives towards to effects of the speaking projects towards their performance. Observations in the form of field-notes and video-recordings were applied to record detailed events in

the classroom and include detailed impressions, expressions, and attitudes of the students during the class participation.

3.4 Data Collection

In collecting data from tests, speaking tests were done individually to the students. In this process, a research collaborator, who was an English practitioner and lecturer, helped me to observe the conditions of the classroom. We worked together to identify the students' speaking levels through pretest and find a solution for the speaking problems faced by the students. We also compared, evaluated, and reflected the implementation of the research based on the students' performance results. The collaborator provided field-notes and the students' speaking posttest results to present her assessment. Besides, the collaborator gave suggestions and feedback for the further planning of the classroom activities. To see the students' performance, the collaborator was facilitated by audio recordings and video recordings to get more detailed and vivid information of the students' activities: pretest, teaching and learning process, and posttest. Based on the latest procedure, it can be seen that observations were also conducted in this research by using a camera and a recorder from a smartphone to record what was happening in the classroom besides taking field-notes. The next instruments, questionnaires, were accordingly distributed to the experiment group who received a treatment by using PjBL. The mean scores of the questionnaire results were used to measure the students' agreement levels of the effectiveness of PjBL in enhancing the speaking skill and the Four Cs. To give better understanding and interpretation for

each statement of the questionnaire, bahasa Indonesia was employed. Semi-interviews were conducted as the final session of this research to the experiment group to see their perspectives and ideas related to the research questions.

3.5 Data Analysis

To answer the first question of the research about the effectiveness of PjBL to improve the students' speaking skills, the scores of pretest were initially classified from 1 to 5 categories based on the Brown's speaking rubrics; very poor (1 score), poor (2 score), average (3 score), good (4 score), and very good (5 score) representing the students' speaking ability. The scores were then accumulated from each speaking aspect. Processing the data for normality test and homogeneity tests were done accordingly. Normality test was applied to see whether or not the pretest data of the experimental group and the control group had a normal distribution. After the normality test, it was followed by homogeneity test by using Levene's test method to know if variances of pretest data of the two groups were homogeneous or not. The results of the two latest tests in this research proved normal and homogeneous, so the teaching learning process was continued. The final step was the implementation of *Independent T-test*. The significant difference of the posttests data was shown by *Levene's test* method. If the two-tailed test (Sig. (2-tailed)) shows lower than 0.05, it indicates that there is significant difference between the mean scores of the groups. Therefore, the null hypothesis (H_0) is not supported. Meanwhile, if the two-tailed test is higher than 0.05, it indicates that there is no significant difference of the

mean scores of the posttests of the two groups. Therefore, the alternative hypothesis ($H_{1)}$ is not supported.

To answer the second question about the effectiveness of Project-Based Learning to promote the Four Cs in learning speaking, the results of the questionnaires, interviews, and observations were analyzed. The Likert Scale was employed to evaluate the students' responses through questionnaires. The questionnaires emphasizing on the speaking skill were presented by 12 items. The questionnaires focusing on the Four Cs comprised 26 items; critical thinking and problem solving (11 items), communication (5 items), collaboration (3 items), and creation and innovation (7 items). All the favourable statements were chosen based on the relevant theories or references dealing with the topic and scored from minimum to maximum: strongly disagree (1 point), disagree (2 point), neutral (3 point), agree (4 point), strongly agree (5 point) (Johnson, and Christensen, 2014:286). After the score for each item was given by the respondents, the accumulation of these scores presented each respondent's scores and these scores were administered with *Microsoft Excel* to find the mean scores. The data gathered from the questionnaires were analyzed and classified to avoid bias result and classified into five categories based on their mean scores (low, poor, fair, high, and very high). Firstly, the score was gained from the number of students answering the item or statement of the questionnaire. This data analysis would provide the quantitative data which would be validated by qualitative data.

The results of the interviews were analyzed, sorted, coded, and interpreted to support the quantitative data. Field-notes, audio and video recordings from

observations were also examined to support, strengthen and cover the weaknesses of different strategies previously used in the research design.

3.6 Validity and Reliability

In this research, there are two types of validity employed for speaking instruments: (1) Content validity is used by comparing the content of the instruments and the lesson that is being taught. Since it was educational research for testing speaking skills, the content of the instruments must be relevant to the syllabus (Sugiyono: 2014). To fit the content validity, in this research, the employed instruments referred to the lesson material which was based on the syllabus. (2) Construct validity can be applied by comparing the theories, definitions, and characteristics of the variables: project-based learning, speaking, and the Four Cs according to literature to the characteristics possessed by the students in the reality. The questionnaires were then proceeded by being consulted with the experts. In this case, I consulted the items of the questionnaires with my advisors. After this, the questionnaires were validated to correlate scores of each item of the questionnaires by using Pearson Product Moment test of SPSS. The validity of each item of the questionnaires was done by making a comparison its r_{value} and r_{table} , or sig value 5%. The item is valid if the r_{value} is higher than r_{table} or it has significance value < 0.05%. To know the $r_{table,}$ there is a formula:

$df = n - 2$

df: degree of freedom

n: total respondents

Considering that the total respondents of this research were 27, so the *df* is 25. Based on the *df* of 25 with sig 5%, r_{table} is 0.3809.

The process continued to reliability test to see the consistency of the respondents in answering the questionnaires of speaking and the Four Cs. There is a range of value for describing internal consistency by using this method: (1) if $\alpha \geq 0.90$, the consistency is excellent, (2) if $0.7 \leq \alpha > 0.9$, the consistency is good, (3) if $0.6 \leq \alpha > 0.7$, the consistency is acceptable, (4) if $0.5 \leq \alpha > 0.6$, the consistency is poor, and (5) if $\alpha < 0.5$, the consistency is unacceptable (Cortina:1993). In this research, all items of the questionnaires showed Cronbach Alpha values which were more than 0.60, indicating that all of the items could be used for the research.

CHAPTER IV
RESULTS AND DISCUSSION

This chapter presents the research findings and discussion. The research findings present the answers of the two research questions. The first question is based on two hypotheses: (1) PJBL is effective to enhance the student's speaking skill (H_0), and (2) PJBL is effective to enhance the students' speaking skill (H_1). While, the discussion explains the results of the research questions.

4.1 RESULTS

The findings are divided into two sub-chapters based on the two research questions:

4.1.1 The Effectiveness of PjBL in Enhancing the Students' Speaking Skills

The experimental research results were emphasized to reveal the answer of the first research question.

4.1.1.1 Experimental Research

The experimental research conducted from March 14th - May 16th, 2018 was a way to answer one of the research questions whether or not PjBL could effectively enhance the speaking performance of the electrical engineering students on the first year. The result would be shown by the *Independent Sample T-test* of SPSS. There were some steps which needed to be done to get the final results.

4.1.2.1 Pretest and Posttest

The pre-test was held on the 14th March, and the post-test was done on the 9th May 2018 for Experimental Class and Control Class. The results can be seen as follows:

Table 4.1 Descriptive Statistic of Pretest of Experiment and Control Class

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-Test Experiment	27	5	14	8.74	2.551
Pre-Test Control	26	5	13	8.08	2.497
Valid N (listwise)	26				

From the table 4.1, two classes participated in the research, namely Experiment Class and Control Class. The Experiment Class had 27 participants and the Control Class had 26 participants. The two classes had the same lowest score, namely 5. However, the highest score of Experiment Class was 14 and the Control Class was 13. In addition, the mean scores shown by the Experiment Class were 8.74 and the means scores of the Control Group were 8.08. Overall, it can be seen that the results of both classes were in almost a similar level.

Besides the descriptive statistic of both classes, the classification of the speaking levels was administered. The frequency scale of the pretest speaking results was classified into five levels: very poor, poor, average, good, and very good. The tables of the frequency scale criteria of the pretest speaking results of the experimental group and control group can be seen as follows:

Table 4.2 The Details of the Frequency Scale Criteria of Experimental Group:

No.	Scale	Pretest					Posttest				
		F	P	G	V	C	F	P	G	V	C
5	Very Good	0	0	0	0	0	0	0	0	0	0
4	Good	0	0	0	0	0	6	5	9	14	0
3	Average	4	3	2	3	0	14	13	13	11	16
2	Poor	16	18	13	14	14	7	9	5	2	11
1	Very Poor	7	6	12	10	13	0	0	0	0	0
Total		27	27	27	27	27	27	27	27	27	27

Table 4.3 The details of the Frequency Scale Criteria of Control Group:

No.	Scale	Pretest					Posttest				
		F	P	G	V	C	F	P	G	V	C
5	Very Good	0	0	0	0	0	0	0	0	0	0
4	Good	0	0	0	0	0	2	3	2	4	0
3	Average	2	1	1	1	1	7	5	9	10	5
2	Poor	7	14	8	9	5	14	15	13	11	14
1	Very Poor	17	11	17	16	20	3	3	2	1	7
Total		26	26	26	26	26	26	26	26	26	26

F: Fluency, P: Pronunciation, G: Grammar, V: Vocabulary, C: Comprehension

Table 4.2 shows that improvements appeared in all aspects of speaking, such as fluency, pronunciation, grammar, vocabulary, and comprehension for the experimental group. It can be seen that the “very poor” scale in pretest filled by several students in each aspect of speaking became zero in each aspect of speaking in the posttest. It means that the students with the “very poor” speaking levels decreased in each aspect, or the students’ skills in speaking of the experimental group highly improved. Even though the experimental group improved the speaking skills by the decrease of the “very poor” level, the experiment group still could not improve the students’ speaking level from the

“good” level to “very good” level. It is likely quite understandable since electrical engineering employs lots of particular technical terms. Besides, to improve the speaking skill it needs lots of practice and lots of time. However, the students’ commitment and efforts to use English during the classroom activities were highly appreciated.

In the aspect of comprehension, the number of students with the “average” criteria increased from zero student in the pretest to 16 students in the posttest. It means that the students’ capability in understanding the conversation in the classroom improved. The students could quite understand the conversation happening in the classroom so that they could reply what other people said, commented, or asked.

In the aspect of fluency, it also shows a highly improvement, indicated by the total decrease of students in the “very poor” scale and the decrease of students in the “poor” scale, and the increase of students into the “average” and the “good” scales in posttest. It means that students could apply the language in a smooth way and able to engage in any conversation. Some hesitations were sometimes met, but they did not interfere with the communication.

In the pronunciation aspect, it improved as shown by the increased number of students in the “good scale” in the post test. It means the students performed quite rare errors in pronouncing English words. Or, they might produce some errors, but they were still intelligible. In the grammar aspect, most students improved into the “good” scale. It shows that the students could apply grammar

properly in their English utterances. The students' ability in the vocabulary aspect also improved as shown by the highest number of students posting in the "good" scale compared to the other aspects. It was definitely caused by a series of practice and performances conducted by the Experimental Group. By highly-frequent practice, they were pushed to use and explore daily vocabulary and technical terms in electrical engineering to support their performances.

Table 4.3 describes the progress of the control group. The control group also experienced slight progress in each aspect of speaking. It is proved by the data that there were still some students in the "very poor" and many students in the "poor" scale of each aspect in the posttest, and this shows the most increase from the control group.

4.1.2.2 Normality Test

One-Sample Kolmogorov-Smirnov Test was applied to discover the result. The result of normality test can be seen as follows:

Table 4.4 Normality Test of Experimental and Control Group

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Class	Statistic	df	Sig.	Statistic	df	Sig.
Gained Scores	Pretest Experiment	.134	27	.200*	.942	27	.134
	Pretest Control	.167	26	.061	.919	26	.043

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

The table of normality test above indicates that the significance of Experimental Group was 0.200 (p > sig 0.05), which means the probability was

higher than 0.05. Furthermore, the significance of the Control Group was 0.61 (p > sig 0.05), which means that the significance was higher than 0.05. This results indicate that pretest data for both Experimental Group and Control Group were normally distributed.

4.1.2.3 Homogeneity Test

When the data were homogeneous, a treatment could proceed to the Experimental Group. Therefore, it was necessary to do the homogeneity test after gaining the pretest results. The following is the result of homogeneity test:

Table 4.5 Homogeneity Test

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Gained Scores	Based on Mean	.004	1	51	.952
	Based on Median	.010	1	51	.922
	Based on Median and with adjusted df	.010	1	50.919	.922
	Based on trimmed mean	.000	1	51	.996

From the table of homogeneity test above, the significance value was 0.952. It means the probability was higher than 0.05. Therefore, it can be concluded that the data of the two groups were homogeneous. In other words, they had the same or similar variance. Based on this result, *Independent t-test* was able to be continued since the result of homogeneity test was homogeneous.

4.1.2.4 Independent Sample T-Test

The data for this test were taken from the posttest scores of the two groups. The group statistic of *Independent Sample T-test* in this research is shown in the following:

Table 4.6 Group Statistics of Posttest

Group Statistics

	Class	N	Mean	Std. Deviation	Std. Error Mean
Gained Scores	Posttest Experiment	27	15.33	2.948	.567
	Posttest Control	26	11.62	3.522	.691

The table of group statistics shows that the mean scores of the Experimental Group with 27 students was 15.33 and the mean scores of the Control Group with 26 students was 11.62.

Table 4.7 Independent Sample T-test

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Gained Scores	Equal variances assumed	.555	.460	4.173	51	.000	3.718	.891	1.929	5.507

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Gained Scores	Equal variances assumed	.555	.460	4.173	51	.000	3.718	.891	1.929	5.507
	Equal variances not assumed			4.159	48.769	.000	3.718	.894	1.921	5.515

Levene's Test for Equality of Variances was presented. To find out the homogeneity of the two groups, an *F*- statistic and a significance value were observed. If the significance value is higher than 0.05 ($p > 0.05$), it is said that the variability in the two groups is significantly the same. From the Levene's test, the significance value shown was 0.46 which was greater than 0.05, meaning that the homogeneity of variances was met. Therefore, the data results in the first row, "Equal variances assumed" were accordingly used.

The output in the first row "Equal variances assumed" shows *t*-value ($t = 4.173$) and the degree of freedom ($df = 51$). The two-tailed test (Sig. (2-tailed)) was 0.00. Considering that the significance value shows 0.00 that was less than 0.05 ($p < 5\%$), the null hypothesis (H_0) was not supported. It is concluded that the mean scores of the two groups were significantly different. On other words, the

result indicates that a treatment with PjBL was successful to enhance the students' performance in learning speaking.

4.1.1.2 Questionnaires

To discover the students' perspectives on the effectiveness of PjBL to influence their speaking performances, the students of the Experimental Group were given a set of questionnaires, some of which discussed their speaking skills with PjBL. Each item of the questionnaires was tested by using validity test and reliability test. From the speaking questionnaires, there were actually 13 items in total. However, 1 item was not valid, so that it was excluded.

Based on the validity test, the 12 items of speaking items show r_{value} ranging from 0.393 until 0.686 which was higher than r_{table} (3.809), it means that the speaking questionnaires used in this research were valid. Meanwhile, the reliability test shows that the Cronbach's Alpha value was 0.802, greater than 0.6 indicating that the items of the questionnaires were reliable and able to be used for the research. It can be concluded that each item of the questionnaires could represent what was tested and measured and were able to show the consistency and stability of respondents to answer the questions from time to time.

The next step was the presentation of the Likert scale scores through the data interpretation. The mean interval was used to analyze the score criteria. The interpretation of the score criteria of the questionnaire result was divided into 5

criteria: low, poor, fair, high, and very high. The score criteria of the questionnaire result are shown in the following table:

Table 4.8 The Score Criteria of the Questionnaire

No.	Score Range	Criteria	Meaning
1	4.21 – 5.00	Very High	The *Very High* rate represents that most respondents strongly agree with the statement.
2	3.41 – 4.20	High	The *High* rate represents that most respondents strongly agree with the statement.
3	2.61 – 3.40	Fair	The *Fair* rate shows represents that most respondents are unsure with the statement.
4	1.81 – 2.60	Poor	The *Poor* rate represents that most respondents disagree with the statement.
5	1.00 – 1.80	Low	The *Low* rate represents that most respondents strongly disagree with the statement.

The placement of each category of the questionnaire result is based on the above data.

Table 4.9 The Interpretation of the Speaking Questionnaire

No.	Concept	Statement	Total Score	Means	Criteria
1.	Speaking Grant (2002)	The projects of Project-Based Learning (presentation, video-tutorial, video-campaign, poster) gave more opportunities for students to speak English actively.	120	4.44	VERY HIGH
2.	Speaking Assessment (Brown:2003)	Students learned to speak English in good pronunciation.	121	4.48	VERY HIGH
3.	Speaking Assessment	The projects helped the students enrich with	113	4.18	HIGH

	(Brown:2003)	vocabulary.			
4.	Speaking Assessment (Brown:2003)	The projects could encourage the students to speak with good grammar.	117	4.33	VERY HIGH
5.	Speaking Assessment (Brown:2003)	The projects (presentation, video-tutorial, video-campaign, poster) could make the students perform a comprehensible communication while speaking English.	113	4.18	HIGH
6.	Speaking Assessment (Brown:2003)	The projects made the students speak English fluently.	117	4.33	VERY HIGH
7.	Speaking Assessment (Brown:2003)	The projects improved the students' English ability for their exchanging information, facts, opinions, and ideas, with others during the question and answer sessions.	113	4.18	HIGH
8.	Motivation (Valerand (1997) in Dornyei (2001)	The students enjoyed the projects for pleasure and satisfaction.	117	4.33	VERY HIGH
9.	Motivation Brown (2000)	Project-Based Learning could improve the students' confidence and self-esteem.	108	4.00	HIGH
10.	Motivation Brown (2000)	The students engaged PjBL activities for their own sake and enjoy the lesson (self-determination).	114	4.22	VERY HIGH
11.	Motivation	The projects made me motivated to learn speaking in English.	113	4.185	HIGH
12.	PjBL	The students felt that PjBL was a good teaching and	119	4.40	VERY

		learning method to prepare students for their future life.			HIGH

From the speaking questionnaire result, it can be seen that the speaking questionnaires consisted of 12 statements. Each statement was based on theories and associated with the students' experiences. Seven statements belonged to the *Very High* category and presented 58.3% and 5 statements were classified as *High* category and presented 41.7%. From this finding, it can be concluded that the number of the *Very High* criteria was higher than the *High* criteria. It means that most respondents strongly agreed that Project-Based Learning was able to enhance their speaking skills effectively through the speaking projects given by the teacher.

4.1.1.3 Interviews

The interviews were conducted after post-test. All 27 students from the Experimental Group took part in sharing their perspectives and opinions. The sample of the questionnaire result is shown in the following.

Table 4.10 The Interview Samples of Speaking Skill

Statement	**Concept**
Speaking	**a. Confidence**
I am more confident to speak in English. I used to be so afraid of delivering my thoughts in English, but I am more comfortable to convey my ideas now. (**WJ03**)	
Speaking	**b. Shyness**
PjBL was useful to reduce our shy feeling because we often practiced our English in front of the class. We were also pushed to perform. Yet, we felt more confident since when we answered the questions from the audience, we thought together	

with my friends. **(AR20)**	
Speaking	**c. Self-Centeredness**
When we were asked to do the tasks, it should have come from our own will. The lecturer was guiding us, but our own motivation was the key of the success. (**HS12**)	
Speaking	**d. Grammar**
When doing an English presentation in front of the class and making a campaign video, we learned how to use grammar correctly. These activities really increased out English learning outcome. We did feel our English improved. (**RAA5**)	
Speaking	**e. Vocabulary**
1. *PJBL really made our English improved. We had to find some new vocabulary that we did not know before and we finally uttered it in the presentation.* (**ANH02)** 2. *It improved our vocabulary, especially in electrical engineering terms, as it has particular terms*. (**MH3**)	
Speaking	**f. Pronunciation**
I am happy to learn how to pronunciation for some words I choose for my presentation. (**MF06**)	
Speaking	**g. Comprehension**
I basically understand what is taught in these activities. The materials are about describing things that has been taught by the teacher before. We also have learned procedure text material. Then we were assigned to apply those materials in our projects. **(MU25)**	
Speaking	**h. Fluency**
PjBL *improved my vocabulary because before I like to speak English just singing or watch movie because I want to try to speak English my English fluently.* **(WK04)**	
Speaking	**i. Activeness**
Yes, PJBL improved our English skill. It was because when we were having a presentation for our product, we needed to arrange a title, materials, components, procedures, strengths and weaknesses, and gave an explanation to audience in a good structure and a good manner. By the ability of managing these points, we were taught to understand, describe, and inspired innovations that had been discussed before. (**RS23**)	

Speaking	**j. Motivation**
1. *I have ever learned "The Principles of Three SA" (Terpaksa, Dipaksa, Terbiasa) meaning "3 Principles of SA" (Being Urged, Being Forced, and Being Accustomed)." It really works in improving our skill in anything, including in learning English language.* (**MU14**) 2. *Because we rarely practiced our English, by this method we had more chances to learn and motivate ourselves, especially when seeing our friends perform well in the classroom activities.* **(AS4)**	
Speaking	**k. Speaking performances**
That's it, Mom. Our presentation had such structures to follow, such as introducing our team members, delivering our title, then describing the material we were using, and explaining how to make it. All of them must be delivered in English so that we needed to learn English again. **(RS03)**	
Speaking	**l. Students' interests**
Through PjBL, the class was challenging, Mom. Since we are from engineering, we can apply it in our daily routines through English. **(WJ01)**	
Speaking	**English in the 21st century**
1. *PBL could improve our English. By the existence of technology development in this era, if we cannot accompany ourselves with English language, we will be left behind. We will not be able to follow the development in this world.* (**AM3**) 2. *Because I have a dream of studying abroad, so I want to learn English. In this globalization era, we will meet lots of foreigners. As the international language, English becomes urgency for everyone to survive in this century.* (**WK22**)	

The data show that Project-Based Learning was confirmed to give better achievement on the students' speaking performance. Those activities were positively felt by the students as they were able to elevate their speaking aspects: pronunciation, accuracy, vocabulary, comprehension. Besides, there were also some concepts that were found during the interview mentioned by the students, such as confidence, shyness, motivation, self-centeredness, activeness, interest, performance, and also points of view related to English in the 21st century.

4.1.2 The Effectiveness of PjBL is Effective in Developing the Students' Four Cs

To give answers the second question in this research, questionnaires, interviews, and observations were conducted and applied to the 27 students of the Experimental Group.

4.1.2.1 Questionnaires

Besides discussing speaking skills consisting 12 items, the questionnaires also discussed the other four concepts of The "Four Cs". Like the speaking questionnaires, before gaining the results of the questionnaires, validity and reliability test were done. From the results showed that each item of the total 26 was claimed to be valid, since r_{value} of each item was higher than 3.809. The items were also reliable, indicated by Cronbach Alpha value of the item which was greater than 0.60. It means that all the items were good to be employed as the instruments of the research.

The next step, the questionnaire results were interpreted based on the mean scores of each item. The following is the result of the questionnaire interpretation of each skill of the Four Cs:

a. Critical thinking and Problem Solving

Table 4.11 The Questionnaire Interpretation of Critical Thinking and Problem Solving

No.	Concept	Statement	Total Score	Means	Category
1.	PjBL (Capraro et al, 2013:2, Thomas, 2000:3) Critical Thinking and Problem Solving (Allen:2004, NEA, 2010:4)	Project-Based Learning developed the students' critical-thinking.	118	4.37	VERY HIGH
2.	PjBL (Capraro et al., 2013:10) Critical Thinking and Problem Solving (NEA, 2010:9)	Project-Based Learning were able to make students manage projects until finished.	122	4.5	VERY HIGH
3.	Critical Thinking and Problem Solving (NEA, 2010:9) Allen:2004)	Students could learn from evidence, arguments, claims, and beliefs to support their projects.	119	4.4	VERY HGH
4.	Critical Thinking and Problem Solving (NEA, 2010:9, Allen:2004)	Students could analyze the materials and others' opinions without being judgmental.	110	4.1	HIGH
5.	Critical Thinking and Problem Solving (NEA, 2010:9) PjBL (Goodman, 2010: 5, Capraro et al., 2013: 2, Larmer, J., Mergendoller, J., Boss, S., 2015:11-13)	Students could more comprehend the materials' given by exploring information in many media and references (books, internet, Youtube).	118	4.4	VERY HIGH

6.	Critical Thinking and Problem Solving (NEA, 2010:9, Allen (2004), PjBL (Capraro et al, 2013:2)	Students could evaluate the strengths and weaknesses of their projects.	121	4.5	VERY HIGH
7.	Critical Thinking and Problem Solving (NEA, 2010:9, Allen (2004), PjBL (Goodman, 2010:6)	Students gathered information and data related to their project.	119	4.4	VERY HIGH
8.	Critical Thinking and Problem Solving (NEA, 2010:10, Allen:2004)	Students could draw conclusions based on the data and information they gained.	117	4.3	VERY HIGH
9.	Critical Thinking and Problem Solving (NEA, 2010:10, Allen:2004)	Students were able to apply the projects as their learning experience and processes.	119	4.4	VERY HIGH
10.	Critical Thinking and Problem Solving (NEA, 2010:10, Allen:2004) PjBL (Larmer, J., Mergendoller, J., Boss, S., 2015:11-13)	Students could solve kinds of problems faced during their product experiment.	116	4.4	VERY HIGH
11.	PjBL (NEA, 2010:8, Allen:2004)	Students could answer their friends' questions with appropriate arguments.	122	4.5	VERY HIGH

From those 11 statements, it shows that most statements posted the *Very High* category: 10 statements got *Very High* and 1 statement got *High* response.

On the other words, the *Very High* category was presented in 91 %, while the *High* category was represented in 9 %. The *High* category was presented by 4.07, since its mean score was below 4.21.

Based on the aforementioned data, the idea of PjBL in fostering critical-thinking and problem-solving was strongly agreed by most of the respondents. It means that PJBL was regarded as an effective method to stimulate and push the students to explore their critical-thinking and problem-solving skill. One of the implementation was demonstrated by the students' efforts to answer the teacher's challenges (questions) offered before conducting the series of projects, which were formulated to be 'problems' in this method. The very condition was responded through the results of the questionnaire that indicate that most respondents strongly agreed that PjBL could effectively develop their critical-thinking and problem-solving skill during their English speaking projects.

b. Communication

Table 4.12 The Questionnaire Interpretation of Communication

No.	Concept	Statements	Total Score	Means	Category
1.	Communication (NEA, 2010:14)	The students could deliver their beliefs and ideas by using oral, written and nonverbal communication skill.	117	4.33	VERY HIGH
2.	Communication (NEA, 2010:14)	Students were willing to listen information effectively coming from other groups' opinions and thoughts.	111	4.11	HIGH

3.	Communication (NEA, 2010:14)	Students used English as a medium of communication in a variety of purposes.	113	4.185	HIGH
4.	Communication (NEA, 2010:14)	Students utilized multiple media and technologies to market their product effectively.	114	4.22	VERY HIGH
5.	Communication (NEA, 2010:14)	Students were able to communicate in diverse backgrounds.	115	4.3	VERY HIGH

From the table of questionnaire interpretation, it can be seen that the concept of communication skill was composed of five statements. Three statements of the questionnaire results were included in the *Very High* category, while two statements of the questionnaires were included in the *High* category. It can be said that the *Very High* category had a higher percentage shown by 60% compared to the *High* category shown by 40%. The provided data approved that most respondents strongly agreed that PjBL was effective to raise their communication skill.

c. Collaboration

Table 4.13 The Questionnaire Interpretation of Collaboration

No.	Concept	Statements	Total Score	Means	Category
1.	Collaboration (NEA, 2010:20) PjBL (Larmer, J., Mergendoller, J., Boss, S. 2015:11)	Students could show their ability to work well with varied teams.	122	4.51	VERY HIGH

2.	Collaboration (NEA, 2010:14)	Students showed a commitment with group to accomplish their goal.	124	4.59	VERY HIGH
3.	Collaboration (NEA, 2010:14)	Students were able to participate and contribute to group's work equally.	122	4.51	VERY HIGH

The questionnaire interpretation of collaboration skill consisting of only three statements fully belonged to the Very High category. It was caused by the three statements that had mean scores higher than 4.21 as the margin score to the *Very High* category. On other words, the collaboration skill concept covered 100% in the category. This condition also represented that all of the respondents strongly agreed that Project-Based Learning was effective to develop their collaboration skill during a series of speaking projects assigned to them.

d. Creativity and Innovation

Table 4.14 The Questionnaire Interpretation of Creativity and Innovation

No.	Concept	Statement	Total Score	Means	Category
1.	Creation and Innovation (NEA, 2010:25)	Students were willing to participate to offer their creative ideas for the project with the team.	114	4.22	VERY HIGH
2	Creation and Innovation (NEA, 2010:25)	Students developed their new ideas for the project.	119	4.40	VERY HIGH
3.	Creation and Innovation (NEA, 2010:25)	Students were able to assess their own ideas to improve the quality of their product.	115	4.25	VERY HIGH
4.	Creation and Innovation (NEA,	Students could implement the ideas to others effectively.	113	4.18	HIGH

	2010:25)				
5.	Creation and Innovation (NEA, 2010:25)	Students applied their creative ideas to contribute valuable work to their group.	116	4.29	VERY HIGH
6.	Creation and Innovation (NEA, 2010:25)	Students were motivated to demonstrate the originality of their product.	113	4.18	HIGH
7.	Creation and Innovation (NEA, 2010:25)	Students could view failure as an opportunity to learn.	116	4.29	VERY HIGH

From the creativity and innovation concept, it was comprised of 7 statements in the questionnaires. The results show that 5 statements presented *Very High* category and 2 statements performed *High* category. While, the other two belonged to the *High* category, namely 4.18. Provided by the percentage of 71% for the *Very High* category, this condition was valid to conclude that most respondents had perspectives that Project-Based Learning could effectively improve their creation and innovation skill during their speaking projects.

4.1.3.1 Interviews

Data from the interviews were also taken to the 27 students of the Experimental Group as the ones having a treatment with Project-Based Learning. The semi-structured interviews were prepared and the student was asked to sit face-to-face to the interviewer. They were also asked about their problems, or constraints, while conducting the experiments. The data of the interview were subsequently sorted and selected into some concepts and sub-concepts. The following is the sample of the interview results of each skill:

a. Critical thinking and Problem solving

Table 4.15 The Interview Sample of Critical Thinking and Problem Solving

Concept: Critical Thinking	**Characteristics:** **a. providing explanations and reasons**
Statement: *The obstacle that I found in this project was finding some particular components for my project. If I used a big-sized cable, I was afraid it would take time to produce heat. On the other side, if I chose the small one, it would get easier to break if it was too hot. Therefore, I needed to do continuous analyses and evaluation all the time*. (**WJ16**)	
Critical Thinking	**b. employing systems thinking (analysis, evaluation, and conclusions)**
I had to think about any possible ideas for my project many times. I was checking to see whether the device had been created or not. I was also browsing to check whether there were suitable tools for our project. Or, we would choose to use reused materials to make them cheaper in budgeting. For the innovation, we determined to use batteries, not electricity. I just hoped that we would present the most suitable and beneficial product for people with this such limited time and budget. (**ANA11**).	
Critical Thinking	**c. giving valuable opinions and make good decisions**
1. *PBL encouraged us to think critically. We thought about how to find the appropriate title for our product or what product which was suitable and beneficial for our environment related to electrical engineering. (**RS04**)* *PBL made our problem-solving skill improved. For example, we received questions from friends of the other groups related to the obstacles we had while making our product. If we chose this product, what would happen, and what problems we would face with this tool. (**AR06**)* 2. *PBL encouraged us to be more critical because we had to think and do evaluation during the making process of the products. We got some feedbacks from other teams during the presentation session. We evaluated our products, afterwards. (**EH18**)* 3. *PBL was an effective method in English learning as it did not make the lessons become monotonous for us. It was also applicable in our daily life. Since we are electrical engineering students, we are so happy to see that what we have learned and made from the lesson can be applied in our products.* (**RAA01)**	
Problem-solving	**d. solving unfamiliar problems**
1. *PBL improved our critical thinking. For example: we would like to make a circuit at that time. We browsed from internet and got the information about the procedure of making it. We*	

had made it, but it did not work. We finally asked someone else to consult with, but it was still not working. We finally decided to search another picture of circuits and did some experiments until it worked. We solved our problems. (**WK07)**
2. *PBL made us think critically. We are trained and encourage to be a critical person. We presented a product from the materials that had been taught before, we were obliged to answer questions and give a clear explanation from friends from the other groups when we were performing. On the other hand, we should have built some questions to a group presenting the product in front of the class. The audience was so critical. They also tried to give feedbacks and suggestions for the improvement of our product.* (**MU08)**

From the sample table, the students' perspectives about Project-Based Learning to promote their critical-thinking were classified into four main characteristics of critical thinking and problem solving. According to their statements, they found that the series of projects in the speaking activities had effects on developing their critical-thinking and problem-solving skill. It can be learned from their statements which implicitly and explicitly fulfilled the characteristics of critical thinking and problem solving according to the Partnership for the 21st Century Skills (P21). The activities were also challenging for them as the electrical engineering students because they were doing applicable activities in their daily routines where the basic knowledge and science were derived from the courses they acquired at school.

b. Communication

Table 4.16 The Interview Sample of Communication

Communication	**a. expressing ideas by oral, written, and nonverbal communication skills in various forms and contexts**
PjBL stimulated our communication skill. It helped us build our communication by having discussions with friends so that we could exchange our information and knowledge. (**AR07**)	
Communication	**b. sharing with others from different backgrounds (including**

	multilingual and multicultural)
PjBL increased our communication skill. Surrounded by friends from different backgrounds, different knowledge having different interpretations, we tried to share our thoughts for our teamwork. (**EH10**)	
Communication	**c. giving attention to someone else who is sharing their thought and interpreting the meanings, intentions, and messages.**
PjBL encouraged our communication skill; conveying our ideas, having a presentation, and sharing opinions, and answering the questions. (**MU10**)	
Communication	**d. using communication for any kinds of purposes (e.g. to describe, to inform, instruct, motivate, and persuade)**
PBL stimulated our communication skill: Not all of people could speak fluently in public. Even by recording our own speaking, we still made some errors. Sometimes, it made us more confused because we didn't speak correctly and we didn't really understand the materials. Therefore, I think this was important for us to encourage ourselves to be more active and attractive to speak in public and understand the materials well so that we could also engage people into our topic. For example: in presenting our product, it was important to master our own strengths and weakness, components, obstacles, to speak attractively, to use appropriate vocabulary and correct pronunciation. By doing all of these activities, we could convince the audience that our product was good. (**AM07**)	

The students' statements mentioned in the sample show how the students expressed their agreement with the good effects of Project-Based Learning in helping them communicate with others. Their statements were classified into four categories, which represents the definition of communication skills.

c. Collaboration

Table 4.17 The Interview Sample of Collaboration

Collaboration	**a. showing work responsibilities to others from different backgrounds**
Yes. PBL made our collaborative skill improved. We were building a team work which considered tolerance as the most important factor. We were trying to understand each other. We were learning to coordinate and collaborate our ideas about the concepts and materials of the project to achieve our vision and mission.	

(**WJ11**)	
Collaboration	**b. sharing the work and appreciating others' contributions**
PjBL trained collaboration and teamwork among us. We shared the work; Cahruddin was responsible for looking for the tools he got from Youtube and internet, while I was searching for the tools and equipment in the stores and markets in Mataram, Semarang. (**RS07**)	
Collaboration	**c. having a high commitment and willingness to be helpful to achieve the goal**
PjBL is effective to reduce our shyness and nervousness when we are speaking in front of class because we are forced to be accustomed to speaking in front of audience. It also encourages those who are lazy and unwilling to think or have a discussion, to be more motivated and active. I prefer to work in group as I like sharing. Besides, working in group is effective to cover each member's weakness. (**AR20**)	

Table 4.27 showed the students' perspectives about Project-Based Learning in developing students' collaboration skill were indicated by some statements implying three characteristics of collaboration skill. Their agreement about the positive effects of PJBL in increasing their collaborative skill was literally exposed.

d. Creativity and innovation

Table 4.18 The Interview Sample of Creativity and Innovation

Creation and Innovation	**a. Thinking creatively**
1. *PjBL trained us to be innovative. Firstly, we would create software glasses, but we found that the components were so difficult to find. We would need longer time to finish the work. From these considerations, we altered to find some work that offered shorter time to finish, easier components to find, and cheaper materials to buy.* (**RS08**) 2. *We thought carefully in choosing our product. We were browsing to see if the*	

product was suitable for us or not, if the materials could be found in Semarang or not. We finally decided to develop the product by using batteries instead of electricity. **(ANA11)** 3. We *employed our creativity and innovation in creating our product, though the product was not completely new. We could develop our ideas about products that had ever been produced or develop the products that had been produced before. We should also think whether the idea was possible to realize or not, with such limited time, whether we could find the components and materials easily in Semarang or Indonesia. There were many considerations we took before we determined to choose one product.* **(RAA15)** 4. *Before creating the product, we would like to make a device to anticipate detergent-waste usually found in the river. I had already got the concept, but I had not prepared the materials as I had not time for it.* **(AM16)**
Creation and Innovation | **b. Work creatively**
1. *We decided to develop the existing products. We learned about what became the strong points of the product. We checked whether the products had ever been made before or not, so there would be no one claimed us. We adopted the idea, we improve it, and we developed it.* (**RAA16)** *2. We learned from the errors and mistakes. If we made mistakes in designing our product, we evaluated and repeated to make it again. We might have felt desperate and failed, but we were committed to accomplish our target.* (**ARR11**)
Creation and Innovation | **c. Implement innovation**
1. *We actually had innovative ideas, but we just could not apply them in our daily life. By having PJBL, we had a chance to explore our ideas on our products.* (**ARR9**) 2. *PJBL could improve our innovation skill. All ideas we had were poured in these activities. We discussed what should be developed and what should be evaluated.* (**EH12**) 3. *Because of PJBL, we were helped to be more creative and innovative. Because there is an institution in this campus which encourages students' creativity and innovation, named PKM. Even my group has got some ideas for PKM (Program of Students' Creativity), and we are optimistic with the ideas to be proposed.* (**WK28**)

The sample of the interview represented the students' experiences in implementing Project-Based Learning in developing their creativity and innovation skill. Based on the result, the students showed their enthusiasm since the PjBL was approved to have made their creativity and innovation skill developed.

4.2 DISCUSSION

The main purposes of this study are to ascertain the effect of using PjBL in enhancing the students' speaking skills and developing their Four Cs. In order to achieve such objectives, the results in the form of data are associated with to the review of literature.

4.2.1 The Effectiveness of PjBL in Enhancing the Students' Speaking Skills

The results of the speaking test show that the two groups experienced a better achievement during their learning process. However, the experimental group which received PjBL treatment got much better result compared to the control group which did not receive PjBL treatment. Based on the the pre-test results, it shows that students mostly found difficulty in most linguistics aspects. Comprehension is their hardest work, followed by grammar, vocabulary, fluency, and pronunciation. The students also showed their anxiety and fear while speaking which hindered their speaking fluency. However, after the continuous stimulation and lots of practice through PjBL, the students showed good progress in their speaking skills. The significant improvement was also absolutely affected by their full participation in the series of projects. It implies that the students themselves

enjoyed the activities so that were motivated to complete the work. They also looked more relaxed when speaking in front of the class even though they needed to make some preparation by memorizing some vocabulary and steps of a presentation before their presentations.

The significant result shown in this study is in line with a study conducted by Molina and Cardona (2017) who implemented PjBL to non-English students in the bachelor degree program. Using action research, they also gave a series of projects dealing with digital and technology categorized into product and performance projects, such as film-making, digital storytelling, podcast like a mini-radio program. From the results, it appears that Molina and Cardona only observed on the linguistics features even though their study used end products employing skills and team work. This was definitely different from this research which covered more comprehensive discussion, about speaking and some other skill features that were involved during in the studies, namely the Four Cs. In this research, the projects, such as the concept presentation, the product presentation, the video tutorial and video campaign making, and a poster making, allowed the students to interact and discuss what they had in their minds in English. The students not only presented their concepts and products into the presentations leading them to question and answer sessions in the classroom, but the students also had some discussions in English outside the classroom such as the discussion of their product, the making process of video-tutorial and video-campaign, since the teacher required them to record their discussion moments.

Based on the satisfactory outcomes, it is seen that speaking skills can work better for some factors. As stated by Krashen there are three factors mostly affecting the success in learning languages: motivation, self-confidence, and anxiety (1982:31). It means that if someone has intrinsic motivation, he/ she will do the activities happily, engage with the work without pressures, and have a strong determination to accomplish without caring any external rewards. One master thesis discussing speaking and motivation through PjBL was conducted by Pratiwi (2016). By using a play to teach narrative text, she claimed that PjBL could highly improve her students speaking skill and motivation on junior high.

Besides motivation, Krashen also states that the successfulness of cognitive and affective activities cannot be achieved without the level of confidence and self-esteem. According to Brown (2000), self-esteem is an individual assessment towards how he or she regards himself/ herself, expressing an attitude of approval or disapproval and indicating the extent to which he/ she believes himself/ herself to be capable, significant, successful, and worthy. Based on the theories, self-confidence extremely gives a clear meaning that when someone thinks that he/ she can use a language, he/ she will be more motivated to learn.

From the students' attitudes during their speaking performances, they gradually increased their self-confidence. From the answer of the questionnaires, the students also approved that PjBL could elevate their confidence while speaking English. PjBL gave the students' opportunities to lead themselves to speak in front of others that made them felt important, valued, and appreciated.

The students also felt comfortable and less worried, so they would feel free to express what they had in their mind to their oral communication. This is highly correlated with Krashen that anxiety prevents language acquisition and asks the teacher to overcome it. In this study, the teacher reduced the students' anxiety by not giving too much correction and controls during the classroom activities.

The condition where the teacher was not a superior in the classroom brought a comfortable atmosphere which made the students feel free to get more involved during the projects: presentations, video makings, and poster makings. This engagement was shown by their willingness to do the work in their boarding house in spite of no teacher supervision around them, their attentiveness during their friends' presentation, their enthusiasm in asking and giving feedbacks and criticism, their maximum effort in discussing and creating the best products. They would also be more open to pour their genuine ideas into their projects. They were also more attracted to create the best projects they could. By this comfortable condition, they felt challenged so that they enjoyed the activities. The teacher did not need to remind them of the work very often, yet the students knew their own responsibilities.

The results from the speaking questionnaire also revealed that Project-Based Learning could assist students to improve the students' speaking skills which covered the speaking aspects, motivation, engagement, autonomy, confidence, and pleasure. It is indicated by the two dominating categories appearing in the results, the *Very High* and *High* category, concluding that most students have strong agreement towards the implementation of PjBL for their

speaking practice. For example: one opinion was expressed by a student when expressing his feeling of his favorite product. He was a member of the Safe Mosquito Repellent Team, saying that making a campaign-video gave him such a joyful experience. Related to this, there are four typical of work and activities to explore when executing PjBL: (1) activities representing some ideas or plans, (2) work activities consisting of enjoyable esthetic experience, (3) work activities offering problem-solving, and (4) work activities including obtaining certain skills or knowledge (Kilpatrick, 1918; Pecore, 2015). From the student' statement, it actually revealed the four types of projects in his product since the campaign-video making as his favorite activity represented his team's ideas and plans from the type 1. It also made the students face some problems that required to be solved representing type 3. Furthermore, the students also needed to learn new skills such as how to make video, how to edit, how to give some features in the video, etc., representing type 4. Finally, the activity of the campaign-video making provided fun for the students representing type 2. From the students' experiences, projects were viewed to relate the students' interests. Besides, those types of work could really help students explore and learn many aspects of life.

The project work was considered to be a trigger for the students to speak up more frequently. This condition is basically supported by a theory from Grant (2002) that PjBL is an active learning process which puts the students into the center of the activities. Agreed by Kafai and Resnick (1996), they say that students can present what they have learned through some real projects: plays, multimedia presentations, poems. Those activities are in line with the Brown's

concept (2003) that activities like storytelling, discussion, question and answer are good at making the students' speaking skills better. From the explanations, it can be said that by applying PjBL, the students are given more opportunities to use their language practice in English in class since they are the subject of the learning activity, not the teacher, so that they are allowed to explore their skills through the activities. In this research, the projects, such as the concept presentation, the product presentation, the video tutorial and video campaign making, and a poster making, allowed the students to interact and discuss what they had in their minds in English. The students not only presented their concepts and products into the presentations leading them to the question and answer sessions in the classroom, but the students also had some English discussions in outside the classroom such as the discussion of their product, the making process of video-tutorial and video-campaign, since the teacher required them to record their discussion moments. Those activities would also stimulate students to use speaking activities, such as asking, responding, persuading, praising, and so on, which then enriched their vocabulary and improved their speaking aspects. The frequency and the consistency of the speaking activities were simultaneously easier to make their speaking performances better day by day. Related to this, Yiying (2015) took 10 weeks to implement PjBL for a series of projects: project proposals, presentations, and survey designs and sheets for her students. She believed that allowing more activities for students to do some work would enable them to practice their language. This research also took a periode of time. Spending six weeks to

perform PjBL for practicing speaking, the students seemed enthusiastic to wait for their own and other team presentation.

The enthusasism of the students was also shown during the interviews. From the results of the interview, most students confirmed that PjBL gave positive impacts in their speaking performance. For example, PjBL was able to overcome the students' confidence problem. It is learned that the student used to be not confident to speak up in English. He felt not confident if he could not speak in a natural way, use bad pronunciation, produce incorrect grammar, or even do not know what to say for lack of vocabulary. Because of these conditions, he chose to avoid any English speaking activities or remain silent during the classroom activities. The problems mentioned above are relevant to the statement of Haidara (2016) stating that one psychological barrier in speaking English is lack of confidence because students always think about how to use correct pronunciation and grammar. The condition causes the students assume that speaking English is never easy. However, PjBL offers a solution since it facilitates self-correction and peer-correction so that there are no superiors and inferiors in the classroom, and this idea is approved by Zare-Behtash and Sarlak (2017). They say that each student can learn from peers that this activity can make their less anxious. In this study, the students willingly shared their knowledge related to speaking, vocabulary, or pronuntiation for giving their best in reaching their work goal. Even the teacher did not give too much correction, but feedback. The students also learned to to correct themselves. This class atmosphere definitely made students feel more comfortable and increased their confidence.

Another psychological factor affecting the speaking ability which was mentioned by the students was shyness. Shyness and lack of confidence are closely related since one influences the other factor. When someone feels shy, he/ she will not be able to express the ideas and thought to other people since he/she does not enough courage. Therefore, teachers play important roles to create a situation which provides students free-anxiety in the form of autonomy. PjBL offers autonomy and self-centeredness since the teachers do not perform as the rulers but the facilitators in this method. According to Harmer (2001) project work allows the teachers to be a participant as well. It means the teachers can get involved in any communicative tasks, such as the participant during the presentation so that they can ask the students about the products. However, the teachers give the students more opportunities to discuss any topics and problems with their peers and groups first before the teachers give the feedback. By this condition, the students will be more active and willing to speak up to peers in the classroom activities.

Motivation was again mentioned by the students during the interview. In this study, the students said that they believed and realized that intrinsic motivation was the main factor of his success. Intrinsic motivation basically happens when one activity is done for the inherent satisfaction of the activity itself. Intrinsic motivation needs some supportive conditions: feelings of autonomy, relatedness, and competence, accompanied by a sense of interest and value (Ryan and Deci:2000). For this perspective, it shows that the student was

aware of his willingness as the determining factor of success that made himself easy to encourage himself to succeed instead of someone else.

However, extrinsic motivation was also indirectly shown in this research. The extrinsic motivation was basically demonstrated by the teachers' roles during the classroom activities. By saying that the teacher was guiding them, it can be concluded that the teacher did not control them. Yet, the teacher gave them autonomy to accomplish the work. By giving autonomy, the teacher also encouraged the students' self-centeredness so that they did not depend on the teacher for the sources, but they explored the sources themselves. This is relevant to Weimer's opinion about constructivism that students do not need to wait until they are skilled. Yet, they should be stimulated to explore, to handle, and to relate the content to their own life experience and challenge it (Weimer, 2002:13). Even though they still find problems here and there and do not much knowledge about it, but the students will have tried to learn since the goal of learning is to involve the students in searching and storing information. This illustration shows centered-learning which highlights self-centeredness, and PjBL is such an appropriate way to support centered-learning.

Related to the language aspects, the students exposed several projects that needed preparations in English. It means that the student should have learned what they needed to say in the presentation. The students realized that they were indirectly urged to learn and practice speaking so that they finally could present well in front of class. This is relevant to Saville-Troike (2006) claiming that the success of language learning is highly influenced by social experience: the quality

and quality of input and interaction. It means that the more the students get opportunity to be exposed with the target language input and output in the form of interaction, the more the students can achieve the target of learning. PjBL is a teaching method which gives students more opportunity to practice inside and outside the classroom since it emphasizes on the real-life activities. It does not merely give drilling and grammar focus, but it offers more comprehensive language aspects.

Lastly, the result of the interview also revealed that after conducting a series work, the students were aware of the needs of English in this digital and technology era. The student thought that having English speaking in this era was crucial since communicative competence was needed in any situation.

4.2.2 The Effectiveness of PjBL in Developing the Four Cs through the Speaking Projects

To answer the second question of this research, questionnaires, interviews, and observation were conducted. Theories are also used to support the field results.

Like the results of the speaking questionnaires, the Four Cs questionnaires also presented two dominating categories, namely the *Very High* category and *High* category. Surprisingly, these two dominating categories went to each element of the Four cs. It indicates that that most students strongly agreed and agreed that PjBL could develop their Four Cs.

The result of the questionnaire confirmed that PjBL encouraged the students' critical thinking and problem solving. It was indicated by 91 %

respondents strongly agreed the positive impacts of PjBL in increasing their critical thinking and problem solving. These enthusiastic responses appeared since the respondents were allowed to learn new things and update information and arguments which could support their projects from any references and peers. The respondents also felt that they were also trained to be fair and broad-minded when receiving any opinions from others. This could be done by not only accepting any information, but also selecting, summarizing, distinguishing, and crosschecking whether the information was valid or not by surfing in internet, Youtube or reading some books and articles. By learning from some references, the students were expected to know well about the strengths and weaknesses of their products. PjBL also helped the students learn to solve the appearing problems during their projects. By anticipating and finding a solution of problems they faced, the students were stimulated to give reasons and draw conclusions for why and how questions. This was represented in the question and answer session. In this session, a group of students must be able to defend their arguments about their products, accompanied by their reasoning when the other group tried to criticize or give arguments towards their products. From the whole results, the respondents felt the positive impacts of projects work of speaking which could foster their critical thinking and problem solving.

The positive outcomes for critical thinking development in a language classroom were also confirmed by Handhika et al. (2018) after their research on their students of physics education program. Capraro, Capraro, and Morgan

(2313:2) also supported that projects in PjBL push students to use their analytical skills.

The results of the questionnaires related to the communication skills showed that PjBL effectively enhanced their communicative skills, shown by 60% students strongly agreed with the idea. In this research, these were demonstrated by the students' abilities to deliver arguments and opinions in the form of speaking, writing, and use of nonverbal communication skills during the presentations, discussions, and question and answer sessions, to utilize themselves with multimedia and technologies, which was shown by the students' ability to use *power point* during presentation, to use software and application to create discussion, campaign, and tutorial videos, to use *Photoshop* and *Corel draw* software to design posters, to communicate with others from different cultural, mother language, and school backgrounds, to welcome ideas and thoughts from others coming from different origins, school backgrounds, mother languages, etc. This is in accordance with Kovalyova, Soboleva, Kerimkulov (2016) whose research result shows that PjBL could increase their students' communication skills: speaking, writing, reading, and writing. It proves that PjBL was able to give better performance for those integrated skills. The students recommended using PjBL for next interdisciplinary subjects in EFL classrooms.

Communication skills are skills which are regarded as critical skills in the workplace of this era since relationships between customers and employees will work well if each has communication skills. The ability of linguistic form uses, language functions, and effective listening will support the performance the

economy. In this study, the students applied some communication functions such as persuading audience while campaigning their products, and instructing, negotiating, explaining, and describing things in the presentations. In this regard, Hymes (1972) argues that developing communicative competence is the main goal of language education. It means that learning knowledge of linguistic forms is not sufficient to support students to achieve his communication competence. Students are suggested not only learning grammar, linguistic features, and some other cognitive elements but also giving such a performance. It can be concluded that learning a language is not merely about patterns or formulas, but it is about how students can employ the language in an appropriate situation through daily practices.

For the questionnaires related to collaboration skills, this study claimed that PjBL definitey enhanced the students in collaborative skills, shown by 100% students strongly agreed with the idea. Collaboration will work effectively if good communication is built among team members. It can be said that the relationship between communication and collaboration is highly closed. Each member in the group expresses his/ her ideas and thoughts by brainstorming, sharing, listening, negotiating as the realization of communication so that it enables the group to work together to eventually achieve the goals. This illustration strengthens an idiom “Two heads are better than one” meaning that when two people work together, they are more likely to solve a problem than one person doing it alone. Besides, collaborative work gives positive effects in improving intrinsic motivation, increasing persistence of the team members when encountered

difficulties, and providing more opportunity of knowledge and skill sharing (Ptaff and Huddleston:2003). Thus, students who are equipped with good communication skills, problem-solving skills, and effective teamwork among members will be valuable assets for future employers. In this study, students learned to compromise, share the work and responsibilities, appreciate someone else's ideas and contribution during the project making. They agreed to allocate their time to have discussion with their friends and do the work. They even conducted the experiments until late at night. Each team tried to share responsibilities, such Besides, most previous studies used in this research also proposed that PjBL could highly develop students' collaboration skills (Musa et al., 2011; Kapusuz and Can, 2014, Efstratia, 2014; Kovalyova, Soboleva, Kerimkulov, 2016; Astawa, Artini, and Nitiasih, 2017;)).

The questionnaires related to the creativity and innovation, 71% respondents strongly gave positive responses that the speaking projects stimulated them to think and innovate in creative ways. PjBL offered more opportunities for the students to freely create and innovate products from problems or conditions coming from their surroundings. For example: the Safe Mosquito Repellent Team was inspired by the daily conditions of students. Staying in the boarding houses near campus made them always face a common problem, namely mosquitos. Learning from the uncomfortable experience with mosquitos, the group created and designed an economical handy tool to get rid of mosquitos. In this product, they used recycled cigarette cans and preferred to apply battery power for the energy to avoid electricity as one of non-reusable resource. From the illustration,

it can be seen that the students tried to innovate something based on the condition in their surroundings. The similar product may have ever been found in the market, but the group tried to give some solutions for those who wanted to have the cheaper and safer mosquito repellent product. This kind of innovation will be beneficial in the future since people will need alternatives for solving their problems. This is in line with Sternberg (2007) that successful individuals are ones providing themselves with creative skills to give a vision to support their intention for contributing benefits of human civilization.

Lastly, from the answers of the interview related to the Four Cs for the 21st century skills, the respondents showed strong agreement, optimism, and good perspectives that PjBL was a suitable method to teach them the required skills in this era. They felt that they were like applying what they learned in their electrical-related subjects so that making the projects in English class was their application moment. The difference was only the language used during the activities where in these projects were all speaking in English. With these kinds of experiences, some of the respondents were triggered to join *PKM (Program Kreativitas Mahasiswa)*, as one unit in campus where the students can propose the ideas for innovation. The experiences have obviously built their self-confidence and self-esteem in creating and innovating. To sum up, PjBL does not only support the students in the academic courses or subjects in the classroom, but also motivate and invite the students to give some more advantageous contribution to the real life world.

4.3 The Implementation of Project-Based Learning through the Speaking Projects

There was a series of projects conducted by the students of the experimental group. There were three questions designing problems which were prepared and agreed by the teachers and the students needed to be answered and solved: (1). What can you do to save the environment?, (2). How do you make it?, (3). How can people know your product and how do you convince them about the benefits of your product?

To complete the projects, the students were divided into six groups. The students were allowed to select the members of their team. Meanwhile, the projects were accordingly divided into four main assignments: (1) presentation of product concepts, (2) presentation of products (accompanied by the video-tutorials), (3) uploading the campaign-videos on Facebook, (4) presentation of posters. However, the students were asked to record their English discussion with their groups into videos. The detailed of the implementation of each project is described as follows:

a. The discussion Videos

The video showed a moment where the students were discussing what products they wanted to make with their friends. This video was collected per group. Therefore, the settings of the video were different each other. Some were conducted in their room of the boarding house and some were done at campus. In this video, the students, one by one, mentioned the product they wanted they thought was good accompanied by the reasons

of choosing it. Some students would agree or disagree with their fiends' choice and gave some alternatives accompanied by their reasons and feedback. The students were discussing until they finally found the product they liked.

b. The Presentations of the Product Concept

The purpose of this presentation is to share the plans and the concepts of one group to the audience. In this presentation, each group showed the name of the products, the reason for choosing the product, the required materials and tools, the designs, and the making process of the product. From the products, there were some products which needed to be revised or disqualified, for example: The Hazard Glasses and The Automatic Sensory Door. These products needed high budget for they would use sensors and took time in the making process. Therefore, the products were disqualified and the group changed their product to another product. This decision was made by the teacher based on the result of discussion among the groups.

c. The Presentations of the Real Products

In this presentation, each group showed their products as the implementation of the concept they had in the previous meeting. Besides showing the products, they accompanied their presentation with the video-tutorial of the product making. In this presentation, there were some products successfully accomplished, such as The Clap Switch, The

Muffler Handphone Charger, The Fertility Soil Tester, The Mosquito Battery Repellant, The Plastic Wind Power Plant, and The Bottle Cleaner. In these projects, the groups had purposes to give their benefits to the people using their products. The Clap Switch, for example, a product whose facilities are dedicated for the disabled, offers a special quality for the disabled, especially the blind people. Using this device, they do not have to reach the switch whenever they want to turn on/ off the lamp. They just need to clap their hands, and the lamp will be on or off by itself as the inserted sensor. The device is definitely helpful and practical to the disabled.

To start working the products, the students firstly started their research by searching any information from internet and media. They also conducted an investigation about the ideas related to the products they were going to make whether the product had ever been produced before or not as they needed to learn, develop, and improve the existing products. In the process of the information searching and investigation, the students were applying some of the critical thinking criteria, namely making judgements and decisions which were shown by analyzing, evaluating information, arguments, and beliefs. From the information and investigation, the students interpreted and analyzed the information, then sorted and selected the most representative product according to them. After this process, they drew conclusions and finally formulated and decided the products they would chose for the presentation. During this

activity, the students were using their reasoning about why they agreed to choose the product and how would they implemented it in the next step. For instance: The Muffler Cellular Phone Charger is a device used to charge a cellular phone which is supported by heat produced by a motorcycle muffler while the motorcycle is working during a trip. This device is claimed to be so economical and practical since the rider can ride the motorcycle while charging. The heat of the muffler is able to be transferred into a useful purpose. Before the process of making, they were searching information via internet about the product they might be making. Besides, they were doing an investigation to see if the product had ever been made. The students firstly confirmed that it was a new product. However, the students found the recent proposal that this product had been proposed by Gajah Mada State University students. Considering that the students just found the information, the teacher did not matter with this as the group did not know it. The teacher instead appreciated this product making as considered to be very complicated as the students needed to reach a certain heat level so that the device could be used to charge. The group needed to do several experiments to achieve the exact heat so that the device was effectively used.

The next project was The Fertility Soil Tester. The group was inspired by their activities every weekend in the dorm, namely gardening. As the members of the dormitory around the campus, they are asked to plant and consume vegetable and fruit harvested from the dormitory

garden. The group found that if they could see the level of the fertility of the soil, they were able to maximize the result of the harvest. The device looked interesting as the group brought samples of soil in the classroom. In front of their friends, they stuck the device to each sample of the soil. If the soil was fertile, the lamp was on. On the other hand, if the lamp was dim. It means the soil was not really fertile. This experiment definitely needed some experiments and some research so that it could provide scientific outcomes in the future.

The Mosquito Battery Repellent Team was inspired by the electrical mosquito repellent. In this product, the group wanted to offer another alternative by giving a more economical and safer mosquito repellant. By using batteries, this product was considered to be safer to the environment as they do not consume electricity power. For the materials, the group members chose to use reused cigarette cans and some other metals as the perfume container. They soldered the cans so that the cans could be stuck and shaped into a type of shape they wanted. They painted it so that it looked chic. From here, it can be seen that the students did the work seriously from planning, designing, and constructing the product until the product could function well.

The next project was The Plastic Bottle Power Plant, which was created to provide electrical power adopting the wind mill power plant. This was inspired by a condition where there were so many plastic bottles found and left unused so that they would be harmful as plastic materials

cannot be resolved by soil for years. By finding this tool, the group hoped that their tool could save the environment as it could exchange the non-reusable power plant which was highly consumed by people to a new resource.

The Bottle Cleaner was the last product. The product was a kind of innovation from a baby bottle cleaner. Yet, it needed batteries to make it work. With this tool, the user did not need to stir the tool to clean the bottle, but she/ he only needed to turn the switch to make it work.

d. The Videos of Product Making

The video tutorials were created and inserted by the students to accompany the product presentation. It means when the group presented the description, the materials, the components of their product, the group also showed the audience the making process of the product. From the videos, the audience could see the details of the process so that they could give feedback for the improvement. In the video, the group was describing the process in English while making and arranging the components. The videos contained the process making of the product and describe step by step of procedure. These video tutorials were actually the core of the topic of the learning since the topic of the lesson was describing processes. In making the videos, it did not only emphasize the language feature, but also force them to choose the best video application. By using the best video application, they could edit, insert voices, and put some music background so that the video looked interesting.

e. The Videos of Product Campaign

The campaign videos were made after the product presentation. The purpose of the videos was to publish and market the products to public. In this video, the students tried to invite and convince the audience about the benefits of their products so that the audience was interested in checking or asking or buying the product. After the video had been edited and been ready, the videos were uploaded to Facebook which was a tool to reach people. To arrange the videos, there must be some preparation since the students would use some language purposes, such as greeting, inviting, persuading, and closing, that would also attract the audience to stay tune to see the videos. The students also needed to apply an application to make their videos good so that they could be edited and inserted with their voices.

f. The Presentations of Posters

The poster presentation was the last project conducted by the students. In this phase, the students created and designed the poster of the product. They needed to write the title, the components, the use of the product, and the making process of the product. All of them were written in short since they needed to put some photos of the steps of the making. After having finished the poster, some of them consulted the results to the teacher to ask some feedback before the poster was printed. The last step was presenting it in front of their friends and attached it on the wall magazine. In designing the videos, the students would also need to use some software,

such as *Photoshop, Corel draw*, etc. Therefore, for the students who had not known how to use it, they needed to learn it. They needed to learn how to design, how to give colors and how to combine them, etc. This project automatically taught the students new things. This is relevant with Thomas (2000) that one characteristic of PjBL is to make students learn new things.

4.4 The Strengths and Weaknesses of PjBL in Enhancing the Students' Speaking Skills and Four Cs through the Speaking Projects

In the process of the implementation of PjBL through the speaking projects for teaching describing a process conducted by the Experimental Group in the form of discussion, video making, concept presentation, product presentation, campaign-video making, tutorial-video making, and poster making, there were some positive and negative points learned.

Most positive impacts of PjBL have been exposed in the discussion. However, one which can be emphasized here is that PjBL had such a special connection to the electrical engineering students. The electrical engineering students basically love practical learning rather than theoretical learning, meaning that this activity excited them better. The topic of the project was also related to their daily subjects they learned at school so that conducting the projects were like implementing some of lessons they learned from the other academic courses.

Besides applying the lessons to action learning or practice, Project-Based learning is a process and product oriented projects. The students learned new skills during the project making, such as operating *Photoshop* and *Correl Draw*, operating a video recorder, using some video applications which automatically gave special experiences for the students which would be valuable in their future life.

Besides the Four Cs, they also learned leadership, time management, budget-management, discipline, independence, which also include in work ethics, which can build them positive characters in facing their future work. PjBL was conducted in a series of work taking a period of time rather than short time which gave the students time to practice their language learning more frequently. This condition led to the students' accuracy and fluency in language learning.

PjBL is likely good to be implemented in the ESP (English for Specific Purposes) classes as it commonly emphasizes content learning and language input and skills through practice rather than learning through theories.

However, some weaknesses of the implementation of the PjBL through the speaking projects were also revealed. Conducting a series of projects with several products took a lot of time. The students needed to allocate their time to meet their peers to discuss their projects or do the experiments, competing with many other assignments they had from other subjects. PjBL in this research spent two months in total. The students also took a lot of energy since they needed to work late at night or morning to study the references, discuss with friends, and do the

experiments. They also needed to allocate some money to buy the components or materials of the devices or print the posters. However, the students worked in groups so that they could share the budgets. The big efforts were also made by the teacher. To guide and facilitate the students during the projects, the teacher should be available any time in case the students needed some consultations via texts or meetings. The teacher should be active in checking the students' work and giving some evaluations continuously so that all the work could be implemented in the precise time. It needs such a skillful dedicated creative patient teacher to finally succeed this kind of work, so this method is usually marginalized by language teachers. Besides following the syllabus, the teacher should be able to know her students' interests, needs, and capabilities so that it would be easier for her to create and design the teaching and learning process and collaborate with the students. Even though the products were successfully completed and the students did not complain, high commitment to the teamwork still needs to be improved to anticipate unfair teamwork participation.

CHAPTER V
CONCLUSION AND SUGGESTION

This chapter presents the results and conclusion, and suggestions. The conclusion summarizes the results and the findings mentioned in the previous chapter. The pedagogical implications present significant views of the teacher's beliefs as the implications in teaching and learning language. The suggestions are recommendation or advice related to the further study with the relevant field or topic dedicated for the teachers, the students, and the next researchers.

5.1 CONCLUSION

Project-Based Learning is an interesting, empowering, and fun method which can be an alternative to stimulate students to enhance their speaking skill. This method is also possible to encourage some other variables: the "Four Cs" namely critical thinking and problem solving, communication, collaboration, and creativity and innovation. According to the results of the research conducted towards the Experimental Group and the Control Group, it is proved that Project-Based Learning is effective to improve the speaking skill and the "Four Cs" through a series of speaking projects. Shown by Independent Sample T-test, the mean scores of the Control Group was 8.08 and the Experimental Group was 8.74. After a treatment by using Project-Based Learning, the Experimental Group showed highly improvement with the mean score of 15.33. While the Control Group that was not taught by using Project-Based Learning showed the mean score of 11.62. From the comparison of the mean scores before and after the treatment, it can be

seen that the Experimental Group was much higher than the Control Group. Supported by the significance value which was below 0.05 of the Levene's Test, it presents that the mean scores of the Experimental Group and the Control Group were significantly different. It means that PjBL was effective to enhance the students' speaking skills of the Experimental Group. Besides, the questionnaires and the interview results showed that the students felt positive impacts of PjBL in helping them learning speaking. The results of the questionnaires and interviews also demonstrated that PjBL was effective to develop the students' Four Cs. It is shown by the most dominating categories appearing in the results of questionnaires, namely the Very High category representing that most students strongly agreed with the statement, and the High Category representing that most students agreed with the statement. From the interviews the students showed perspectives and attitudes that PjBL gave them values of learning since they could apply their knowledge into their daily routines, express their thoughts and ideas, collaborate with peers and groups, and explore their ideas to create and innovate. The students also felt enthusiastic, fun, and challenged even though they had to study hard, to work hard, and to budget thoroughly. From the projects, the students learned work ethics, discipline, self-management, and budgeting management besides learning some other new skills such as planning and designing by using software and applications.

Learning the positive effects of PjBL in the teaching and learning process, this method is recommended to those English teachers, especially those who handle STEM (Science, Technology, Engineering, and Math) classes since these

classes usually perform practice so that the students can apply their speaking and their knowledge simultaneously. PjBL provides autonomy, student-centered learning, and deep learning. The students do not only learn something from imitating or memorizing, but they emphasize comprehensive input. PjBL gives the students benefits as what they learn in English class is related to what they learn in their STEM subjects. This condition can prepare them to the future since they deal with the real world.

5.2 SUGGESTIONS

Based on the teaching and learning processes happening during the research, some suggestions are proposed as follows:

a. For Teachers

It is important for teachers to have a variety of teaching methods. For those teaching engineering students, it is suggested teaching the students with a method enables them to practice the knowledge and prioritize deep learning rather the surface learning so that the students will obtain optimize their comprehension. This practice is also one way to prepare the students to face the real world which demands them to be skillful. PjBL is one of the methods can be used for teaching the students especially speaking since it can motivate and stimulate them to explore their ideas without making them feel inferior and shy as it proposes collaborative learning. To support this method, teachers should act as facilitators and monitors and avoid being controllers. This effort is expected to make the

students feel responsible for their own work. Instead, teachers can be the participants during the classroom activities with less involvement. However, it needs trust which should strongly built between the teacher and the students so that their teaching and learning goal are achieved. The students will realize that they do not only learn for scores, but they learn for knowledge, values, and thoughts which are meaningful for their own present and future life.

b. For the Students

Project-Based Learning is a method which needs hard work for the students since they explore their ideas and thoughts and construct their knowledge through information they get from any sources without the teachers' help. The students should learn seriously and be prepared for any performances. The students usually have a problem in vocabulary where they usually forget the words. Therefore, some practice before the presentation is necessary to give their best performance.

c. For the Next Researchers

Even though the success was shown in this study, this study is far from being perfect. Weaknesses are still found. In this study, the researcher limits the study only on her class of the electrical engineering students. Therefore, the findings and the results of the study should not be generalized to all population. It is caused that it needed time to do some observations before conducting this research so that it is important to truly understand what the students needed in their English class

at that time and the demands of the 21st century. This study is conducted in the ESP class which may give different results from those conducted to regular classes. Therefore, there are many things which can still be explored in the future research.

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Appendix 1

The Result of Pre-Test and Post-Test

A. Pre-test Result of Control Group (CLASS A)

No.	Name	Fluency	Pronunciation	Grammar	Vocabulary	Comprehension	Total
1	S1	1	1	1	1	1	5
2	S2	1	2	1	1	1	6
3	S3	1	1	1	1	1	5
4	S4	2	2	2	2	2	10
5	S5	1	1	1	1	1	5
6	S6	1	1	1	1	1	5
7	S7	1	1	1	1	1	5
8	S8	1	1	1	1	1	5
9	S9	1	1	1	1	1	5
10	S10	2	2	2	2	2	10
11	S11	2	2	2	2	2	10
12	S12	2	2	2	1	1	8
13	S13	3	3	3	3	2	14
14	S14	1	2	1	1	1	6
15	S15	1	1	1	1	1	5
16	S16	1	2	1	2	1	7
17	S17	2	2	2	2	1	9
18	S18	1	2	1	1	1	6
19	S19	1	1	1	1	1	5
20	S20	3	2	2	2	3	12
21	S21	2	2	2	2	2	10
22	S22	1	2	1	1	1	6
23	S23	1	1	1	1	1	5
24	S24	1	1	1	1	1	5
25	S25	2	2	2	2	1	9
26	S26	1	2	1	2	1	7

B. Pre-test of Experiment Group (CLASS B)

No.	Name	Fluency	Pronunciation	Grammar	Vocabulary	Comprehension	Total
1	S1	2	2	1	2	2	9
2	S2	2	2	2	2	2	10
3	S3	2	2	2	1	1	8
4	S4	1	2	1	1	1	6
5	S5	1	1	1	1	1	5
6	S6	2	2	2	2	2	10
7	S7	1	2	1	1	2	7
8	S8	3	3	3	3	2	14
9	S9	2	2	1	1	1	7
10	S10	2	2	2	2	2	10
11	S11	2	3	2	3	2	12
12	S12	2	2	1	1	1	7
13	S13	1	1	1	1	1	5
14	S14	2	2	1	2	1	8
15	S15	1	1	1	1	1	5
16	S16	2	2	2	2	2	10
17	S17	3	2	2	2	2	11
18	S18	2	2	2	2	1	9
19	S19	2	2	2	2	1	9
20	S20	1	1	1	1	1	5
21	S21	2	2	2	2	2	10
22	S22	2	2	2	2	2	10
23	S23	2	2	2	2	2	10
24	S24	1	2	1	1	1	6
25	S25	2	2	1	2	1	8
26	S26	3	3	3	3	2	14
27	S27	3	2	2	2	2	11

C. Post-test Result of Control Group (CLASS A)

No.	Name	Fluency	Pronunciation	Grammar	Vocabulary	Comprehension	Total
1	S1	2	2	2	2	2	10
2	S2	3	3	3	3	2	14
3	S3	2	2	3	3	2	12
4	S4	3	3	3	3	3	15
5	S5	2	2	2	3	2	11
6	S6	2	2	2	2	2	10
7	S7	2	2	2	2	2	10
8	S8	2	2	2	2	2	10
9	S9	1	1	1	2	1	6
10	S10	3	3	3	3	2	14
11	S11	4	4	4	4	3	19
12	S12	2	2	2	3	2	11
13	S13	3	3	3	3	3	15
14	S14	2	2	2	2	1	9
15	S15	2	2	2	2	2	10
16	S16	2	3	3	3	2	13
17	S17	2	2	2	2	1	9
18	S18	2	2	2	2	1	9
19	S19	1	2	1	1	1	6
20	S20	4	4	4	4	3	19
21	S21	3	4	3	4	3	17
22	S22	2	2	3	3	2	12
23	S23	1	1	2	2	1	7
24	S24	2	1	2	2	1	8
25	S25	3	2	3	3	2	13
26	S26	3	2	3	3	2	13

D. Post-test Result of Experiment Group (CLASS B)

No.	Name	Fluency	Pronunciation	Grammar	Vocabulary	Comprehension	Total
1	S1	3	3	4	4	2	16
2	S2	3	3	3	3	3	15
3	S3	2	2	2	2	2	10
4	S4	2	2	3	3	2	12
5	S5	2	2	2	2	2	10
6	S6	3	4	4	4	3	18
7	S7	3	3	3	4	3	16
8	S8	3	4	4	4	3	18
9	S9	3	2	3	3	2	13
10	S10	2	2	3	3	2	12
11	S11	3	2	3	3	2	13
12	S12	2	2	2	3	2	11
13	S13	3	3	3	3	2	14
14	S14	3	3	3	4	3	16
15	S15	3	3	3	3	3	15
16	S16	4	3	4	4	3	18
17	S17	2	2	2	3	2	11
18	S18	3	3	4	4	3	17
19	S19	4	3	4	4	3	18
20	S20	2	2	2	3	2	11
21	S21	3	3	4	4	3	16
22	S22	4	3	4	4	3	18
23	S23	4	4	3	4	3	18
24	S24	3	3	3	4	3	16
25	S25	3	3	3	3	3	15
26	S26	4	4	4	4	3	19
27	S27	4	4	4	4	3	19

Appendix 2

The Experimental Research Procedure

No.	Date and Day	Control Group	Day and Date	Experimental Group
1.	Wednesday, March 14th, 2018 at 07.50-09.30 am	Pretest (Individually)	Wednesday, March 14th, 2018 at 09.30 – 11.10 am	Pretest (Individually)
2.	Wednesday, March 21st, 2018 at 07.50-09.30	Teacher's material about describing a process	Wednesday, March 21st, 2018 at 07.50-09.30	Teacher's material about describing a process, a group selection a project discussion (recorded outside the class hour)
3.	Wednesday, March 28th, 2018	Writing and Reading Activity (reading activity of describing a process submitted by the students)	Wednesday, March 28th, 2018	**1st Project:** A Presentation of Product Concepts
4.	Wednesday, April 18th, 2018	Doing tasks from handouts and reading	Wednesday, April 18th, 2018	**2nd project (part 1):** A presentation of products (accompanied by a video tutorial of the product making)

5.	Wednesday, April 25th, 2018	Writing tasks and reading	Wednesday, April 25th, 2018	**2nd project (part 2):** A presentation of products (accompanied by a video tutorial of the product making)
6.	Wednesday, May 2nd. 2018	Writing tasks and reading	Wednesday, May 2nd. 2018	**3rd project:** A presentation of Campaign-Posters (a short discussion)
7.	Wednesday, May 9th, 2018	Post Test	Wednesday, May 9th, 2018	**4rd Project:** Campaign-video Upload on Facebook (done outside class hour) And Post test
8.	Wednesday, May 16th, 2018	Having a new topic	Wednesday, May 16th, 2018	Having a new topic Questionnaires and Interviews (conducted) after class)

Appendix 3

Validity Tests of the Questionnaires

A. Validity Test of Speaking Skills

Correlations

		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Total_Q
Q1	Pearson Correlation	1	.630**	.162	.474*	.339	.411*	.379	.000	.000	.175	.379	.147	.543**
	Sig. (2-tailed)		.000	.420	.012	.084	.033	.051	1.000	1.000	.381	.051	.463	.003
	N	27	27	27	27	27	27	27	27	27	27	27	27	27
Q2	Pearson Correlation	.630**	1	.235	.577**	.679**	.227	.487**	.091	-.086	.538**	.351	.357	.681**
	Sig. (2-tailed)	.000		.238	.002	.000	.255	.010	.652	.669	.004	.072	.068	.000
	N	27	27	27	27	27	27	27	27	27	27	27	27	27
Q3	Pearson Correlation	.162	.235	1	.320	.154	.028	.089	.277	.684**	.311	.254	.319	.633**
	Sig. (2-tailed)	.420	.238		.104	.444	.891	.659	.162	.000	.115	.200	.104	.000
	N	27	27	27	27	27	27	27	27	27	27	27	27	27
Q4	Pearson Correlation	.474*	.577**	.320	1	.686**	.289	.479*	.289	.000	.277	.335	.326	.686**
	Sig. (2-tailed)	.012	.002	.104		.000	.144	.011	.144	1.000	.161	.087	.097	.000
	N	27	27	27	27	27	27	27	27	27	27	27	27	27
Q5	Pearson Correlation	.339	.679**	.154	.686**	1	.260	.452*	.149	-.141	.309	.230	.320	.592**
	Sig. (2-tailed)	.084	.000	.444	.000		.190	.018	.460	.483	.117	.249	.104	.001
	N	27	27	27	27	27	27	27	27	27	27	27	27	27
Q6	Pearson Correlation	.411*	.227	.028	.289	.260	1	.290	.000	-.079	.240	.041	.283	.393*

	Sig. (2-tailed)	.033	.255	.891	.144	.190		.142	1.000	.695	.228	.837	.153	.043
	N	27	27	27	27	27	27	27	27	27	27	27	27	27
Q7	Pearson Correlation	.379	.487**	.089	.479*	.452*	.290	1	-.083	.000	.345	.257	.478*	.561**
	Sig. (2-tailed)	.051	.010	.659	.011	.018	.142		.681	1.000	.078	.196	.012	.002
	N	27	27	27	27	27	27	27	27	27	27	27	27	27
Q8	Pearson Correlation	.000	.091	.277	.289	.149	.000	-.083	1	.316	.360	.290	.162	.426*
	Sig. (2-tailed)	1.000	.652	.162	.144	.460	1.000	.681		.108	.065	.142	.421	.027
	N	27	27	27	27	27	27	27	27	27	27	27	27	27
Q9	Pearson Correlation	.000	-.086	.684**	.000	-.141	-.079	.000	.316	1	.076	.236	.306	.436*
	Sig. (2-tailed)	1.000	.669	.000	1.000	.483	.695	1.000	.108		.707	.236	.120	.023
	N	27	27	27	27	27	27	27	27	27	27	27	27	27
Q10	Pearson Correlation	.175	.538**	.311	.277	.309	.240	.345	.360	.076	1	.584**	.647**	.682**
	Sig. (2-tailed)	.381	.004	.115	.161	.117	.228	.078	.065	.707		.001	.000	.000
	N	27	27	27	27	27	27	27	27	27	27	27	27	27
Q11	Pearson Correlation	.379	.351	.254	.335	.230	.041	.257	.290	.236	.584**	1	.357	.612**
	Sig. (2-tailed)	.051	.072	.200	.087	.249	.837	.196	.142	.236	.001		.067	.001
	N	27	27	27	27	27	27	27	27	27	27	27	27	27
Q12	Pearson Correlation	.147	.357	.319	.326	.320	.283	.478*	.162	.306	.647**	.357	1	.681**
	Sig. (2-tailed)	.463	.068	.104	.097	.104	.153	.012	.421	.120	.000	.067		.000
	N	27	27	27	27	27	27	27	27	27	27	27	27	27

Total_Q	Pearson Correlation	.543**	.681**	.633**	.686**	.592**	.393*	.561**	.426*	.436*	.682**	.612**	.681**	1
	Sig. (2-tailed)	.003	.000	.000	.000	.001	.043	.002	.027	.023	.000	.001	.000	
	N	27	27	27	27	27	27	27	27	27	27	27	27	27

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

B. Validity Tests of Critical-Thinking and Problem-Solving Skills

Correlations

		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Total_Q
Q1	Pearson Correlation	1	.586**	.301	.414*	.456*	.182	-.010	.271	.360	.174	.432*	.575**
	Sig. (2-tailed)		.001	.128	.032	.017	.364	.960	.171	.065	.385	.024	.002
	N	27	27	27	27	27	27	27	27	27	27	27	27
Q2	Pearson Correlation	.586**	1	.346	.486*	.644**	.484*	.303	.210	.273	.138	.258	.660**
	Sig. (2-tailed)	.001		.077	.010	.000	.011	.124	.294	.169	.492	.193	.000
	N	27	27	27	27	27	27	27	27	27	27	27	27
Q3	Pearson Correlation	.301	.346	1	.647**	.398*	.559**	.338	.533**	.304	.452*	.346	.723**
	Sig. (2-tailed)	.128	.077		.000	.040	.002	.085	.004	.123	.018	.077	.000
	N	27	27	27	27	27	27	27	27	27	27	27	27
Q4	Pearson Correlation	.414*	.486*	.647**	1	.250	.495**	.348	.303	.313	.458*	.241	.697**
	Sig. (2-tailed)	.032	.010	.000		.209	.009	.076	.124	.112	.016	.226	.000
	N	27	27	27	27	27	27	27	27	27	27	27	27
Q5	Pearson Correlation	.456*	.644**	.398*	.250	1	.560**	.348	.094	.313	.444*	.243	.662**
	Sig. (2-tailed)	.017	.000	.040	.209		.002	.075	.639	.112	.020	.223	.000
	N	27	27	27	27	27	27	27	27	27	27	27	27
Q6	Pearson Correlation	.182	.484*	.559**	.495**	.560**	1	.621**	.262	.321	.511**	.335	.743**
	Sig. (2-tailed)	.364	.011	.002	.009	.002		.001	.187	.102	.006	.087	.000
	N	27	27	27	27	27	27	27	27	27	27	27	27
Q7	Pearson Correlation	-.010	.303	.338	.348	.348	.621**	1	.187	.266	.396*	.303	.579**
	Sig. (2-tailed)	.960	.124	.085	.076	.075	.001		.352	.180	.041	.124	.002
	N	27	27	27	27	27	27	27	27	27	27	27	27
Q8	Pearson Correlation	.271	.210	.533**	.303	.094	.262	.187	1	.420*	.229	.681**	.572**
	Sig. (2-tailed)	.171	.294	.004	.124	.639	.187	.352		.029	.250	.000	.002
	N	27	27	27	27	27	27	27	27	27	27	27	27
Q9	Pearson Correlation	.360	.273	.304	.313	.313	.321	.266	.420*	1	.486*	.629**	.664**
	Sig. (2-tailed)	.065	.169	.123	.112	.112	.102	.180	.029		.010	.000	.000
	N	27	27	27	27	27	27	27	27	27	27	27	27
Q10	Pearson Correlation	.174	.138	.452*	.458*	.444*	.511**	.396*	.229	.486*	1	.301	.638**
	Sig. (2-tailed)	.385	.492	.018	.016	.020	.006	.041	.250	.010		.128	.000
	N	27	27	27	27	27	27	27	27	27	27	27	27
Q11	Pearson Correlation	.432*	.258	.346	.241	.243	.335	.303	.681**	.629**	.301	1	.660**
	Sig. (2-tailed)	.024	.193	.077	.226	.223	.087	.124	.000	.000	.128		.000
	N	27	27	27	27	27	27	27	27	27	27	27	27
Total_Q	Pearson Correlation	.575**	.660**	.723**	.697**	.662**	.743**	.579**	.572**	.664**	.638**	.660**	1
	Sig. (2-tailed)	.002	.000	.000	.000	.000	.000	.002	.002	.000	.000	.000	
	N	27	27	27	27	27	27	27	27	27	27	27	27

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

C. Validity Tests of Communication Skills

Correlations

		Q1	Q2	Q3	Q4	Q5	TOTAL_Q
Q1	Pearson Correlation	1	.250	.048	.139	.090	.437*
	Sig. (2-tailed)		.209	.812	.490	.656	.023
	N	27	27	27	27	27	27
Q2	Pearson Correlation	.250	1	.311	.277	.449*	.631**
	Sig. (2-tailed)	.209		.114	.161	.019	.000
	N	27	27	27	27	27	27
Q3	Pearson Correlation	.048	.311	1	.226	.314	.605**
	Sig. (2-tailed)	.812	.114		.257	.111	.001
	N	27	27	27	27	27	27
Q4	Pearson Correlation	.139	.277	.226	1	.610**	.741**
	Sig. (2-tailed)	.490	.161	.257		.001	.000
	N	27	27	27	27	27	27
Q5	Pearson Correlation	.090	.449*	.314	.610**	1	.794**
	Sig. (2-tailed)	.656	.019	.111	.001		.000
	N	27	27	27	27	27	27
TOTAL_Q	Pearson Correlation	.437*	.631**	.605**	.741**	.794**	1
	Sig. (2-tailed)	.023	.000	.001	.000	.000	
	N	27	27	27	27	27	27

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

D. Validity Tests of Collaboration Skills

Correlations

		Q1	Q2	Q3	Total_Q
Q1	Pearson Correlation	1	.559**	-.034	.670**
	Sig. (2-tailed)		.002	.867	.000
	N	27	27	27	27
Q2	Pearson Correlation	.559**	1	.358	.864**
	Sig. (2-tailed)	.002		.067	.000
	N	27	27	27	27
Q3	Pearson Correlation	-.034	.358	1	.646**
	Sig. (2-tailed)	.867	.067		.000
	N	27	27	27	27
Total_Q	Pearson Correlation	.670**	.864**	.646**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	27	27	27	27

**. Correlation is significant at the 0.01 level (2-tailed).

E. Validity Tests of Creativity and Innovation Skills

Correlations

		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Total_Q
Q1	Pearson Correlation	1	.084	.283	.140	.153	.297	.312	.494**
	Sig. (2-tailed)		.676	.152	.487	.447	.133	.114	.009
	N	27	27	27	27	27	27	27	27
Q2	Pearson Correlation	.084	1	.486*	.312	.472*	.630**	.389*	.742**
	Sig. (2-tailed)	.676		.010	.113	.013	.000	.045	.000
	N	27	27	27	27	27	27	27	27
Q3	Pearson Correlation	.283	.486*	1	.085	.571**	.207	.208	.672**
	Sig. (2-tailed)	.152	.010		.672	.002	.301	.297	.000
	N	27	27	27	27	27	27	27	27
Q4	Pearson Correlation	.140	.312	.085	1	.199	.341	.076	.447*
	Sig. (2-tailed)	.487	.113	.672		.321	.081	.706	.019
	N	27	27	27	27	27	27	27	27
Q5	Pearson Correlation	.153	.472*	.571**	.199	1	.591**	.307	.754**
	Sig. (2-tailed)	.447	.013	.002	.321		.001	.120	.000
	N	27	27	27	27	27	27	27	27
Q6	Pearson Correlation	.297	.630**	.207	.341	.591**	1	.517**	.773**
	Sig. (2-tailed)	.133	.000	.301	.081	.001		.006	.000
	N	27	27	27	27	27	27	27	27
Q7	Pearson Correlation	.312	.389*	.208	.076	.307	.517**	1	.615**
	Sig. (2-tailed)	.114	.045	.297	.706	.120	.006		.001
	N	27	27	27	27	27	27	27	27
Total_Q	Pearson Correlation	.494**	.742**	.672**	.447*	.754**	.773**	.615**	1

	Sig. (2-tailed)	.009	.000	.000	.019	.000	.000	.001	
	N	27	27	27	27	27	27	27	27

Reliability Test for Questionnaires

A. Speaking

Reliability Statistics

Cronbach's Alpha	N of Items
.802	12

B. Critical thinking and problem solving

Reliability Statistics

Cronbach's Alpha	N of Items
.863	11

C. Communication

Reliability Statistics

Cronbach's Alpha	N of Items
.638	5

D. Collaboration

Reliability Statistics

Cronbach's Alpha	N of Items
.628	3

E. Creativity and Innovation

Reliability Statistics

Cronbach's Alpha	N of Items
.763	7

Appendix 4

The Research Questionnaires

ANGKET PENELITIAN

Identitas Mahasiswa

NIM :

Tujuan Kuesioner :

- Kuesioner ini bertujuan untuk mengambil data dalam rangka penulisan tesis oleh mahasiswa Magister Ilmu Linguistik 2016/2017 Universitas Diponegoro yang berjudul:

  Enhancing Speaking Skills and the Four Cs through Project-Based Learning for the Electrical Engineering Students of Sultan Agung Islamic University in the Academic Year of 2017/ 2018

- Penulis akan merefleksi keadaan yang sesungguhnya untuk mengidentifikasi kekuatan dan kelemahan metode yang digunakan dalam pembelajaran Bahasa Inggris, sehingga dapat memberikan input, referensi, dan perbaikan menyangkut penggunaan metode pembelajaran yang tepat serta mencetak lulusan yang berdaya saing international sesuai kebutuhan akan keahlian abad 21 yang ditunjang oleh 4C (C*ritical thinking and problem solving, Communication, Collaboration, and Creativity and innovation*).
- Dalam angket ini terdapat pertanyaan-pertanyaan yang bersifat tertutup. Oleh karena itu, Teman-teman diharapkan untuk mengisi jawaban tersebut dengan memberi tanda centang (√) sesuai dengan apa yang Teman-teman alami dan rasakan. Alternatif jawaban disediakan dengan kriteria:
  - Sangat Setuju (SS)
  - Setuju (S)
  - Netral (N)
  - Tidak Setuju (TS)
  - Sangat Tidak Setuju (STS)

- ❖ Isilah angket ini dengan jujur dan penuh ketelitian serta tidak terpengaruh dengan jawaban teman.
- ❖ Jawaban yang diberikan dalam angket ini tidak akan mempengaruhi nilai mata kuliah Bahasa Inggris.
- ❖ Tidak lupa saya ucapkan terima kasih atas kejujuran dan bantuan yang diberikan.

Kemampuan Bahasa Inggris

No.	Pernyataan	SS	S	N	TS	STS
1.	Pembelajaran Berbasis Proyek memberi kesempatan saya berbicara aktif dalam bahasa Inggris.					
2.	Proyek-proyek yang diberikan membantu saya tampil di depan teman-teman dengan pelafalann Bahasa Inggris yang benar.					
3.	Proyek- proyek yang diberikan memperkaya kosa kata bahasa Inggris saya.					
4.	Proyek-proyek yang diberikan mendorong saya untuk berbicara dengan tata bahasa yang benar.					
5.	Proyek-proyek yang diberikan meningkatkan kemampuan menyampaikan dan memahami informasi dalam bahasa Inggris.					
6.	Proyek- proyek melatih saya berbicara bahasa Inggris dengan lancar.					
7.	Pembelajaran Berbasis Proyek meningkatkan kemampuan dalam menukar informasi dan					

	pendapat dalam bahasa Inggris, khususnya dalam sesi dalam diskusi dan tanya jawab.					
8.	Saya mengerjakan tugas-tugas pembelajaran berbasis proyek dengan senang hati.					
9.	Saya merasa lebih percaya diri berbicara bahasa Inggris.					
10.	Pembelajaran Berbasis Proyek membuat saya selalu terlibat dalam setiap pembejaran.					
11.	Pembelajaran Berbasis Proyek mmebuat saya lebih termotivasi untuk belajar Bahasa Inggris.					
12.	Pembelajaran Berbasis Proyek adalah metode pembelajaran yang sesuai dalam mempersiapkan mahasiswa di masa depan.					

Kemampuan Berpikir Kritis dan Memecahkan Masalah

No.	**Pernyataan**	**SS**	**S**	**N**	**TS**	**STS**
1.	Pembelajaran Berbasis Proyek mendorong kemampuan berpikir saya.					
2.	Pembelajaran Berbasis Proyek melatih saya merancang proyek hingga selesai.					
3.	Saya mampu mengevaluasi informasi, materi, dan komponen yang dibutuhkan proyek saya.					
4.	Saya dapat menganalisa informasi, materi dan pendapat orang lain tanpa menghakimi.					
5.	Saya lebih mampu memahami materi pelajaran					

	yang diajarkan dengan menjelajah informasi dari berbagai media.					
6.	Saya mampu menilai kelebihan dan kekurangan produk yang saya buat.					
7.	Saya mengumpulkan informasi penting terkait produk yang saya kerjakan.					
8.	Saya mampu menarik kesimpulan dari informasi yang saya dapatkan untuk keberlanjutan proyek saya.					
9.	Pembelajaran Berbasis Proyek memberikan pengalaman dan proses belajar.					
10.	Pembelajaran-Berbasis Proyek melatih saya mengatasi masalah yang timbul dalam pengerjaan produk saya.					
11.	Saya dapat menjawab pertanyaan teman atau kelompok lain dengan argument yang tepat.					

Kemampuan Berkomunikasi

No.	**Pernyataan**	**SS**	**S**	**N**	**TS**	**STS**
1.	Saya dapat menyampaikan ide dan pendapat saya melalui menggunakan komunikasi verbal (lisan, tulisan) maupun komunikasi non-verbal.					
2.	Saya lebih mampu mendengarkan dan					

	menghargai pendapat orang/ kelompok lain.					
3.	Saya dapat menggunakan bahasa Inggris untuk bermacam fungsi (contoh: memberi informasi, memberi perintah, memotivasi, membujuk, dan lain-lain).					
4.	Saya dapat menggunakan berbagai media dan teknologi untuk mendukung proyek saya.					
5.	Saya dapat berkomunikasi dengan teman dari berbagai latar belakang pendidikan, budaya, dan lingkungan.					

Kemampuan Bekerjasama/ Kolaborasi

No.	Pernyataan	SS	S	N	TS	STS
1.	Saya mampu bekerja sama dengan teman-teman kelompok.					
2.	Saya menjadi terlatih berkompromi dengan anggota kelompok untuk menyelesaikan proyek saya.					
3.	*Project-Based Learning* dapat melatih berbagi tugas, berbagi tanggungjawab, dan menghargai konstribusi masing-masing anggota.					

Kemampuan Berkreativitas dan Berinovasi

No.	Pernyataan	SS	S	N	TS	STS
1.	Saya menjadi lebih tertarik untuk menyumbang ide dalam pengerjaan proyek saya.					

2	Saya dapat mengembangkan ide-ide baru untuk proyek-proyek saya.					
3.	Saya dapat menilai ide-ide saya sendiri untuk meningkatkan kualitas produk saya.					
4.	Saya dapat mengembangkan dan menerapkan ide-ide baru kepada yang lain secara efektif.					
5.	Saya dapat menjadi lebih tanggap memberikan saran dan ide-ide baru ke dalam proyek.					
6.	Saya termotivasi menunjukkan keaslian dan kemampuan inventif saya dalam perngerjaan proyek saya.					
7.	Saya belajar tentang arti kegagalan dan proses sebagai peluang belajar.					

Atas keikhlasan dan kejujuran teman-teman dalam menjawab pertanyaan dalam angket ini, saya selaku peneliti, mengucapkan terima kasih yang sebesar-besarnya.

Hormat saya,

Peneliti

Sintya Mutiara W.E.

Appendix 5:

The Mean Scores of the Questionnaire

a. Speaking Skills

Resp.	1	2	3	4	5	6	7	8	9	10	11	12
R1	5	5	5	4	4	5	5	4	4	5	4	5
R2	5	5	5	5	5	5	5	5	4	5	5	5
R3	4	4	4	4	4	4	4	4	4	5	5	5
R4	4	4	4	4	4	4	4	4	4	4	4	4
R5	4	4	4	4	4	4	5	5	5	4	4	5
R6	4	4	4	4	4	4	4	4	4	4	4	4
R7	4	4	5	5	4	5	4	5	5	4	4	5
R8	5	5	5	5	5	5	5	4	4	4	4	4
R9	4	4	4	4	3	4	3	5	3	4	4	3
R10	5	5	4	4	4	4	4	4	5	4	5	4
R11	5	5	5	5	5	5	5	5	5	5	5	5
R12	5	5	5	5	5	5	4	5	4	5	5	5
R13	4	5	5	5	5	4	4	5	5	5	4	5
R14	5	5	5	5	4	4	5	3	4	4	4	5
R15	4	4	4	4	3	4	4	4	4	4	4	4
R16	5	5	4	4	4	5	4	4	4	5	5	5
R17	5	4	4	4	4	5	3	4	4	3	3	4
R18	4	4	4	4	4	4	4	4	4	4	4	4
R19	5	5	5	5	5	3	4	5	4	4	5	4
R20	4	4	4	4	4	4	4	4	5	3	4	4
R21	4	4	4	4	4	4	4	4	3	4	4	4
R22	4	5	4	4	4	4	4	5	4	5	4	5
R23	4	5	4	4	5	4	4	4	3	4	3	4
R24	4	4	4	4	4	5	4	4	4	4	4	4
R25	5	4	4	4	3	4	4	5	5	4	4	4
R26	4	4	3	4	4	4	4	4	3	4	4	5
R27	5	5	1	5	5	5	5	4	1	4	4	4
TOTAL	**120**	**121**	**113**	**117**	**113**	**117**	**113**	**117**	**108**	**114**	**113**	**119**
MEAN SCORE	**4.44**	**4.481**	**4.185**	**4.333**	**4.185**	**4.333**	**4.185**	**4.333**	**4**	**4.2222**	**4.1852**	**4.4074**
speaking skills												

b. Critical Thinking and Problem Solving

Resp.	1	2	3	4	5	6	7	8	9	10	11
R1	4	4	5	5	4	5	5	4	5	5	5
R2	5	5	5	5	5	5	5	5	5	5	5
R3	4	4	4	4	4	4	4	4	5	5	4
R4	4	4	4	4	4	4	3	4	4	4	4
R5	4	4	5	4	4	4	4	4	4	4	4
R6	4	5	4	4	4	5	4	4	4	4	4
R7	5	4	5	4	4	4	4	5	5	4	5
R8	4	5	5	4	5	5	5	4	4	4	4
R9	4	4	4	3	4	4	4	5	5	4	5
R10	5	5	4	4	4	4	4	4	4	4	5
R11	5	5	5	5	5	5	5	5	5	5	5
R12	5	5	4	4	5	4	4	4	5	4	5
R13	4	5	5	5	4	5	5	5	5	4	5
R14	5	5	5	4	5	5	4	5	4	4	5
R15	4	4	4	4	4	5	5	4	4	4	4
R16	4	4	4	3	4	4	4	4	3	4	4
R17	4	5	4	4	5	4	5	4	4	4	4
R18	4	4	4	4	3	4	5	5	4	4	5
R19	4	4	4	4	4	4	4	4	3	4	4
R20	4	5	5	4	5	5	5	5	5	5	5
R21	4	4	4	3	4	4	4	4	4	4	4
R22	5	5	5	5	5	5	5	4	4	5	4
R23	5	5	4	4	5	5	5	4	5	4	5
R24	4	4	4	4	4	4	4	4	4	4	4
R25	5	5	4	4	4	4	4	4	5	4	4
R26	5	5	5	5	5	5	4	5	5	5	5
R27	4	4	4	3	5	5	5	4	5	5	5
TOTAL	**118**	**122**	**119**	**110**	**118**	**121**	**119**	**117**	**119**	**116**	**122**
MEAN SCORE	**4.4**	**4.52**	**4.4**	**4.1**	**4.4**	**4.5**	**4.4**	**4.3**	**4.4**	**4.3**	**4.5**
	critical thinking and problem solving										

Resp.	1	2	3	4	5	1	2	3
R1	4	5	5	4	5	5	5	5
R2	5	5	5	5	5	5	5	4
R3	4	4	4	4	4	5	5	4
R4	4	4	4	4	4	5	5	5
R5	4	4	4	4	4	4	4	4
R6	4	4	4	4	4	4	4	4
R7	5	4	5	4	4	4	4	5
R8	4	4	5	4	4	5	5	5
R9	4	4	4	3	4	5	4	4
R10	4	4	4	4	4	4	4	4
R11	4	4	4	5	5	5	5	5
R12	5	5	4	5	5	5	5	5
R13	5	4	3	4	5	5	5	5
R14	4	4	5	5	5	4	4	5
R15	4	4	4	4	4	4	5	5
R16	5	4	4	4	4	4	5	5
R17	4	4	4	5	4	5	5	4
R18	4	4	4	4	4	4	4	5
R19	5	4	4	3	3	4	5	4
R20	4	4	4	5	4	5	5	5
R21	4	4	4	4	4	4	4	4
R22	4	4	3	4	4	5	5	5
R23	5	4	5	5	5	5	5	4
R24	4	4	4	4	4	4	4	4
R25	5	4	4	4	3	4	5	5
R26	4	4	5	4	5	4	4	5
R27	5	4	4	5	5	5	4	3
TOTAL	**117**	**111**	**113**	**114**	**115**	**122**	**124**	**122**
MEAN SCORE	**4.3**	**4.1**	**4.2**	**4**	**4.3**	**4.5**	**4.6**	**4.5**
	communication					**collaboration**		

Resp.	1	2	3	4	5	6	7
R1	4	5	5	4	5	4	4
R2	5	5	5	5	5	5	5
R3	4	4	4	5	4	4	4
R4	4	4	4	4	4	4	4
R5	4	4	4	4	4	3	4
R6	4	4	4	4	4	4	4
R7	5	4	5	4	5	4	5
R8	4	5	4	5	5	5	4
R9	4	4	3	4	4	4	4
R10	4	5	5	4	4	4	4
R11	4	4	3	4	4	4	4
R12	3	5	4	4	5	5	5
R13	5	4	4	4	3	4	4
R14	4	5	5	4	4	4	5
R15	4	4	4	4	4	4	4
R16	4	4	3	4	3	4	4
R17	4	4	4	4	4	4	5
R18	5	5	5	5	5	5	5
R19	5	4	4	4	4	4	4
R20	5	5	4	5	5	5	5
R21	4	4	4	4	4	4	4
R22	4	5	4	4	4	4	4
R23	4	5	5	5	4	4	4
R24	4	4	4	4	4	4	5
R25	4	4	5	4	5	4	4
R26	4	4	5	4	5	4	3
R27	5	5	5	3	5	5	5
TOTAL	**114**	**119**	**115**	**113**	**116**	**113**	**116**
MEAN SCORE	**4.2**	**4.4**	**4.3**	**4.2**	**4.3**	**4.2**	**4.3**
creativity and innovation							

Appendix 6:

The Interview Guideline

1. Bagaimana menurutmu tentang belajar Bahasa Inggris dengan kegiatan membuat produk-produk kemarin? Apakah itu bisa membuatmu berbicara lebih banyak?
2. Apakah kegiatan belajar dengan proyek kemarin membuatmu lebih berani berbisacara Bahasa Inggris?
3. Apakah dengan kegiatan belajar dengan menggunakan proyek kemaren dapat meningkatkan kemampuan berbahasa Inggris? Contoh: Kamu jadi lebih bisa mengucapkan kata-kata Bahasa inggris dengan benar? Jelaskan ya!
4. Apakah dengan kegiatan belajar dengan menggunakan proyek kemarin dapat menambah kosa kata Bahasa Inggris? Mengapa?
5. Apakah dengan kegiatan belajar dengan menggunakan proyek kemarin dapat membantumu menyusun kata-kata Bahasa Inggris menjadi kalimat yang benar? Mengapa?
6. Apakah dengan kegiatan belajar dengan menggunakan proyek itu mmembuatmu mampu memahami apa yang kamu sampaikan ke teman? Dan kamu paham yang temanmu sampaikan dalam Bahasa Inggris? Coba jelaskan!
7. Apakah kegiatan belajar dengan proyek itu membuatmu lancar berbicara dengan Bahasa Inggris? Mengapa?
8. Apakah kegiatan belajar dengan proyek kemarin dapat membuat kamu bisa saling tukar informasi dan pendapat dengan teman-teman dan dosenmu dalam Bahasa Inggris? Gimana contohnya?
9. Apakah kamu menikmati kegiatan belajar dengan menggunakan proyek dengan menggunakan Bahasa Inggris itu menarik buatmu? Kamu puas

dengan pencapaianmu dalam berbicara Bahasa Inggris? Apa yang menarik? Jelaskan?

10. Apakah kegiatan belajar dengan menggunakan proyek memotivasimu jadi ingin belajar berbicara Bahasa inggris? Mengapa?
11. Apakah kegiatan belajar dengan proyek membuatmu lebih percaya diri dalam bericara menggunakan Bahasa inggris? Mengapa?
12. Apakah kegiatan belajar berbicara Bahasa inggris dengan proyek kemarin juga meningkatkan kemampuamu berpikir kritis? Mengapa?
13. Apakah kegiatan berbicara Bahasa inggris dengan proyek juga meningkatkan kemampuanmu memecahkan masalah? Jelaskan?
14. Apakah kegiatan berbicara bahasa Inggris dengan proyek kemarin juga meningkatkan kemampuamu berkomunikasi dengan teman sekelompok maupun antar kelompok? Dalam hal apa itu?
15. Apakah kegiatan berbicara bahasa Inggris dengan proyek kemarin juga meningkatkan kemampuamu dalam bekerjasama? Mengapa?
16. Apakah kegiatan berbicara bahasa Inggris dengan proyek kemarin meningkatkan kemampuamu dalam bekreasi dan berinovasi? Apa contohnya?
17. Apakah berbicara bahasa Inggris itu penting di abad 21 ini? Mengapa?
18. Apakah kemampuan berpikir kritis dan memecahkan masalah, berkomunikasi, bekerjasama, dan berkreasi dan berinovasi itu diperlukan di jaman sekarang ini? Mengapa?
19. Apakah kamu mempunyai kendala atau masalah dalam kegiatan berbasis proyek kemarin? Apa itu?

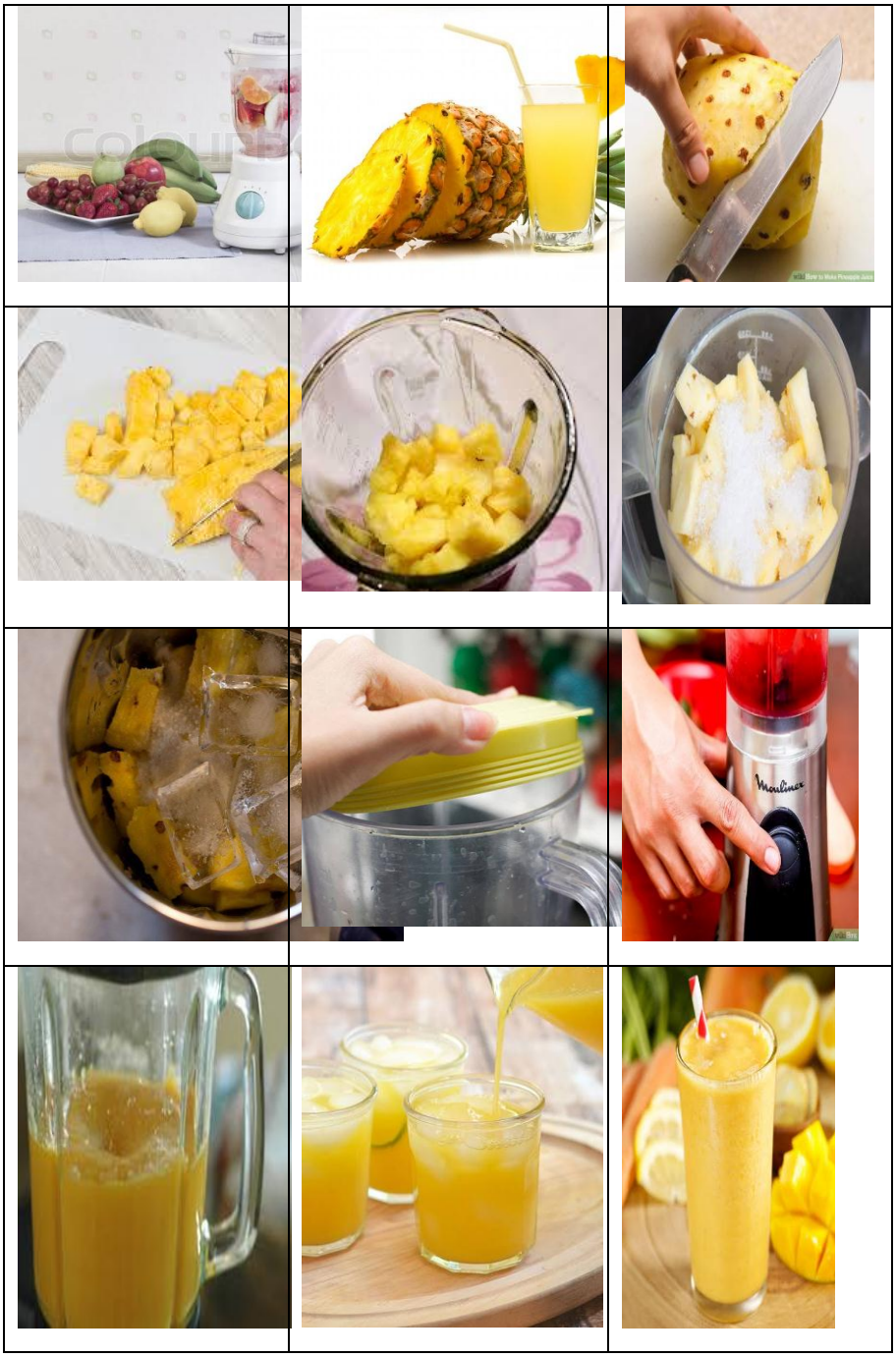
Appendix 7

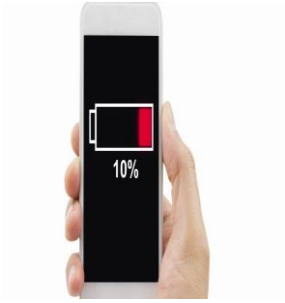
The Speaking Rubrics

Category	Grammar	Vocabulary	Pronunciation	Fluency	Comprehension
5	Grammatical and lexical accuracy are extremely high	Vocabulary is fully acceptable in all levels	Very clear, stress and intonation help to make meaning clear	Speak fluently without hesitation or searching for words	Can comprehend the whole conversation clearly.
4	Able to use the language accurately. Errors are rare.	Can understand and take part in any conversation. Master high degree vocabulary	Errors in pronunciation are rarely found	Able to use the language on all levels without any problems. Can participate in any conversation with a high degree of fluency	Can understand any conversation within the range experience
3	Able to speak with sufficient structural accuracy in conversation	Able to speak with sufficient vocabulary and rarely confused with words	Errors sometimes appear but still intelligible. Strange accent may appear	Able to discuss certain topics without groping for words	Can understand on a normal speaking speed
2	Able to handle simple construction but not	Only able to speak with simple vocabulary	Errors in pronunction are often but intelligible	Able to handle simple casual conversatio	Can get the points of the topics, but limited.

	confident enough to build the phrases/ phrases			n, such as introduction , family, and work	
1	No mastery in sentence constructio n	Almost unable to mention relevant vocabulary	Always repeat wrong pronunction	Almost unable to Communica te. Always repeat the words or phrases.	Can understand only simple statements or questions limitedly, need repetition and slow speech

Appendix 8

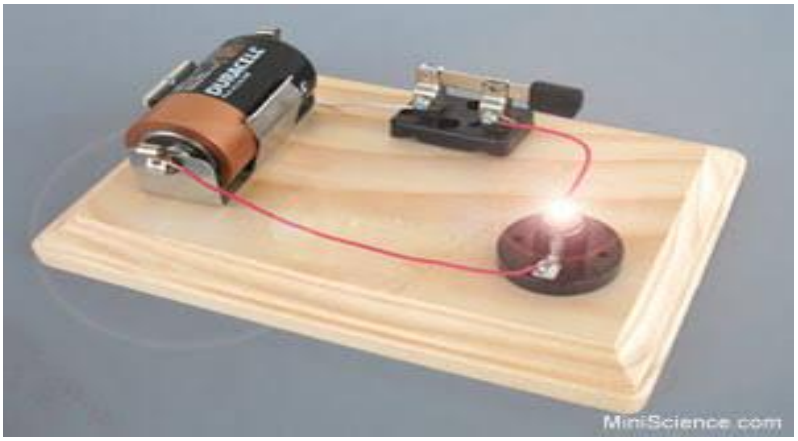



10%


ROKER
TRAVEL CHARGER


SAMSUNG


SAMSUNG
77%
Fast Charging



Picture 1:	**Picture 2**	**Picture 3:**
Questions: a. What is your name? b. Tell me about you? c. What is this? (pointing to a blender) d. What is it like? e. What is it for? f. Tell me how to make it!	Questions: 1. What is this? (pointing to a charger) 2. What is it like? 3. What is if for? 4. Tell me how to do it!	Questions: a. What are these? (pointing to the battery, switch, bulb lamp, wire) b. What is it for? c. Tell me how to do it!

Appendix 9:

Documentation

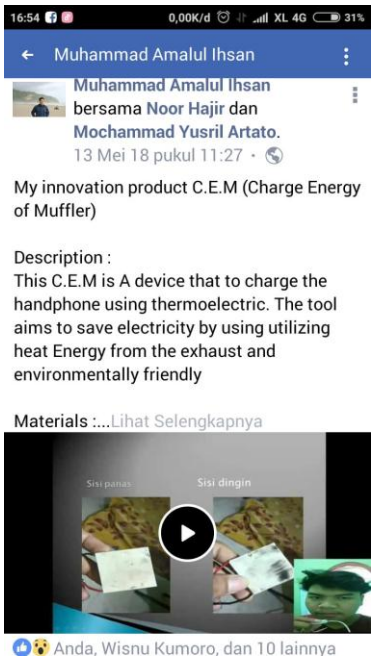
The Clap Switch Team

The Muffler Handphone Charger Team

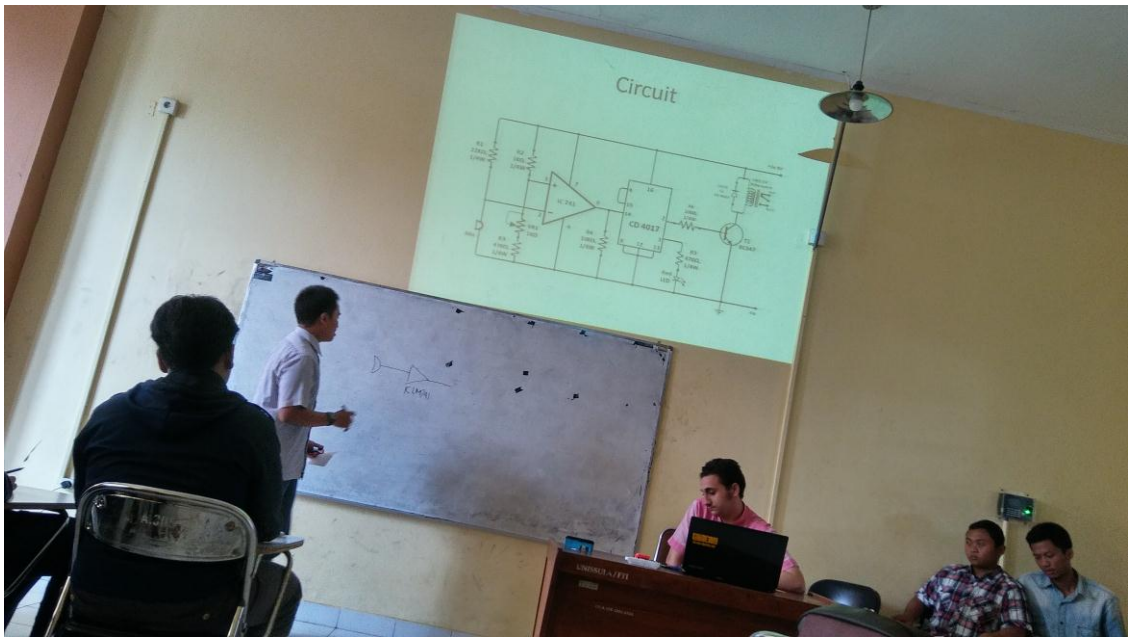
The Safe Mosquito Repellent Team

The Soil Fertility Checker Team

A Poster Making Sample



Campain-video upload (promotion)



A Product-Concept Presentation

A Discussion Video

The Speaking Test

The Electrical Engineering Students of UNISSULA (2017/ 2018)