Project Based Learning (PjBL) as Approach in Scientific Writing

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Abstract. Writing is the most difficult skill compared to other language skills. Students frequently experience obstacles in scientific writing. An implementable approach for scientific writing is Project based Learning (PjBL). Students conduct investigations and create a product. This paper aims at explaining the PjBL approach in scientific writing. This type of research uses critical analysis covering 5 elements of the theory of Harold D. Lasswell, namely: who, states what, for whom, what media, and its influence. Furthermore, these 5 elements are described to examine the PjBL concept in scientific writing. PjBL is summarized as deep learning, concentrating on real world issues and challenges. Students work in groups through several steps of meaningful activity and produce a final product. PjBL learning is suitable in scientific writing because PjBL benefits support the attitudes needed in the writing process, including: active, reflective, collaborative, solutive, predictive, affective, responsible, intellectual, social, and communicative.

Keywords: learning approach, pjbl, scientific writing

1 Introduction

Students are required not only to have knowledge (cognitive) competencies but also skill competencies (skills). Learning Outcomes according to Presidential Regulation No. 8 of 2012 concerning KKNI are abilities obtained through internalization of knowledge, attitudes, skills, competencies, and accumulated work experience. The description contains a description of the outcomes of all educational processes, both formal, non-formal, and informal, namely an internalization process and the accumulation of four main parameters, namely: (a) Science, or knowledge and practical knowledge (know-how), (b) skills, (c) affection and (d) work competence.

One form of language skill is writing. In language skills, writing is the most difficult skill compared to the other three skills (listening, reading, and speaking). Research conducted by Terenin [18] in Russia revealed the failure of Russian English learners to write. Many graduates of Russian Universities have successfully passed tests of grammar or vocabulary proficiency, but are less successful when they are challenged to do composition. It's important to note that the biggest stumbling block in student writing is rhetorical: grammatical accuracy, lack of

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compositional clarity, lack of unity and strength, flawed cohesion, flawed coherence, and all other rhetorical weaknesses.

Another study by Stapa Malaysia [18] found that inexperienced ESL academic writers at local universities in Malaysia had problems writing introductory research proposals. After the question has been identified, students are introduced to a method of academic writing called the genre method. By using this approach, the problem of writing an initial research plan can be minimized.By using this method, students can write a clearer and more effective introduction. This approach will later be implemented in the teaching of research methodology courses offered by the Faculty of Languages and Linguistics.

According to the second study, a solution is needed to overcome difficulties in writing, namely by using the proposal writing method. Proposal writing is part of scientific writing.

This article focuses on scientific writing. Pollock [15] revealed that scientific writing is a highly structured form of writing. Required items include appropriate expected components; clarity of intent; methodology with sufficient detail to reproduce the study; fair and objective presentation of results; and interpretation based on a reasonable assessment of available evidence, current knowledge, and known professional limitations. Equally important are the things to avoid in scientific writing: hyperbole, hyperbole, logical inconsistency, selective reporting of findings or interpretation to change conclusions, and any other form of intentional bias.

The process of scientific writing is very systematic. Therefore, it takes a special approach in learning. One approach that can be taken is PjBL. project-based (PjBL) is one approach that can be applied in scientific writing. As a result of Vogler's research, Jaane S., et al. [19] conducted this two-year qualitative study, by exploring the learning process and student perceived outcomes through interdisciplinary project-based learning (PjBL) assignments. Students from three different undergraduate programs are assigned as a team to a project across three classes. The existence of reviews of reflective journals and focus groups adds broad insight into the learning experience from the perspective of a student. In the first year, it was found that a student can use his abilities such as in communicating, working together and can argue that innovations must be made in the course. In the second year, it was discovered that the development of soft skills and hard skills such as the ability to program, design, and conduct research in the market. As a whole, this study focuses on interdisciplinary traits that such as existing that can support an important part of student learning that will not be carried out in classes in general. In addition to this, research was held to focus on the benefits of interdisciplinary collaboration between teachers at the time of designing the PjBL experience to encourage students to cross interdisciplinary boundaries.

PjBL according to Guo [9] is said to be an effective method in improving learning. An empirical review of project-based learning results in affective effectiveness for students, namely the many benefits that can be obtained from the use of PjBL. The data was obtained through research by providing questionnaires, conducted interviews, observations, and the existence of a reflection journal. Cognitive effectiveness is indicated by the knowledge and individual skills possessed by students. The data was obtained through tests, interviews, rubrics, artifacts, and others. The researcher hopes that in the future further research will be able to explore in-depth findings on the student learning process and the final product of students.

Based on Guo's research suggestions [9], future research should further investigate student learning processes and the final product. Therefore, this article discusses PPA as a method to produce products in the form of scientific works in the study of scientific writing. Through PjBL steps, students can create scientific writing products. The impact of PjBL reviewed by Chen and Yong [7] revealed that there was an increase in academic achievement at every school level in students. This is because PjBL invites students to learn actively in a real project and carry out the process of developing a product. As such, the project is based on group work and active learning.

Based on the description above, this paper aims to explain PjBL as an approach in scientific writing. In the learning process, students are involved in working on authentic projects and product development.

2 Research Methods

This research is descriptive literature analysis that reveals the data with the help of several references: books, articles, and other documents. This type of research uses critical analysis covering five elements of the theory made by Harold D. Lasswell, namely: who states what, for whom, what media, and its influence. Furthermore, the five elements are described to explain Project Based Learning (PjBL or PBL) in scientific writing.

3 Result and Analysis

Project Based Learning (PjBL) and Excellence in Scientific Writing

Project-based learning supported by technology is a strategy that can reduce traditional learning. Students learn and engage in the real world (projects). Students will gain experience. The role of the educator is shifting. Educators are no longer content experts, sharing knowledge in mosaics. Students also have different roles, sometimes following the teacher's instructions, but also pursuing their products. Suzie and Jane Krauss [5] state that class boundaries have changed. Teachers still design projects as learning frameworks, but students may use technology to access and analyze information from all corners of the world. Connections between students and experts can occur in real-time. That means a new kind of learning community can come together to discuss, debate, and exchange ideas.

Students who are involved in project learning benefit, namely (1) the project is included in the curriculum not as an additional activity, (2) students can implement theory into a real practice, (3) students are forged to be able to solve problems collaboratively, (4) learning becomes more meaningful and has a high essence because it is supported by adequate technology, (5) teachers are increasingly eager to carry out collaborative activities in planning and implementing projects.

From the explanation above, it is concluded that the implementation of PjBL in scientific writing can help solve problems in problem formulation by real findings, implement theory or science to conduct investigations with open questions, and produce products in the form of scientific

writing. In the process, this can be done by collaborating and optimizing the use of technology to communicate.

PjBL Research in Various Countries

It was mentioned in the previous paragraph, that Project-based learning (PjBL) is an effective approach to involve students or activate students. This is like the results of studies conducted by the following experts.

First, research was conducted by Almulla, [1] at Raja Faisal University (KFU). It is revealed that many universities encourage the PjBL approach. The main purpose of this research is to analyze and develop the efficiency of PjBL learning that is applied to students. Data was collected through filling out a questionnaire. Questionnaires were distributed to 124 teachers who used the PjBL approach. As a result, this PjBL method increases student participation in discussions about science or information. PjBL is also synonymous with learning that uses students' abilities in terms of memorizing and understanding. Based on the results of research by Hawa, et al. [10] learning is often boring and seems rigid because teachers tend to only use rote learning methods. Sociology of literature learning materials have not been able to master students rationally, cognitively, emotionally, and affectively. Lastly, Almulla highly recommends the PjBL approach for use in universities.

In Almulla's study [1] there are 5 main aspects in carrying out the PjBL approach, namely collaborative learning, learning focused on skill disciplines, repetition of learning, authentic learning. In this study, the development of 11 hypotheses that can affect student participation in the PjBL approach will be carried out. In the end, there was a positive response from teachers and students to the PjBL method.

Amulla's research shows that there is a good attitude (active students and teachers) and avoids learning by the rote system if PjBL is used in learning and PjBL is recommended for learning in universities. In scientific writing, of course, the active attitude between educators and students will be seen. Both of them also no longer use rote strategies but are objective by the findings in the field.

Second, research conducted by Robinson, J. and Beneeroso [16] for a 3-year design at the University of Nottingham. Over the last few years, technical institutions around the world have implemented an alternative teaching model, namely the inductive mode of teaching (Graham, 2018, Prince and Felder, 2007 in Robinson, J and Beneeroso, D [16]. Furthermore, inductive teaching begins with real, authentic case studies, real world problems or real observations as an overarching motivation to generate the need for facts, theories, models and methodologies where students are introduced to the necessary information or are facilitated to learn it on their own. Based on the results of contextual research, it is more effective than the conventional approach. This approach is proven to increase learning activities and independence in interacting with other students and they are not completely dependent on the lecturer [20].

Students agreed that PBL that was carried out asynchronously could ease tasks that required reflection and that synchronous PBL activities (face-to-face meetings) were more effective in forming mindsets and building good social relationships. In order to build online PBL, researchers can propose various and continuous designs: (a) there is feedback on improvements;

(b) can facilitate finding a solution to a problem; (c) the existence of traces of work in learning is able to provide stimulation for social construction such as peer-feedback and knowledge of the real world.

Based on the research results of Robinson [16], PjBL strengthens independent character in learning, real, authentic studies. These characters are needed in the process of scientific writing. Scientific writing consists of tasks that require more reflection and thought. Thus, this second study confirms that the PjBL approach is suitable in scientific writing.

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Third, research was conducted by Chang, Ling-Chian, and Greg C. Lee. 6] PjBL is an effective method in an effort to increase students' motivation and interest in learning. In addition, PjBL also challenges teachers to learn how to implement it. Based on the experimental results, this learning method is suitable to be applied in certain educational environments. This method produces a new learning model that creates collaboration between one teacher and another

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Fourth, Blumenfield, et al [4] stated that the integrative perspective on motivation and learning has led to renewed interest in student projects. Upon examination, the implementation of the project by the teacher can have an impact on motivation and thinking, and explains how technology can be a supporting tool. In the process of working on the project, students and teachers alike have the opportunity to defend their opinions. Project-based learning is learning that has the main focus of student participation in the learning process. In this framework previously disclosed by Blumenfield, et al [4], students will ask questions to find solutions to non-trivial problems, express ideas, predict various possibilities, design experiments, collect and analyze data, draw conclusions, and combine all ideas and findings into a group. others, ask new questions, and create artifacts. There are two components of project-based learning: the formulation of a problem that will encourage students to do the activity; and these activities will produce products that can answer the question or problem formulation.

From Blumenfield's thinking, the stages of finding solutions, asking questions and improving, debating ideas, making predictions, designing plans and experiments, collecting and analyzing processes, conclusions, communicative are scientific writing processes.

Fifth, the effectiveness of PjBL is also expressed by A. Aranzabal, Epelde E., and Artexe, M., [2] Project-based learning (PjBL) was chosen as the core learning approach that can serve as a balance between course learning and assessment activities with learning. This project consists

of different synthesis steps. Table 1. shows the skills and tasks required in the team. Table 2. Learning outcomes, project achievements, and assessment schemes/weights. Table 3 shows a list of topics covered. Then, synchronization related to topics and formative evaluation results is carried out on the timeline of learning activities.

Projects have the opportunity to provide new and contextual insights into problem solving rather than merely gathering information. Researchers try to make students know, understand, decide, analyze and evaluate results, implement new insights into the world of work, can get activities challenging, and create a combination of social interaction and team collaboration in finding a way out of the complexity of the problem. Of the total, the existence of team activities in learning is proven to be 46% of learning in the classroom turned into team activities

Specific assessment tools including goal sheets, to-do lists, templates, grading rubrics, and feedback, as soon as milestones are completed, provide some guidance for building student thinking. Formative assessment is carried out when students undergo teaching and learning activities where learning is applied to an action that shows the achievement of student learning outcomes. The rubrics used by instructors to assess achievement reports are based on the achievement of learning outcomes and are public so students can self-assess the quality of their submissions before submitting them. Delivery of achievement reports includes sending several monitoring questionnaires (MQ) immediately after. MQ allows us to process individual knowledge on each outcome and to incorporate the appropriate score into each individual project score, by multiplying the team's overall project score by the Individual Accountability Factor (IAF).

Based on the fifth relevant research, the PjBL implementation process can be assisted by 3 tables: a table of skills and tasks, a checklist of achievement results, and a list of topics. Assessment tools in the process of filling out the table include goal sheets, task lists, templates, grading rubrics, and feedback.

In line with Sixth, Guo, et al. [9] also said that project-based learning (PjBL) is understood as an approach that can improve student learning in higher education. Empirical studies show that the focus of project-based learning lies in student outcomes. Affective outcomes (ie perceived benefits of PjBL and perceived PjBL experiences) were most widely applied, as measured by questionnaires, interviews, observations, and self-reflection journals. Cognitive outcomes (ie knowledge and cognitive strategies) and behavioral outcomes (ie skills and engagement) were measured by questionnaires, rubrics, tests, interviews, observations, self-reflection journals, artifacts, and log data. Artifact performance results are assessed with a rubric. Future research is expected to be able to examine further related to the student learning process and its final results [9]. They categorize the results into four categories, namely cognitive, affective, behavioral outcomes, and performance artifacts. Five categories of tools were revealed, including questionnaires, rubrics and taxonomies, interviews, tests, and self-reflection journals. Four tools (ie, self-reported questionnaire, tests, rubrics, and artifacts) were used to measure students' knowledge, of which self-reported questionnaires were primarily used. The form is a Likert scale and open-ended questions.

Cave et al. All [9], through the combined search service provided by the Leiden University Library, PjBL identified the learning processes of students involved in real projects and product development. Based on the content of the selected articles, Guo et al. prepared a matrix that

discusses the study design, learning outcomes, measurement tools, findings, and limitations of the studies reviewed. Based on this matrix, the measurements and the tools used to measure them are summarized according to the grouping of learning outcomes and commonly used research methods [9]. They divided the results into four categories, namely cognitive, affective, behavioral outcomes, and performance artifacts. Five categories of instruments were revealed, including questionnaires, rubrics and taxonomies, interviews, tests, and self-reflection journals. Four types of instruments (namely self-reported questionnaires, tests, rubrics, and artifacts) were adopted to measure students' knowledge, of which self-reported questionnaires were mostly applied. The form is a Likert scale and open-ended questions.The form is a Likert scale and open-ended questions.

Guo et al [9] conducted nine studies to measure the cognitive learning strategies used by PjBL students: 1) Wu, Hou, Hwang, and Liu (2013) students used seven strategies, including memory, comprehension, application, analysis, evaluation, create , and Off topic. 2) Stozhko, Bortnik, Mironova, Tchernysheva, and Podshivalova (2015) also use seven strategies, which are divided into four levels, namely low level (introduction), basic level (knowledge and understanding), intermediate level (application and analysis), and top level (application and assessment). 3) Oth Heo, Lim, and Kim (2010) and Hou, Chang, and Sung (2007) identified five stages of students' knowledge construction, namely information sharing, disagreement detection, meaning negotiation, modification of new ideas, and declaration of agreement. .4) In Helle, Tynjälä, Olkinuora, and Lonka (2007), two cognitive processing strategies of students were investigated, namely linking (ie relation of new knowledge to previous information) and structuring (ie outlines a set of ideas). tools (ie, rubrics/taxonomies, questionnaires, interviews, observations, and artifacts) were used to assess student learning strategies, with rubrics and taxonomies being the most commonly used.

The effectiveness of the results can be seen when the student is injecting about the things they are learning (i.e. is PjBL effective? how does he feel about the learning experience he is going through?). The three types of instruments used as a measure of this effectiveness are questionnaires, interviews, and observations. The questionnaire used in this case is an adopted questionnaire. Where this questionnaire is the type most often used in determining effectiveness. Brassler and Dettmers in Guo, et al., explain that students' problem-solving skills can be learned from three interdisciplinary perspectives; first apply and consider different views; second, reconsider the strategy used; and third, adopt and apply discipline-based methods. Then in determining effectiveness, there are a series of phases as a scenario-based problem-solving process starting from problem identification, data collection and analysis, and designing a backup plan of the observed data [9]. Based on relevant research, Guo explained that PjBL focuses the process on the effective results of the pouring in the process of conducting questionnaires, interviews, observations, and writing self-reflection. Cognitive results from effectiveness can be measured by questionnaires, tests, rubrics, observations, interviews, self-reflection writing, log data, and artifacts. Performance results in effectiveness can be measured and characterized by the presence of rubrics and artifacts.

The student learning process and various end products need further attention by researchers in the future. The research recommended by Guo [9] leads to a final product oriented to scientific writing.

Seventh, Fortune, Tracy, et all [8] explores the development of students at La Trobe University, Australia as global citizens, using a Student-as-Partners (SaP) approach in which partnerships focus outside the academic staff in politically and economically milieu. geographically, has been referred to as the "global south." They explore the experiences of Australian occupational therapy students partnering in project-based learning internships with public health leaders in India and Vietnam to advance healthcare needs. In contrast to their previous student experiences in Australia, students feel uncomfortable with the perception of others as "all-knowing." This adds to the challenge of being creative in a context with limited resources and perceived difficulties in applying an understanding of the global north. Despite the challenges, these students seem to have navigated an emerging cultural learning journey with new insights into their subjective worldviews and those of others. Findings suggest that these challenges can help students build confidence in doing and become practitioners who are agents, flexible, competent across cultures—and, in the long term, global citizens. The perspective of community partners in this study reaffirms that the program can help partners learn new ways of thinking and apply project learning in their organizations. The challenge for educators of the global north lies in how students are prepared to listen and enter into the subjective worldviews and realities of global south partners and ultimately to reflect on their worldviews.

This seventh relevant research proves that PjBL can build confidence and new ways of thinking. About scientific writing, confidence in the process of data collection and communication is needed. From the problems that arise, the new way of thinking emerges as a solution to the problem.

Eighth, the results of research by Lasauskiene, Jolanta, and Asta Rauduvaite [13] were conducted with an expert sample consisting of 9 lecturers who teach in music education study programs conducted at the Lithuanian University of Educational Sciences. All participants in this study were Master's degree holders and 7 of them were doctorates of Educational Sciences. The teaching experience of lecturers at universities varies: from 10 to 28 years. The results of the study stated that during the implementation of project-based learning (student competency development, collaboration between lecturers and students, professional development of lecturers) positive feelings experienced by lecturers, PjBL can create conditions for self-realization and professional improvement. The negative feelings experienced by lecturers, when project-based learning is applied (lack of student competence, lack of dialogue with students, lack of lecturer competence) do not carry out the planned role in student learning, encourage self-reflection and empowerment of lecturers in developing didactic and managerial competencies. Implementation of the project-based learning paradigm in the pedagogical study of music education, it is recommended to introduce solutions at the institutional level: developing a conception of PBL implementation as a strategy, designing a PBL implementation model and testing it, improving the professional competence of lecturers (changing attitudes into active learning methods, encouraging personal initiative lecturers, the collaboration between lecturers, equipping students with broader knowledge about project methods), study organization within an institution and study program.

Based on the eighth relevant research, it was found that several things became important notes when project-based learning was implemented not carrying out the planned role in learning (lack of student competence, lack of dialogue with students, lack of lecturer competence).

The ninth, research conducted by Lingkoh, Joyce Hwee, Susan C. Herring, and Khe FoonHew [14] the existence of an artifact design can solve a problem carried out by students in project-based learning. In previous project-based online learning, the focus of learning was on the dynamics of online collaboration; but the structure of student knowledge has not been observed globally. In this study, an analysis of the relationship between the level of students' knowledge structures during online discussions and face-to-face discussions in project-based activities will be carried out. The results of online activities carried out by postgraduate students on project-based and non-project-based learning will then be coded and measured on the structure of knowledge, teaching methods, and ways of interacting through online discourse analysis. The chi-square analysis found the consistency of the instructor's teaching discourse on project-based and non-project-based learning. Thus, there is an increase in the structure of knowledge in the form of rationality in ideas and the integration of coherent solutions. In contrast to potting activities, which are slower to move, this can be seen from online postings of students who do not explore ideas. Thus, online project-based learning needs to be studied. This research has an element of novelty from previous research, namely the existence of online PjBL.

The ninth research of PjBL with an online system is the most recent thing, if at the beginning it was mentioned the advantage is that PjBL can apply technology as communication. Thus in the process of scientific writing technology has an important role in searching for data and references.

Tenth, the online-based learning conducted by Kettanun at Bangkok University Thailand [12] states that there is effectiveness in project-based learning which is indicated by an increase in knowledge and social skills in students because they will be encouraged to participate actively in the presence of limitations from teacher supervision. . The success of project-based learning is due to the activeness of students in taking the initiative. The data shows that traditional ELF classes in Thailand are chosen by many students because they prefer to be given intensive guidance by the teacher. The research conducted will analyze the effectiveness of project-based learning that can be used in English classes. The researcher selected 21 third grade students at Bangkok University who received the 2013 Communication Arts Outstanding Student Program. Subjects were given a post test and a pre test to measure their level of English after participating in the program for 12 weeks. During the program, subjects will be interviewed and make reflection activities in a journal to then obtain data which can then be analyzed by researchers. The study then found findings in the form of effectiveness in project-based EFL classes as indicated by an increase in knowledge, attitudes, and interpersonal skills. Recommendations from further research to be able to contribute to the effectiveness of project-based learning in EFL classes from another cultural perspective.

The tenth relevant research proves that PjBL promotes intellectual and social abilities (cognition, work ethic, and interpersonal skills). In learning scientific writing, these two things play an important role.

As quoted from Krajcik and Blumenfeld in Baubaya and Alev Ateub, in this case educators can further emphasize the need for an inquiry process in the learning process to help build a view and theoretical foundation on project-based learning [3]. In the process of implementing project-based learning, an important finding from this study is the importance of an opportunity for students in the learning process which is also accompanied by conducting and experiencing a process and results carried out. The confidence instilled in them will make the learning process

better and can develop fun learning skills. In addition, the emphasis placed on them is also useful for developing certain personalities, for example critical thinking and skills, self-confidence, professionalism, team spirit, communication skills, and considerations that will later be experienced by the instructor as a natural material for the learning process and evaluation based on the learning process. On the other hand, students can also report that the activities carried out in this project-based learning can be carried out by collaborating. In conclusion, despite some limitations encountered in learning by students, in the consideration of the advantages as well as the positive results of project-based learning is the discovery of potential in the process of personality development obtained by students. Therefore, the learning of this project is useful in its application to a variety of disciplines for students ranging from different ages and improving classes.

The eleventh relevant research shows PjBL can develop research skills, confidence, professionalism, communication, team spirit. Research skills, confidence, professional, communicative support in scientific writing.

Sadeghi, et. All., posits that one of the various main problems students face in project learning is about how the improvement is obtained from students' writing skills [17]. The purpose of this study is to elaborate simply on the possible impact of project learning on paragraph writing skills. The study also conducted a pre-test of writing paragraphs as a comparison to measure their writing ability. Then, after 10 weeks of project defense, an assessment was carried out in the form of a post-test which aimed to write a new paragraph. The scores obtained are then analyzed through the use of a score comparison module and an assessment module developed by Soleimani et. All. The results presented on the t-test showed that students taught with PBL could outperform students who only learned conventionally based on student textbooks.

This finding lends credence to the positive effect of PBL in improving students' writing performance. It is clear that PBL is a possible means to improve language, content, and communication skills. They can use and combine language and factual knowledge in their real life while doing and creating projects. This is in contrast to traditional classrooms, where teachers transfer knowledge from textbooks to students. Therefore, it is very important to investigate PBL applied in the Iranian context, and to examine whether Iranian students are able to develop their English proficiency, study skills, and confidence through the use of PBL in their learning procedures. Sadeghi, Hossein, Morteza Biniaz, and Hassan Soleimani [17] define and explain PBL above in the study of SL and FL, then the definition of PBL in this study is summarized as deep learning, concentrating on real-world problems and challenges involving students who work as a team through meaningful activities that result in the final product.

Based on the twelfth relevant research, in relation to writing skills, PBL is a possible means to improve language, content, and communication, contextual, and product skills. The increase is assumed to occur in scientific writing skills.

Thirteenth, Kesera, Hafize and Dilek Karahoca [11] talk about project design. They designed the e-course material according to a project-based learning approach. First, the curriculum must be designed according to the stages of project-based learning. For each activity, you must start by determining the main objectives and sub-goals by defining the problem. An adaptive test generator can be used 1. Define goals; 2. determine the problem; 3. define the preferences of the results report; 4. define evaluation metrics and qualifications; 5. create and manage teams;

6. define subproblems and data collecting process; 7. define the work schedule; 8. define control points; 9. collect data; 10. data organization and reporting; 11. Present project results to evaluate and assess students' learning and cognitive abilities of situated forms.

Kesera, Hafize and Dilek Karahoca [11] emphasize the design of Project Management e-courses that may be suitable for engineering students. The most important point is to create the right group and carry out project-based learning activities. Creating and managing groups seems to be a very important factor for both project-based learning and project management activities. The survey results show that all activities have a significant correlation with each other. The following conclusions can be obtained for the project management e-course expectations from students who have experience in project-based learning stages: 1) Defining the project objectives and the title is the starting point for a project, 2) Determining the scope and scope of the problem, 3) Defining the report, 4) Define evaluation metrics to evaluate project stages and quality assurance, 5) Team creation and management process seem to be the most understandable phase for project management, 6) Define sub-problems based on work breakdown structure to get job details. 7) The importance of the work schedule is felt by students. 8) Determine the control points related to the 5th, 6th, and 7th factors.

Based on the above study, PjBL Planning can be adapted into scientific writing which includes 1) Defining project objectives and titles, 2) Determining the scope and scope of the problem, 3) Determining reports, 4) Determining evaluation metrics, 5) Team creation and management processes t, 6) Define subproblems. 7) The importance of a schedule. 8) Determine the control points related to the 5th, 6th, and 7th factors.
Based on the thirteen studies above, the results show that learning with PjBL conducted in schools and universities has a positive influence or impact. Through PjBL learning, students can gain real experience from the real world, solve problems, develop and create products, increase confidence in findings in projects, support communicative competence, intellectual development, social development, and other skills. In the project-based learning step, students are assisted with various cognitive, affective, and behavioral assessment tools.

4 Conclusions

PBL is deep learning, concentrating on real-world problems and challenges, engaging in meaningful group activities, and producing end products. Based on the thirteen relevant studies on PjBL, it is concluded that PjBL may be suitable for implementation in scientific writing learning because it has mutually supportive characteristics and attitudes. In PjBL there are the following attitudes related to scientific attitudes in scientific writing. 1) active attitude; 2) Reflective. 3) Collaborative and motivating. 4) finding solutions, asking questions and improving, debating ideas, making predictions, designing plans and experiments, collecting and analyzing processes, conclusions, communicative. 5) Three PjBL auxiliary tables: skill and task table, achievement checklist, and topic list. 6) Affective, cognitive, and performance outcomes, as well as products, can be measured. 7) Self-confidence. 8) carry out the role with responsibility. 9) PjBL with online technology system as communication. 10) Intellectual and social (cognition, work ethic, and interpersonal skills). 11) research skills, confidence, professionalism, communication, team spirit. 12) improve language, content, and communication, contextual, and product skills. 13) PjBL planning with several steps a) Defining project objectives and titles, b) Determining the scope and scope of the problem, c) Defining

reports, d) Determining evaluation metrics, e) Team creation and management, f) Defining sub-problems. g) The importance of the schedule. h) Determine the control points related to the 5th, 6th, and 7th factors.

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