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MODEL OF PROJECT-BASED AND COGNITIVE COMPETENCIES-INFUSED LEARNING IN THE GRAMMAR CLASS OF ELESP

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Abstract
Model of learning is a guideline that teachers will use to let their teaching more comprehensive and practical to facilitate the achievement of the learning goal. A dynamic approach suited to teaching in which students explore real-world problems and challenges, simultaneously developing 21st-century skills while working in small collaborative groups is Project-Based Learning. The purpose of the study is to analyze the used model of Project-Based and Cognitive competencies-infused learning in the grammar class of English Language Education Study Program. This study employed a qualitative design where the data are the components of the existing models of learning in grammar classes of English Language Education Study Program. Besides, online class observation and grammar class syllabus documents are used as instruments. The findings of analysis revealed that Methods that generally used in the online class observation are *Computer-Assisted Instruction (CAI), Scaffolding, Reciprocal method, Cooperative Learning* while mostly used *Lecturing, General Discussion, and Presentation* to delivering material. The indicator that could be seen in syllabus document and class observations was *Critical Thinking* from Cognitive competences indicators. The Project-Based Learning indicators could also be seen directly from syllabus documents and online class observations. *Intellectual Challenge and Accomplishment* was mostly dominated seen in the model**.**

Keywords: model of learning, project-based learning, cognitive competencies, grammar

1. INTRODUCTION

Students now live in an interconnected, diverse, and rapidly changing world (OECD 2018) where the role of education becomes important in preparing the next generation to have learning and life skills since the development of innovation and technology occurs rapidly. According to (Luna 2015) for UNESCO, it leads to the acquisition of skills and knowledge needed by students to survive and succeed in the 21st-century. However, a key challenge in bringing desired improvements lies in the lack of context-specific understanding of teaching practices and meaningful ways of supporting teacher professional development (Kim, Raza, and Seidman 2019). This encourages teachers to look for a suitable model of learning since the teaching and learning process will be ineffective without it. (Behar-Horenstein and Seabert 2012).

Model of learning that enhances century skills should be student-centered learning where problems encountered in students' daily lives can be used as learning topics. It is intended

to apply the concepts of knowledge that students have acquired into the real matter (Saavedra et al. 2012). Model of learning represents a learning environment that has many uses, ranging from planning curriculums, courses, units, and lessons to designing instructional materials, multimedia, programs, and computer-assisted learning programs (Joyce, Weil, and Calhoun 2015). There exist many popular learning models, nonetheless, one of the dynamic approaches suited to teaching in which students explore real-world problems and challenges, simultaneously developing 21st-century skills while working in small collaborative groups is Project-Based Learning (J. Stivers and Brandon 2010).

Project-Based Learning is known as a powerful way to learn new things and remember them for a long time. The general concept of the model is having students actively engage in deeper learning about things in their community and doing meaningful projects to give them the ownership of learning (Buck Institute for Education 2019). It also allows students to be active and work together with their peers during the learning process (Mislena, Erlina, and Anggraini 2020). Another point of view comes from (High Quality Project Based Learning 2017) that Project-Based Learning is a critical teaching method that enables students to improve academic skills and content knowledge, gain essential skills for career achievement, and develop the personal agency necessary to tackle life's and the world's challenges.

The National Academy of Sciences recently defines the skills necessary for success in the 21st-century as falling into three domains, such *as intrapersonal, interpersonal, and cognitive.* In cognitive competencies, critical thinking, problem-solving, and decision-making are vital component skills as the basis to the common core learning standards. Since those skills are beneficial to prepare students for the fast-moving future for college and careers (NYSUT 2015). Afterward, it needs to teach students how to think on their own for creating individuals and be fully responsible for their experience of creating meaning from extensive ideas (Budgen 2007).

Meanwhile, Indonesia's government found English to be the most significant foreign language. Therefore, English is treated as a compulsory foreign language subject that students must learn from elementary school to university (Sari 2016). One of the content subjects in English Language Education Study Program that needs to be considered is grammar. (Gerot and Wignell 2010) suggest that students who study a language at a higher educational institution are necessary to master four English skills. Moreover, (Purnawati and Iskandar 2019) claim that grammar is language awareness that influences the four language skills by affecting the properness of students writing and speaking as well as students understanding of learning activities. However, (Hudson 2005) argues uninteresting lessons of grammar make a counterproductive sense towards grammar teaching and learning.

Prior studies of Project-Based Learning were plenty and available. Some studies related to Cognitive competencies-infused learning for teaching and learning EFL is available as well. However, developing the model of Project-Based and Cognitive competencies-infused learning in the grammar class of English Language Education Study Program is not available.

Research Question

The research question is to what extent does the existing model of learning in grammar class of English Language Education Study Program employ Project-Based Learning and accommodate Cognitive competencies?

Purpose of the study.

In line with the research questions, therefore, this study's purpose is to analyze the used model of Project-Based and Cognitive competencies-infused learning in grammar class of English Language Education Study Program. The model needs to be analyzed to fill the gap of the prior research.

2. LITERATURE REVIEW

2.1. Model of Learning.

Model of learning describes as a systematic procedure in organizing learning experiences to achieve specific learning objectives and serves as a guide for students and teachers in applying more comprehensive and practical learning activities. However, a model of learning cannot provide all actions by a teacher (Wilson and Peterson 2006; Eggen and Kauchak 2012).

Model of Learning Components.

Model of learning is one of the important components in learning (Asyafah 2019). Model of Learning components from (Anthony 1963), (Richards & Rogers, 1986), (Brown 2000), and (Harmer 2011) theories, it can be concluded that **approach** is the basis of language learning that derive from the theory of language, the theory of language learning, and it serves as the source of practices and principles of teaching and learning activity to aim the goals. Furthermore, the **method** is the practical realization of an approach. Finally, **technique** is the actual moment-to-moment classroom steps, any kind of actual activities, and exercises that are necessary to complete a task in the classroom and consistent with an approach.

Model of Learning Approaches and Methods.

Based on Cruickshank et al., 2006, the model of learning components is called three major *Schools of Thought*, which consist of the cognitive, humanistic, and behavioral approaches. Each ***approach*** has a significant perspective leading to some ***methods***, then methods lead to ***techniques***.

A. Cognitive Approach.

Cognitivism is interested in how knowledge is acquired. This approach centered on *Information processing* and *Meaningful Learning* referring (Cruickshank et al. 2006).

The Cognitive Approach has some *methods* as follows.

a. Authentic Learning gives students tasks requiring them to learn directly from their environment to gain real-life experiences. It suggests knowledge is more meaningful and retained longer when it can be related to student's world *b. Scaffolding* supports students when they need guidance. (Lai & Kwok, 2004) similarly stated scaffolding facilitates a student's ability to build on prior knowledge and internalize new information. c. *Reciprocal Teaching* is an instructional activity during which a dialogue takes place between teacher and students. The teacher gradually shifts teaching responsibility to students (Seymour and Osana 2003). *d. Problem-Solving* requires a situation that exists in which a goal is to be achieved and students are asked to consider how they attain the goal by the problematic situation.

B. Humanistic Approach.

Humanistic proponents are interested in *personal development, the self, and the way feelings, attitudes, and values are required*. It suggests learning improves in a classroom that is more humane and the school is made to fits the students (Cruickshank et al. 2006).

The Humanistic Approach proposes some *methods* as follows

a. Cooperative learning promotes social and emotional growth where students share, accept, and respect each other. This method entails students cooperating in a small group setting and are usually praised for their collective efforts as cited in (Cruickshank et al. 2006). *b. Inviting School Success* refers to activities such as teachers knowing students' names, having individual contact with each student, teachers showing respect to them, being honest with student. *c. Values Clarification* is a technique by which students recognize what they believe about something, and then teachers value that feeling so that students become aware of the values they hold *d. Moral Education* refers to character, values, and citizenship education. Teachers serve as role model who are respectful and caring of others. *e. Multiethnic Education* is an educational practice encouraging students to respect their roots and culture-ideas, customs, skills, arts, and diversity etc.,

C. Behavioral Approach.

Behaviorists are interested in how the environment can be manipulated to encourage learning behavior in a desirable direction. This approach highlights contiguity, classical conditioning, and social or observational learning as means to behavioral change (Cruickshank et al. 2006)

The Behavioral Approach formulates some *methods*

a. Direct Instruction (DI) is an instruction that is dominated by teachers. They present information by using many illustrations for reinforcement, asking students many questions to check to understand and providing corrective feedback, giving lots of practice, and ensuring learning by keeping students on task for as long as it takes. *b. Programmed Instruction (PI)* is organizing materials to be learned or practiced in small parts called frames. *c.Computer-Assisted Instruction (CAI)* is using computers to present programmed instruction or assist students with specific learning tasks. *d. Mastery Learning* is allowing students to learn academic material at their own pace. *e. Precision Teaching (PT)* is continuing practicing skills until students achieve a high level of precision or fluency. *f. Applied Behavioral Analysis (ABA)* is modifying the behavior of students toward more acceptable patterns.

2.2 Project-Based. Project-Based Learning is an instructional approach built upon learning activities and real tasks that have brought challenges for students to solve. It has been proven to be effective since it allows students to play an active role, reflects upon their ideas, and accomplish meaningful projects. The final product results in high-quality, authentic products and presentations. (Guo et al., 2020; Billah et al., 2019; Shin 2018; Jumaat et al. 2017; Hong & Yam, 2010; J. Stivers and Brandon 2010).

This study uses The (High Quality Project Based Learning 2017) framework that is purposed to encourage reflection and conversation on how to improve and deepen the project. The concept of the HQPBL is discussed as follow: 1. **Intellectual**

Challenge and Accomplishment defines Students learn deeply, think critically, and strive for excellence). 2. **Authenticity** defines students work on projects that are meaningful and relevant to their culture, their lives, and their future). 3. **Public Product** defines Students' work is publicly displayed, discussed, and critiqued). 4. **Collaboration** defines students collaborate with other students in person or online and/or receive guidance from adult mentors and experts). 5. **Project Management** defines Students use a project management process that enables them to proceed effectively from project initiation to completion). 6. **Reflection** defines students reflect on their work and their learning throughout the project.

2.3 Cognitive Competences. In Cognitive competencies, critical thinking, problem-solving, and decision-making are inseparable components (Koenig 2011); (Sun and Hui 2012); (Laia and Iskandar 2020). These three competencies are described as follow: **Critical Thinking** is the application of reason in the determination of whether a claim is true, it should be part of student's learning and schools should be responsible to develop and evaluate critical thinking skills through the teaching and learning process (Moore & Parker, 2009, Firdaus et al., 2015). Next, **Problem-Solving** is fundamental to success in life. It is not a single skill, but rather an overlapping of some thinking skills, including logical thinking, lateral thinking, synthesis, analysis, evaluation, sequencing, decision-making, research, and a prediction that the pupils could need a different time for the resolution (Pallavi 2006); (Carson 2007); (Dostál 2015). Similarly, (Pisa 2012); (Kusdinar et al. 2017) defined problem-solving competence as a capacity to engage in cognitive processing to understand and resolve problem situations where a method of solution is not immediately obvious. Lastly, **Decision-Making** is a thoughtful process of choosing among a variety of options for acting or thinking (Freeley et al., 2009). Likewise, (Turpin and Marias 2004) stated it is about dealing with the irrationalities and uncertainties of a problem. The important part of decision-making is judging what does and does not matter: what is and is not important (Butterworth J., 2013, p. 279). (Cuesta College, 2020) stated decision-making is a process of identifying and evaluating choices that create impacts. To summarize, three competencies are forms of reflective thinking (Butterworth J., 2013).

2.4 Grammar According to (Wignell, 2010; Rama & Agulló, 2012) grammar is a theory of language, of how language is put together and how it works. (Harmer 2011) argued that grammar is a description of how words can change their forms and can be combined into sentences in that language. In the same statement, (Keck and Kim 2014) defined grammar as a system of rules which govern how words (and smaller morphemes) can be combined to form sentences. While (Brown 2007) stresses that without grammatical structure, the use of language could easily become chaotic and might not be understandable. More recently, (Larsen-Freeman and Celce-Murcia 2016) stated that grammar is a meaning-making resource made up of grammatical form, meaning, and use constructions that were appropriate to the context and that operate at the word, phrase, sentence, and textual level. Meanwhile, English Language Study

Program (ELESP) is a study program for a bachelor's degree designed for a prospective teacher. It implies the understudies of English Language Study Program are in-service teachers of English adult students. Furthermore, in the Grammar subject in English Language Study Program has generally acquired 9 credits which are divided into three levels, they are *Basic, Intermediate, and Advance* level. This statement is line with Common European Framework of Reference.

2.5 Previous Study Some studies have been conducted related to this research:

1. (Chikita, Nyoman, and Wayan 2013). The finding revealed that Project-Based Learning has a positive effect on students' **writing** competency.
2. (Nurcahyoko 2014). The finding showed that both techniques are effective to improve students' **grammatical accuracy** for high and low-motivated students.
3. (Kornwipa Poonpon 2017). The results of the study revealed how the interdisciplinary-based project should be implemented in a language classroom to enhance the learners' English skills.
4. (Putri 2018). The result found that that using Project-Based Learning encouraged students to participate actively in the learning process, for example, discussing in a group, asking questions, sharing ideas, etc.
5. (Jusmaya and Efyanto 2018). The analysis showed that critical thinking skills can be increased by using the Project-Based Learning' method.
6. (Kaunang 2018). The findings showed that Project-based learning could improve the students' **speaking skill**, it is suggested to use this method in teaching speaking skill.

Prior studies of Project-Based Learning were plenty and available. However, the model of Project-Based and Cognitive competencies-infused learning in the grammar class of English Language Education Study Program is not available.

3. RESEARCH METHOD

This chapter provides the methodology of how this research is carried out. According to Creswell research design is plans and the procedures for research to detailed methods of data collection and analysis. This study applied a *qualitative approach* because this study focuses on the analysis of the material in context.

Some data were needed to analyze a model of learning. The data are the explanation about the model of learning components (approach, method, and technique) of the existing models of learning in grammar class of English Language Education Study Program through online class observation, and grammar class syllabus documents from four universities. Data sources are lectures and students English Language Education Study Program in grammar classes at four universities, the existing grammar syllabus, the literature review of the Project-Based model of learning and Cognitive-competencies into grammar syllabus, and online classroom observation in the form of video recording. The instruments are the researcher, video recording, and table of analysis including the model of learning components, Project-Based, and Cognitive competencies indicators and descriptors.

Several steps applied in conducting data collection procedures: 1) Doing library research to explore, collect, and theories related to the model of learning, Project-Based Learning, Cognitive competencies, and Grammar. 2) Doing online class

observation in grammar classes from four universities. 3) Collecting and analyzing syllabus documents based and indicators and descriptors. 4) Finding the differences and gaps between the existing models of learning, syllabus document and online class observation, and the theories as well. 5) Describe the findings of the analysis.

The data analysis procedures that involve are: 1) The researcher created tables for analyzing the use of Project-Based and Cognitive competencies-infused into the existing models of learning in reading classes of English Language Education Study Program in order to find the gap and answer the first research-question. 2) The data analysis findings of the existing models of learning are presented 3) The conclusion of the existing models of learning are summed up in the existing models of learning. The data were gained from several meetings of online class observation and six syllabus documents of grammar classes from four universities. The following table shows the list of universities and online class observation:

University	Course Name	CEFR Level	Code	Online Class Observation	Syllabus Documents
University A	Basic English Grammar	A2	UA1	-	√
	Advanced English Grammar	B1	UA2	5x	√
University B	Intermediate English Grammar	B2	UB1	1x	√
	Advanced English Grammar	C1	UB2	5x	√
University C	Basic English Grammar	A2	UC1	1x	√
University D	Grammar in Spoken and Written Discourse (Functional Grammar)	B1	UD1	3x	√

4. RESULT AND DISCUSSION

The Use of Project-Based and Cognitive competencies-infused into the existing models of learning in grammar classes of English Language Education Study Program

After formulating and analyzing the data descriptively, it was found that findings the components found in the existing model of learning are in terms of *Approach, Method, and Techniques* from library research. The analysis result of the components of the existing model of learning; the analysis of using the model of Project-Based and Cognitive competencies-infused learning in the existing models of learning components will be explained in the next part:

- **University A**

  The Existing Models of Learning, the Project-Based Learning Indicators and Cognitive Competencies Indicators in University A.

Based on syllabus documents of Basic English Grammar and Advanced English Grammar classes and online observation in Advanced English Grammar class, it could be concluded that the model of teaching employed for the classes were *Computer-Assisted Instruction (CAI)* and *Direct Instruction* from the *Behavioral Approach*. Moreover, the model of learning employed for the Advanced English Grammar class was *Reciprocal Teaching* from the *Cognitive Approach*. Then, the technique that was mostly implemented in learning activities was *lecturing* and *general discussion* as well.

The Project-Based Learning indicators could be seen directly from syllabus documents and online class observations. The Project-Based Learning indicators that appeared in

syllabus document and online class observations were dominated by *Intellectual Challenge and Accomplishment* (ICA) indicator.

The Cognitive indicators could be seen directly from syllabus documents and online class observations (the observation only happened in the Advances English Grammar class). The Cognitive indicators that appeared in syllabus document and online class observations were dominated by *Critical Thinking* (CT), and followed by *Problem*-Solving (PS), and the last rank was *Decision-Making* (DM).

- **University B**

  The Existing Models of Learning, the Project-Based Learning Indicators and Cognitive Competencies Indicators in University B.

According to syllabus documents of Intermediate English Grammar and Advanced English Grammar classes and online observation in Advanced English Grammar class, it could be summarized that the model of teaching employed for the classes was *Computer-Assisted Instruction (CAI)* from the *Behavioral Approach*. Besides that, *Cooperative learning* from the *Humanistic Approach* employment were clearly appeared in the Learning Activities while doing the presentation tasks. Thus, the technique that was mostly appeared in learning activities were *group presentation* and *general discussion*, besides a little *lecturing* also seen only in the first observation for giving direction.

The Project-Based Learning indicators could be seen directly from syllabus documents and online class observations. The Project-Based Learning indicators that appeared in syllabus document and online class observations were dominated by *Intellectual Challenge and Accomplishment* (ICA) indicator.

The Cognitive indicators could be seen directly from syllabus documents and online class observations (the observation only happened in the Advances English Grammar class). The Cognitive indicators that appeared in syllabus document and online class observations were dominated by *Critical Thinking* (CT), then followed by *Problem*-Solving, and the last position was *Decision-Making*.

- **University C**

  The Existing Models of Learning, the Project-Based Learning Indicators and Cognitive Competencies Indicators in University C.

Based on syllabus document of and online observation in Basic English Grammar class, it could be stated that the model of teaching employed for the class was *Computer-Assisted Instruction (CAI)* from the *Behavioral Approach*. Moreover, *Cooperative learning* from the *Humanistic Approach* employment was written in Learning Outcomes. It was also clearly appeared in the Learning Activities. Besides, *Scaffolding* from the *Cognitive Approach* was also implemented in this class. Then, the technique that was mostly implemented by the teacher and students both in learning activities and clearly written in syllabus documents were *lecturing, group presentation, general discussion, and observation.*

The Project-Based Learning indicators could be seen directly from syllabus documents and online class observations. The Project-Based Learning indicators that appeared in syllabus document and online class observations were dominated by *Intellectual Challenge and*

Accomplishment (ICA) indicator. Whereas *Project Management* (PM) was not employed at all.

The Cognitive indicators could be seen directly from syllabus documents and online class observations (the observation only happened in the Advances English Grammar class). The Cognitive indicators that appeared in syllabus document and online class observations were dominated by *Critical Thinking* (CT), and followed by *Problem*-Solving (PS), and the last placed was *Decision-Making* (DM).

- **University D**

  The Existing Models of Learning, the Project-Based Learning Indicators and Cognitive Competencies Indicators in University D.

According to syllabus documents and online class observation of Grammar in Spoken and Written Discourse class in University D, it could be concluded that the model of teaching employed for the classes was *Computer-Assisted Instruction (CAI)* from the *Behavioral Approach*. Besides that, *Cooperative learning* from the *Humanistic Approach* employment were clearly appeared in the Learning Activities while doing the presentation tasks. Then, the technique that was mostly implemented in learning activities by the teacher and students were presentation and general discussion

The Project-Based Learning indicators could be seen directly from syllabus documents and online class observations. The Project-Based Learning indicators that appeared in syllabus document and online class observations were dominated by *Intellectual Challenge and Accomplishment* (ICA) indicator and followed by *Reflection* (R) and *Public Product* (PP) indicator. While, *Authenticity* (A), *Collaboration* (C), *and Project Management* (PM) were the slightly employed indicators that could be seen from the frequency numbers

The Cognitive indicators could be seen directly from syllabus documents and online class observations (the observation only happened in the Advances English Grammar class). The Cognitive indicators that appeared in syllabus document and online class observations were dominated by *Critical Thinking* (CT), then followed by *Problem*-Solving, and the last position was *Decision-Making*.

5. CONCLUSION

After accomplishing the study analysis, it found the gaps of Cognitive competencies and Project-Based employment in the existing syllabuses. The research question was to analyze the use of Project-Based and Cognitive competencies infused into the existing models of learning in grammar classes of English Language Education Study Program. It was found that the Cognitive indicators could be seen directly from syllabus documents and online class observations. From the syllabus document, the Cognitive indicators were mostly infused in the components of Learning Outcomes, Learning Objectives, Teaching Method, Learning Activities, Learners' Task, both explicitly and implicitly. From class observation, the indicators that were mostly infused in the learning and teaching activities was *Critical thinking* from Cognitive competencies indicators. Meanwhile, the Project-Based Learning indicators also emerged directly from syllabus documents and online class observations. From the syllabus document, the Project-Based Learning indicators were mostly infused

in the components of Learning Outcomes, Learning Objectives, Teaching Method, Learning Activities, and Learners' Task. From class observation, the Project-Based Learning indicators were infused are *Intellectual Challenge and Accomplishment indicators* and *Collaboration* indicators. However, further research in developing a model of Project-Based and Cognitive infused learning in grammar classes of English Language Study Program is suggested in order to get more comprehensive and practical learning process.

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