Collaborative ESP Online Material Design Project and English Education Students' 21st Century Skills

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Abstract. The Ministry of Education and Culture of Republic of Indonesia recently modified "Profil Pelajar Pancasila" measurements in Merdeka Curriculum in an effort to provide 21st century capabilities in education. Today's curriculum is simultaneously improved in all areas, particularly thanks to the Project Based Learning approach, which is firmly ingrained in each topic. This study sought to understand how students felt about their project-based learning assignment using personally selected ESP online material design. Through a questionnaire on PBL/PjBL, the perceptions were elicited. The students used the ADDIE methodology of online instructional design for this project, and Google Classroom was the media of choice for the ESP online instruction simulation of peer online teaching. When given a task to create ESP online content through Google Classroom, English education students expressed a favorable opinion of how it will improve their 21st century skills. According to the results of the hypotheses test, it was determined that the project had significantly positive effects on students' collaboration and critical thinking abilities; however, it also showed a positive relationship with students' IT skills, albeit not very significantly, as it allowed them to become competent users of asynchronous teaching apps like the GCR rather than skilled IT technicians.

Keywords: 21st century skills · Profil Pelajar Pancasila · Project-Based Learning · ESP

1 Introduction

The framework for education in the twenty-first century was created by P21 (Partnership for 21st Century Learning), which stated that learners would have knowledge, skills, and capacities in information and media technology, learning and innovation skills, as well as career and life skills [1]. Accordingly, Indonesia's Ministry of Education and Culture developed the 21st-century learning paradigm, focusing on students' capacities to gather

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information from many sources, create problems, engage in analytical thinking, and cooperate and collaborate in the solution of problems. Before that, BSNP had regulated that the 21st century learning framework included the following skills: a) critical thinking and problem-solving skills; b) communication and collaboration skills; c) creativity and innovation skills; d) information and communications technology literacy); e) contextual learning skills; and (f) information and media literacy [2].

As the minister of education's position changed, the policy likewise did so in response to the demands and changes in the field of education. The Merdeka Curriculum, the currently used curriculum, has improved the conception of these 21st century abilities with a nod to Indonesia's real-world circumstances, culture, and philosophy. As a result, the distinctive dimensions—commonly referred to as "The six dimensions of Profil Pelajar Pancasila"—such as piety to the GOD—for Indonesia is a country of many religions—and respect for differences among one another—for Indonesia is a country of various tribes and cultures as well as a member of the global society—are particularly added in the framework. Bertakwa kepada Tuhan Tang Maha Esa (Piety to GOD); Berfikir kritis (Critical Thinking); Kreatif; Mandiri; Bergotong-royong; and Berkebhinekaan Global (Gobal unity in diversity) [3, 4].

Since today's students are members of the digital generation (those born in the 2000s), project-based learning (PBL/PjBL) is thought to be one of the most effective teaching strategies for helping them develop the 21st century skills. Today, all topics at the secondary school or university levels, not to mention the English for Specific Purposes course in the English Education study program at Universitas Teknokrat Indonesia Lampung, require Project Based Learning in the instruction practice and evaluation. The subject was being studied by 30 pupils. In addition to studying the idea of ESP, they were given an assignment to create instructional materials for a particular branch of ESP for an online class peer teaching simulation due to the disruptive/pandemic COVID 19 situation. Additionally, they received computer and IT training as candidates for future instructors who must be prepared to take on the job of instructing younger future students who are also members of the digital generation.

The purpose of this study was to learn how students felt about Project-Based Learning after designing the ESP materials for their chosen branch to be posted and taught in a virtual classroom using Google Classroom as a platform for ESP peer teaching simulation. It also sought to determine how this PjBL related to their 21st-century skills, particularly their abilities in communication, collaboration, and computer and IT skills.

2 Literature Review

A. Project Based Learning

A learning model called PBL/PjBL structures learning around projects [5]. Projects are difficult assignments based on difficult questions or problems that require students to design, solve problems, make decisions, or conduct investigations. They also give students the chance to work independently for extended periods of time and result in realistic products or presentations [5]. Authentic evaluation, teacher facilitation but not direction, cooperative learning, reflection, and the inclusion of adult skills are other characteristics of PjBL [6].

The project-based learning approach in the field of English teaching and learning encourages students to grow in their language proficiency and accuracy while also developing their soft skills, or character traits, such self-assurance, problemsolving, teamwork, and decision-making [7]. Additionally, Markham explains how PjBL blends knowing and acting. Learning by doing is the cornerstone of this system because it allows students to apply what they have learned to solve realworld problems and achieve results that matter [8].

According to Railsback, there are several advantages of project-based learning, including: a) preparing students for the workplace; b) boosting motivation; c) connecting classroom learning with reality; d) providing collaborative opportunities to construct knowledge; e) increasing social and communication skills; f) increasing problem-solving skills; g) allowing students to make and see connections between disciplines; h) giving students opportunities to give back to their school or community;i) boosting self-esteem, j) promoting autonomy, k) enabling students to employ their unique learning styles, learning styles, and different learning techniques, and giving a useful, real-world method of learning how to use technology [9].

B. ESP material design project procedure

The use of PjBL in the ESP Course for English Education students involves a complicated and methodical structure in the students' learning activity, but it is flexible enough for the students to design and build a project depending on their needs and desires. The project structure makes it easier for the lecturer and the student to plan the creation of a particular branch of ESP content that will be tailored to the student's area of study interest. Students will end up generating an ESP material rather than only learning a certain ESP branch [9] by adapting Simpson's four steps in order to integrate project-based learning in ESP classrooms. 1) establishing the project's beginning, where the lecturer develops guiding questions so that students have an idea of what to do (designing one ESP online material for specific level students) and are encouraged to study or develop, and where students choose and establish the project outline and plan the method of development, the final outcomes, and individual participation in the project (how to use asynchronous learning media for the chosen ESP material); 2) creating the project, which entails information gathering to address the motivated issue by each group member, whether alone, in pairs, or as a group; 3) reporting to the class, which entails an activity centered on sharing and getting input from other students on the project's development (presenting the ESP material design on Google Classroom as medium for online peer teaching simulation in that each student became a teacher and the other students enrolled as students). Students' understanding of the issue and application of the skills and concepts required to finish the project are evaluated at several stages during the project; 4) evaluating the project by allowing each student, the class as a whole, the teacher, or a third party to assess the activity or product [11]. The opportunity to apply and share what they have learned and understood via their project is provided to the students during this stage, along with real-world experience.

In order for English Education students to benefit from project-based learning, its advantages were paired with ESP learning objectives in this study. They might use Google apps for asynchronous class to learn about the ESP course material and experience designing the simulated ESP materials together. It was one of the more accessible forms

of media for preparing to play the part of an English teacher in a disruptive setting where long-distance online learning was required for schooling as well as for instructing future students who are digital natives. In other words, they practiced design of ESP material if they were to teach ESP in school, practiced online teaching asynchronously with google classroom, experienced collaboration in the process of designing the ESP material, and practiced communicating their thoughts when they collaborated in the process. They also activated their critical thinking and problem solving when they learned the content of ESP branches. Overall, they improved their ability to function in the twenty-first century [1, 5–8, 11, 12].

C. ADDIE model of online instruction

The abbreviation ADDIE stands for analysis, design, development, implementation, and evaluation, and it reflects the five main stages of this well-liked online training system. The total number of steps for the full framework (in this case, the framework for designing online ESP content) is 19, consisting of the following: 1) Analysis, which entails examining a job, choosing task functions, creating work performance metrics, examining current curricula, and choosing an educational environment; 2) Design, where employing a storyboard is very beneficial to visualize the design and includes setting objectives, developing tests, describing entrance behavior, determining order and structure; 3) Development, which entails defining learning events/activities, defining an instructional management system and delivery method, examining and choosing from a pool of pre-existing resources, creating instruction, and validating instruction; 4) Implementation, which entails carrying out instruction and implementing the instructional management strategy; 5) Evaluation, which include conducting internal and external evaluations as well as system revision [10, 13].

D. Asynchronous classroom

Asynchronous learning networks are environments for teaching and learning that are part of computer-mediated communication systems and are created for usage anytime, anywhere via computer networks. A set of software-built group communication and work "spaces" and facilities make up an ALN. In place of actual venues, they serve as virtual spaces for class members to engage. A virtual classroom is a community in which students share emotional support, knowledge, and a sense of belonging as well as an instrumental group where students and instructors want to achieve goals [14, 15].

Due to the absence of their school's LMS (Learning Management System) or SPADA (Sistem Pembelajaran Dalam Jaringan)., English Education students and teachers all over the world who need to use asynchronous teaching for free can benefit from the simplicity of the Google Classroom Apps.

Google Classroom, a free blended learning software designed for educational institutions that intends to make creating, distributing, and grading assignments easier, was made available to the public on August 12, 2014 and is constantly being updated. Google Classroom's major goal is to link the filesharing process between teachers and students. Each class makes a unique folder on the user's Google Drive where students can turn in assignments to be graded by instructors. Google Calendar is updated with assignments and due dates, and each assignment is given a category or topic. By looking at the revision history of a document, teachers can simply keep track of each student's progress. Once

work has been graded, teachers can return it with comments and grades. With the aid of the Google form with the URL integrated in it, teachers can also administer quizzes. In addition to the asynchronous GCR, the extra Google Meet application (2019) provided the convenience of synchronous learning mode. As a result, the teacher can use the asynchronous mode to communicate directly with the class while teaching and holding a discussion before the pupils complete the task. In 2020, Google Classroom saw a substantial rise in usage as a result of the COVID-19 epidemic, which caused many schools without their own LMS to switch to GCR for remote learning. Google Classroom will have 150 million users in 2021. A private "class code" can be used to invite students to join a class, or students can be imported automatically from a school domain. These free asynchronous classroom apps may have also aided PjBL on ESP Material design, particularly as a tool for IT skill development and for online peer teaching simulations.

3 Method

The goal of this quantitative study was to determine how students felt about the project of designing ESP online materials and the impact of PjBL on students' 21st century skills. The study's focus was on students' opinions of PJBL in ESP class and their 21st century skills. 30 English Education Major students at Unversitas Teknokrat Indonesia who studied the English for Special Purposes course in the even semester from January to June 2022 served as the study's participants. A modified version of the twenty-item PjBL questionnaire developed by Ali, Sajid, Ayaz, and Asgher [16] served as the data collection tool. The students used Google Classroom to carry out the project, applying the ADDIE (analysis, design, develop, implement, and evaluation) methodology of online teaching. Here, they could work together by assuming the role of a teacher with peer students enrolled in their course. As a result, there were 30 instructor accounts with different ESP branches, 29 enrolling peer students, and one lecturer peraccount. This study highlighted collaboration, critical thinking (CThinking), and information technology abilities as the three key components of the project-based learning (PjBLearning) strategy (IT skill). In order to create a model of how PjBLLearning can influence students' 21st century skills, this study developed three assumptions (Fig. 1).

The following are the hypotheses:

- Hypothesis 1 (H1): PjBLearning has a major impact on collaboration.
- Hypothesis 2 (H2): PjBLearning significantly affects ITSkill.
- Hypothesis 3 (H3): PjBLearning significantly affectsCThinking.

Only 11 of the 20 total items on the students' impression questionnaire were actually connected to the study's two main topics, the PjBL and students' 21st century competencies. The other questions, which genuinely centered on elements like autonomy, motivation, and student engagement in their learning, were not addressed in this study. These fewer than 11 elements were therefore considered to be question indications. The question indicators that would be thoroughly investigated, examined, and discussed using SEM-AMOS data were displayed in Table 1.

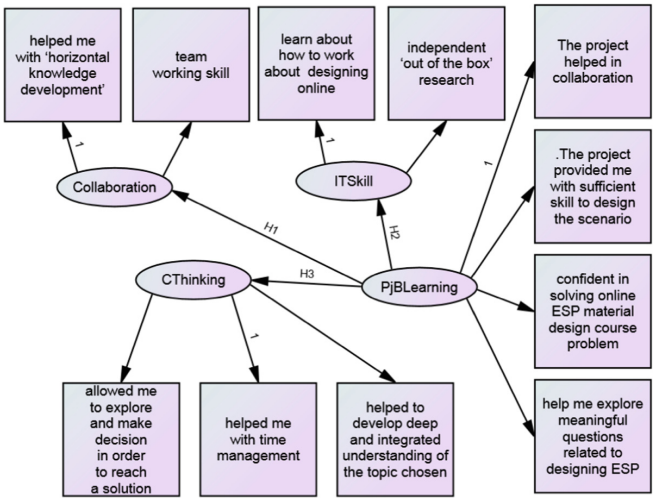

Fig. 1. Research Model and Hypotheses

Table 1. Questionnaire Indicators

Label indicator	Item Number	Question Indicator
col1	11	The project helped me with 'horizontal knowledge development' (skill not strictly part of the course, including soft skills)
Col2	12	The project helped me with team working skill
ct1	3	The project allowed me to explore and make decision in order to reach a solution
ct2	13	The project helped me with time management
ct3	18	The project helped to develop deep and integrated understanding of the topic chosen
its1	1	The Project provided me with motivation to learn about how to work about designing online ESP teaching Materials
Its2	6	The project encouraged me to do independent out of the box' research utilizing all resources (internet, library, seniors, study program, faculty, etc.) available to me
pjbl1	5	The project helped me explore meaningful questions related to designing ESP online teaching Materials

(*continued*)

Table 1. (*continued*)

Label indicator	Item Number	Question Indicator
Pjbl2	8	I am confident in solving online ESP material design course problem
Pjbl3	9	The project provided me with sufficient skill to design the scenario and the visual communication of a particular ESP online teaching material in the future
Pjbl4	20	The project helped in collaboration and sharing ideas with peers

4 Result

A. Result of Students' Esp Online Material Design on GCR

Following their analysis, design, and development of their chosen ESP online materials and evaluation on GCR using the ADDIE instructional model for online learning, students of English Education then shared the link and their class code to the ESP class WAG, allowing each student to play the role of teacher and the other 29 peers plus 1 lecturer to enroll as students for simulation. As a result, the project produced 30 ESP Classes on GCR, a sample of which can be shown in Fig. 2.

B. Factor Analysis of Esp Material Design Project Based Learning, Collaboration, Critical Thinking And It Skills

There were two primary groups of elements in the questionnaire. They were made up of the dependent variables of collaboration(col), information technology skills(its),

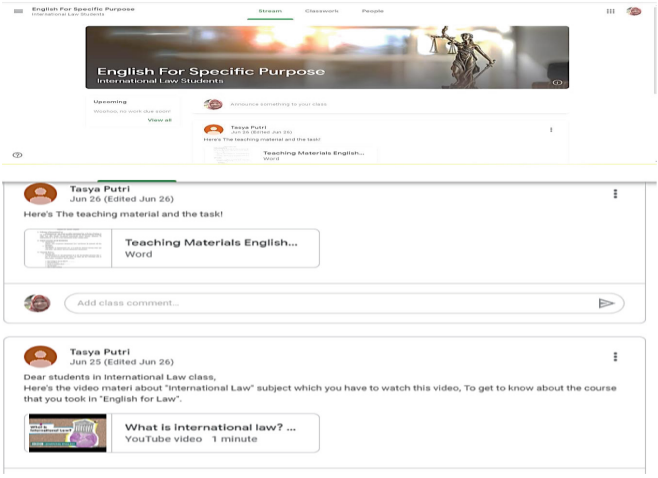

Fig. 2. Sample of ESP Students' GCR on English for International Law

and critical thinking(ct) as well as the independent factor of projectbased learning (pjbl). A structured questionnaire with a 5-point Likert-type scale was created and given to a sample of participants (11 items). The students' opinions on the various issues were gauged using the scores of 1 as severely disagree, 2 as disagree, 3 as neutral, 4 as agree, and 5 as highly agree. The study's findings, which can be shown in Fig. 3, related to how students perceived the project. It revealed that the majority of students endorsed project-based learning (pjbl1, pjbl2, pjbl3, pjbl4), with the following association indicators:

- Project-based learning (pjbl) has an advantageous impact on teamwork (col1, col2). ' 37% of students agreed that the activity helped them develop their "horizontal knowledge," and 43% strongly agreed. The initiative improved the pupils' ability to work in a team. With 43% in favor and 47% firmly in favor.
- The project-based learning (PBL) method improves information technology abilities (its1, its2). The project inspired the students to research and develop methods for creating online teaching materials for ESP. 47% strongly agree, 50% of respondents agree, and. The project gave me the confidence to conduct independent, "out of the box," research using all of the resources (the internet, the library, seniors, study program, teachers, etc.) at my disposal. With 43% in favor and 43% firmly in favor.
- The project-based learning (pjbl) methodology fosters critical thought (ct1, ct2, ct3). With 33% agreeing and 57% strongly agreeing, the statement "The project allowed student to investigate and make decisions in order to obtain a solution" is true. 47% of respondents agree and 37% strongly agree that the project helped the student manage their time. 43% and 53%, respectively, agree and strongly agree that "the project helped to build deep and integrated comprehension of the issue chosen."

C. Confirmatory Factor Analysis (CFA)

SEM-AMOS was the primary statistical method utilized in this study to assess the findings, which were based on confirmatory factor analysis (CFA) in AMOS 23TM. The convergent validity, one-dimensionality, consistency, and discriminant validity were all utilised in this mode. The highest probability estimation process with appropriate fitting strategies, such as chi-square, normed chi-square, normed fit index (NFI), comparative fit index (CFI), goodness-of-fit index (GFI), and root mean square error of approximation

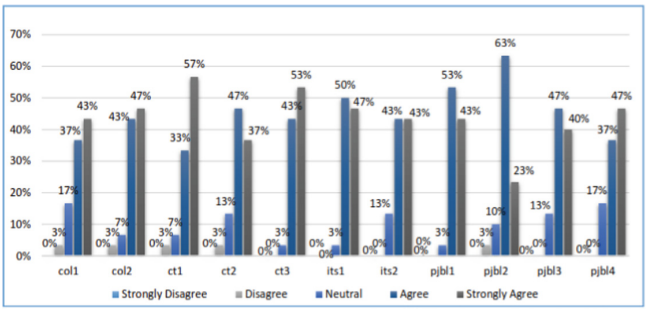

Fig. 3. Students' Perception on PjBL Graph

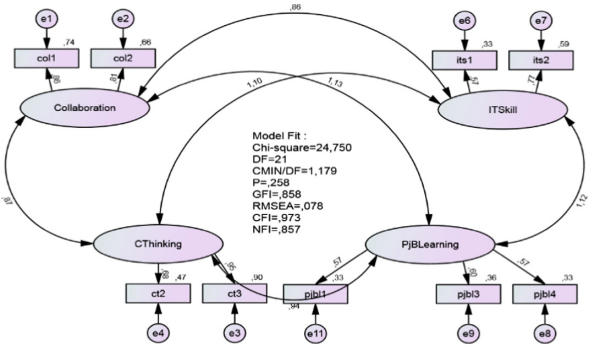

Fig. 4. Confirmatory factor analysis (CFA)

(RMSEA) must be used to evaluate the model [17]. The measurement model was reported in Table 2, and Fig. 4 summarized the fitting profiles utilized for the model evaluation.

Discriminant validity examines the degree of comprehension, taking into account several markers relating to distinct notions [18]. All values exceeded the criterion of 0.50 (AVE values), with a p value of.001, showing agreement of discriminant validity for all structures investigated [19]. The link between elements in different structures cannot be greater than the square root of the mean variance share in one of the structures, according to Hair et al. [17]. The generated composite reliability values are displayed, and it is clear that they fall within the acceptable range of 0.70 or higher.

Additionally, the AVE values are 0.50 or higher, as instructed, and the Cronbach's alpha values are in the range of the recommended value of 0.70 or higher.

Table 2. The Goodness of Model Fit

Type of Measure	Acceptable Level of Fit	Measurement 'CFA-Model	Structural 'Fit-Model
CMIN/DF	Value should be decrease	1.179	1.039
P (probability)	Value should be $\geq$ 0.05	0.258	0.411
GFI	Value should be $\geq$ 0.9	0.858	0.887
RMSEA	Value $<$ 0.10 means a good fir, and	0.078	
	$<$ 0.05 indicates a very good fit.		0.036
CFI	Value should be $\geq$	0.973	0.995
NFI	Value should be $\geq$ 0.9	0.857	0.891

D. Structural Model Analysis

Using path modeling analysis, all outcomes for PjBL, Collaboration, Information Technology, and Critical Thinking skills were provided. In the explanation of the hypothesis test, the results were also contrasted. The findings revealed a strong relationship between the PjBL method and Collaboration, as shown in Fig. 5 and Table 3 (= 0.514, t = 3.530, p 0.001), supporting the first hypothesis (H1). The findings revealed a relationship between the PjBL approach and information technology skill, as shown in Fig. 5 and Table 3 (= 0.336, t = 3.078, p = 0.002), supporting the second hypothesis (H2).

Although there is a positive connection, the second hypothesis was not supported by it because the association's p value of 0.002 makes it insignificant. Last but not least, Fig. 5 and Table 3's results for the correlation between PjBl and critical.thinking showed a positive and significant correlation for the third hypothesis (H3) to be concluded as supported: (= 0.382, t = 3. 311, p0.001).

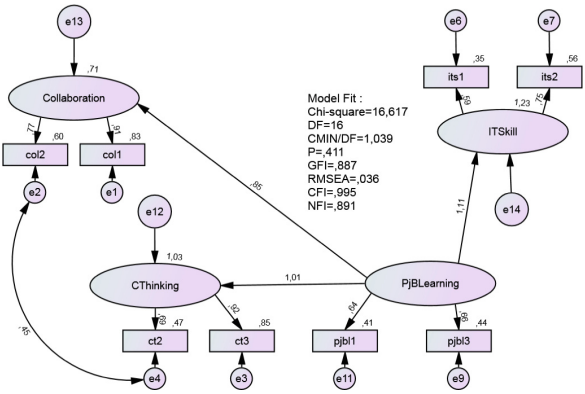

Fig. 5. Structural Model and Hypotheses Testing

Table 3. Hypotheses Testing

Hypothesis	Independent	Relationship	Dependent	Estimate	C.R.	P	Result
H1	PjBLEarning	→	Collaboration	0.514	3.530	***	Supported
H2	PjBLearning	→	ITSkill	0.336	3.078	0.002	Not Supported
H3	PjBLEarning	→	CThinking	0.382	3.911	***	Supported

Note: CR = Critical Ratio or t-value; PjBLearning = Project-Base Learning; ITSkill = Information Technology Skills; CThinking = Critical Thingking ***p < .001

5 Discussion

A. Project Based Learning, Bloom's Revised Digital Taxonomy, and 21 Century Skills Development

Students went through the following steps as they worked on the project-based learning goal of generating ESP online materials: 1) They registered their peers as pupils while simultaneously creating a teacher account on GCR; 2) They carried out the ADDIE steps of designing an online ESP course, which involved analyzing the simulated ESP needs, designing the ESP online course in a lesson plan, developing the ESP material with the aid of a story board, implementing the developed material content by uploading on the GCR, and evaluating the entire process and product through peer evaluation.

Churches actually noted that a PjBL task, in this case, this ESP material design project through GCR, was a form of Blooms' highest cognitive level "creating," such as generating/creating new ideas, products, or ways of viewing things (Putting together/combining ideas, concepts, or elements to develop/construct/build an original idea or engage/stimulate in creative thinking), and of Blooms revised digital taxonomy "creating," where students conduct digital creation activities [20].

Churches went on to say that collaboration is both featured as a separate aspect and shared in some elements. Digital collaboration can take on many different forms (coordinating, negotiating, debating, commenting, net meetings, skyping, video conferencing, reviewing, questioning, posting, networking, contributing, chatting, emailing, twitting, texting, and instant messaging), and its value can vary greatly. This frequently holds true regardless of the method of collaboration. Additionally, teamwork is not an essential component of an individual's learning process. While students are not required to cooperate when they are learning, doing so frequently makes learning more enriching and engaging. Collaboration is a 21stcentury talent that is getting more and more attention and is employed all through the educational process. It can take on the shape of a Bloom's element in some cases, or it can just be a tool that can be utilized to encourage higher order thinking and learning. This ESP material design project and GCR simulation went through numerous rounds of student communication and teamwork to produce 30 asynchronous ESP simulated virtual classrooms with a variety of chosen ESP teaching materials and 29 peer students who were required to enroll in each.

B. PjBL and IT skill

IT abilities are knowledge of computers and software. They combine hard capabilities and soft skills. These include interpersonal abilities like communicating, persistence, and project management, as well as technical skills like coding, problem solving, creativity, and analytical skill [21]. The result of hypothesis test 2 clearly demonstrated that there was no significant association between PjBL and IT skill, which is clearly explained by this extremely complex skill notion.

For common users of IT stuffs such as English Education students, they regard their IT skill as not so sophisticated and still in the process of learning how to do as seen on the result of item number 1, "the project provided me with motivation to learn about how to work about designing online ESP teaching materials" and item number 6" the project encouraged me to do out of the box research utilizing all resources internet,

library, seniors, study program, faculty, etc. available to me" and number 9" the project provided me with sufficient skill to design the scenario of a particular ESP online teaching material in the future, all of which showing their point of view of their 'sufficient' self-capacity regarding IT skills, in that they recently began to practice using the story board app and google classroom app on the role of a teacher user of IT stuffs in a similar sense to that of common social media users, not like that of professional IT technicians.

Future study may be interested in looking at how general English education students perceive their IT skills and how English education students' IT skills are classified, as well as the motivation, engagement, and autonomy associated with the ESP project-based learning paradigm.

6 Conclusion

To sum up, PjBL was well received by English Education students who enrolled in the ESP course in that it aided them in learning the course's content as well as in practicing to be ESP teachers, particularly in creating the ESP material and simulating material delivery through an asynchronous mode like Google Classroom. Through the process of filling the ESP content material on GCR, starting from need analysis, designing and lesson planning, developing the material, uploading the content, and evaluating the whole parts, they were truly trained to improve their collaborative and critical thinking skills as well as those of the "Profil Pelajar Pancasila characters" (mandiri, berfikir kritis, kreatif, and bergotong royong).

This project has pushed English Education students to be comfortable users of online teacher programs like Storyboard and Google Classroom even though it is not encouraged in order to prepare them to be English teachers for online students in the future. The encouraging good news is that, if they are proficient in utilizing the asynchronous software to teach English, they have the option of working in a different profession in addition to teaching English. They can aim to become an ESP edu- preneur, the ESP education content developer in the digital age, since teaching will eventually no longer require a physical classroom.

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