

Effectiveness of Project-Based Learning (PjBL)

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Abstract—This research was aimed at investigating effectiveness of project-based learning toward students' achievement. Two groups of student majoring in accounting were involved in the research. The groups of students who had same English level of ability according to their English lecturer were given a three-session English learning with project-based learning (PjBL) approach. The experiment group was given PjBL model and the control group was given conventional learning model. Upon learning, students of both groups were assigned to make a dialog with members of their group. Their performance in front of class was assessed by using assessment rubric developed in prior. In addition, they were assigned to make written complaint. Assessment result of both group were then analyzed to see difference of both group competence, how much percent was the increase.

Keywords—students' comprehension, project-based learning, EFL, speaking, writing test

I. INTRODUCTION

Conventional teaching model, i.e. the one which has been implemented in Accounting Department Politeknik Negeri Bali (PNB), involves some activities, such as drilling, reading and comprehension, listening dialog through tape, writing, and grammar-test. These types of activity, although not entirely and frequently implemented, have been filling almost the entire learning of the English for Accounting. This research intended to measure if model of Project-Based Learning (PjBL) was visible toward the subject teaching.

Nguyen claimed, PjBL is an innovative learning approach [1]. Besides, it provides students with problem to solve and is carried out in in form of a project [2], [3], [4]. This model requires that students use their prior knowledge so that they can make concept on their own [5]. In its implementation, PjBL can be integrated with task which provides a concrete learning activity [6], [7]. The learning model is considered natural as it make use authentic materials and real life world [8], [9]. In addition, PjBL prioritizes learning experience as students are involved in executing project to reach goal [10]. The activities believed to be meaningful as it requires and involves students' creativity in entire learning activities, such as explore information [11], discussing, writing report, presenting result [12]. Apart from those, students are also invited to activate their communication skill [13], [14] as well as improving their learning skill autonomously [15].

There have been some studies on effectiveness of PjBL model to improve students' English competence. Those studies have been carried out in many parts of the world where learning English has been undertaken either as a second language or foreign language. Imtiaz and Asif [15] stated that PjBL was very effective to improve students' English competence in Pakistan. Involving research participants of university students of English, they found the model effective. Research of same purpose and participants was also undertaken in Thailand [16], in Iraq [17], and in Indonesia [18]. Apart from improving cognitive, such as speaking and writing English text, PjBL was also able to improve other supporting skills, such as enthusiasm, sense of confidence, creativity, ability to collaborate with senior high school students in Bali [19], emotional skill, learning ability, as well as students' comfort [20], students' autonomous learning and integrated curriculum development in Vietnam [21], [22], students' critical thinking [23], and improving students' vocabulary mastery [24]. Apart from these, research on PjBL was visible to contribute to concepts [25], development of students' skill [26], [27], [28], principles of PjBL execution [29], and effectiveness of PjBL to improve students' academic achievement [30].

There are some principles based on which PjBL underlies. One concept which strongly underlies this model is 'pragmatism', which applies knowledge in daily life practically. This model bridges knowledge with its context [31], [32], [33]. Other concept as its basis is 'constructivism' [35] that reflects knowledge in order for students to develop their own concepts. In addition, concept of 'action learning, action science, action research, and community of practice' [34] is also an integral basis to support PjBL. The concepts successfully realized learning goal of the model.

Previous research on PjBL undertaken by scholars claimed some advantages. First, it enabled learners to improve their English language skill, sense of self-confidence, critical thinking, as well as students' positive and analytical attitude [36], [37], [38], [39]. Other advantages were stated that PjBL empowered students' skill on doing research and investigation as well as made the learning more meaningful [40], [41] as they are reinforced to use the knowledge and skill in daily life. PjBL also allowed students chances to learn knowledge autonomously [42]; and working collaboratively to share their different perspective and reflected in a group work [43], [44]. As explained by the 'pragmatism' group in prior, PjBL could provide authentic

activities which connect knowledge with real life situation. This model was found effective and motivating as it implemented a 'progress-based' assessment method, a method which assess students' entire works so that they could completed and did endeavor in every single situation [7]. This model was also found very supportive to teachers' obsession to provide students with soft skill apart from hard skills, such as improving students' learning motivation, increasing willingness and decreasing stress, and attracts students to learn harder [45], [46]; and fasten their 'learning to learn' [47].

A part from those advantages, negative sights seemed to be abundant claimed to this model. Becket [48] observed students' tendency to avoid learning topics. Learning should be focused on the language as it is a language class. As former learning used to be undertaken formally where students had to work individually, PjBL concept of group work was demanding for them [49]. In addition, learning language formally in class which was based on curriculum was intended to introduce many a lot topics or language forms that one unit of lesson was learned in a single session, learning a topic in relatively bigger number of session or longer hours made students bored. Students did not get used to study in class where teachers functioned as a facilitator or coordinator only better than as a teacher [20]. Toward the weakness of PjBL, some research were carried out by scholars and finally proposed a solution to it. Backet and Slatar [50] recommended that the learning shall be realized to be an explicit English language acquisition. Students should be introduced to language learning more than knowledge or topic learning. Students' progress should be frequently observed by using check list or questionnaire [51], thus students should be given assessment rubric to be discussed with teachers prior or during the learning [41]. Moreover, pre-teaching has to be given to improve their English ability prior to doing project [52]. Thus, in order to make PjBL more effective, some factors and principles shall be given attention prior its implementation, such as 'centrality, driving question, constructive investigation, autonomy, and realism' [2]. Other recommendation to achieve its effectiveness was on curriculum adjustment, project duration realization, skill collaboration, context and real world connection, and assessment and class management [1]. Students should also be introduced with some strategies in prior, such as 'decision-making, critical reflection, independent action, multiple skills, process-oriented, problem solving, self-reflection, and collaboration with environment' [36], [50], [42].

The advantages and disadvantages claimed were like a pendulum swing, they were inspiring and attractive to be observed further. Thus, different perspectives should be utilized to find other possibilities of PjBL. The indecisive opinion triggered that this replication research was undertaken. This research was done for a specific purpose that was to recognize factors that could trigger students' comprehension of the project topic.

II. METHOD

The qualitative study tried to investigate effectiveness of PjBL. Two groups of semester-six-student majoring in

Accounting were involved as research participant. Each group contained twenty nine students who had same level of English ability based on their English lecturer. The participants were divided into two groups, one experiment group and one control group. Both groups were given a three-session English learning discussing topic of 'making complaint'. The experiment group was given PjBL approach and the control group was given English learning with conventional method.

PjBL was used on the basis of pragmatism factor, constructivism, and action learning, action science, action research, and community of practice'. These factors were driving students to learn, particularly 'decision-making, critical reflection, independent action, multiple skills, process-oriented, problem solving, self-reflection and critical thinking with group work, collaborative, autonomous learning. There were five stages done in English learning with PjBL model, such as preparation, realization, presentation, and evaluation [23]. In 'preparation' stage, students were invited to select theme, to determine education goal, to select final product, to create general structure of project, to manage a plan, to form team, and to produce final written logical framework. Stage of 'realization' as the second step included gathering information, processing and analyzing information gathered, as well as determining language demand for final activity. Stage of 'presentation' was focusing on how presentation was managed. In this case, students presented their groups' final project result. And the last step was 'evaluation'. In this case, instructor evaluated all groups' oral presentation and written project result. Apart from using performance test, students' work and activities were observed from the beginning until the end of project in form of portfolio. As there were three sessions of the whole learning, preparation was discussed in the first session or meeting, realization stage was done in second session or meeting, presentation phase and evaluation were done in third meeting. As performance test assessed students' English performance, assessment tool used was that which contains two main aspects, accuracy and 'fluency'. Fluency covered three aspect, such as 'fluency', 'pronunciation', and 'comprehension', while 'accuracy' covers 'grammar' and 'complexity' [53]. The assessment tools were used to score students' presentation. In this test, each student was given five aspects of score, they were fluency, pronunciation, comprehension, grammar and complexity. Writing test was also given to participant upon the project realization. The test required them to make written complaint to any company on their own. Students were asked to write how they make appropriate written complaint. Result of both tests were then analyzed. Both test result (result of control and experiment group) were compared and analyzed qualitatively. Result of analysis were mostly reported with formal method in form of narration, even though they were tables used to support the information.

III. RESULT AND DISCUSSION

Test results of both groups are showed beneath. It is clearly drawn that control group's total score was 270. Their each aspect score ranged from 49 to 60. Of the five aspects, fluency with score 60 and comprehension with score 59 were considered to be their best skills. And aspect of pronunciation was their second best skill with score 52. Their

score of fluency aspect was 57. In terms of accuracy, their competence on grammar and complexity were similar with score of 49 and 50. Their average score of each sub-aspects of fluency, pronunciation, and comprehension were 2.0, 1.7, and 2.0 respectively, and their average score of sub-aspects of grammar and complexity were 1.6 and 1.7 respectively. And their average score of accuracy aspect was 49.5. This condition indicated that control group member were competent at 'fluency' better than 'accuracy' as shown in Table I.

TABLE I. CONTROL GROUP SCORES

Fluency			Accuracy		Total
Fl	Pron	Comp	Gram	Compl	
60	52	59	49	50	270
2.0	1.7	2.0	1.6	1.7	9.3
	57			49.5	

Fl: fluency; Pron: pronunciation; Comp: comprehension; Gram: Grammar; Compl: complexity.

Experiment group competence was a bit higher than that of control group. It can be seen from total score and average score of both groups. Total score and average score of control group were 270 and 9.3 respectively. And total score and average score of experiment group were 356 and 11.9 respectively. The average increase in score of control group and experiment group was 28.24%. This increase was not considered very sharp.

It can be observed obviously that experiment group members were a lot better at aspect of fluency than their aspect of accuracy. Their scores of sub-aspects of fluency, pronunciation, and comprehension were 80, 75, and 80 respectively. And their score of sub-aspects of grammar and complexity were 59 and 62 respectively. Of the three sub-aspects of fluency, their fluency and comprehension competence were higher than their pronunciation competence (80, 75, and 80). In term of accuracy aspect, they were a bit more competent at grammar than at complexity (59 and 62). Their average scores of sub-aspects of fluency, pronunciation, and comprehension were 2.6, 2.5 and 2.7 respectively. Their average scores of accuracy, including grammar and complexity were 20 and 19 respectively, as shown in Table II.

TABLE II. EXPERIMENT GROUP SCORES

Fluency			Accuracy		Total
Fl	Pron	Comp	Gram	Compl	
80	75	80	59	62	356
2.6	2.5	2.7	2.0	1.9	11.9
	78.3			60.5	

Fl: fluency; Pron: pronunciation; Comp: comprehension; Gram: Grammar; Compl: complexity.

Experiment students' fluency competence was a lot higher than that of control group student. The experiment students' competence were 37.36% and 22.22% higher than control students' competence. Their competence on fluency aspect was still better than their accuracy. It means, students of both groups were able to produce utterances easily. They were able to produce utterance and comprehend direction more easily but they were less able to pronounce words or sentences totally correct. In term of fluency aspect, they found it harder to pronounce words correctly better than

speak fluently and understand direction. However, accuracy particularly grammar was found harder than complexity. It means that they were able to produce both simple and complex sentences or utterances but still frequently failed to use correct or appropriate grammar.

Comparison between experiment and control group showed that there was a slight increase in score of the experiment group. The slight increase in score between control group and experiment group might resulted in some factors, such as 'length of study', 'short preparation toward realization', and 'students' difficulty in searching knowledge' and 'unfamiliarity with procedure'. Relatively short study duration on PjBL might be one of reasons why such grade of effectiveness of the model occurred. The three-session lesson was insufficient for students to work out the model to achieve better result. According to participants, the learning model introduced a new learning procedures which is not familiar for students. Students seemed to lack of time to get used to the procedure while learning language. There should be more than one topics discussed for some learning cycles. Longer study experience or more topics tried in more learning cycles will make students familiar with the way how PjBL work. Consequently, it will bring about better understanding of the model and better learning output. The learning should prioritize students' learning experience [10].

The learning sessions allocated insufficient preparation for realizing the result. The case was not on how hard the model of learning was, but on how insufficient preparation for learning was undertaken. The learning lacked of preparation in order for students to be able to realize learning goal. Preparation can be given in the form of pre-teaching activity [53]. Pre-teaching activity can be realized with giving an orientation on PjBL, such as principle of PjBL, concepts of centrality, driving question, constructive investigation, autonomy, and realism' [2]. Preparation can also be focused on preparing students' language skill prior to their project as they will need it during undertaking searching, discussion, presenting topic. The less optimal achievement was assumed to be the result of students' difficulty in searching knowledge and their unfamiliarity with PjBL procedure.

IV. CONCLUSION AND RECOMMENDATION

PjBL is a partly effective learning model. This is caused by condition where learning was tried in a relatively short time. Thus, students did not have chance to comprehend concept of the model. The learning cycles should be made longer or in more number of meeting. In addition, more topic should be introduced and discussed so that they experience more [10]. Moreover, pre-activity is potential to be introduced to students. They have to be introduced concept of the model. Important learning strategy should also be delivered to them, such as how to investigate materials or information as content, to give preparation, like language training, vocabulary enrichment and others [53]. Preparing students with strategy and skill will make their learning meaningful by optimizing their involvement in the learning.

Implementation of PjBL should be appropriately carried out. To do so, one of endeavors is by introducing concept of the model more deeply to students so that they really

comprehend the model. This can be achieved through giving students pre-teaching, such as introducing concept of the model, introducing language used to execute the project, procedures of undertaking project. This effort certainly needs extra times. Thus, there should be longer learning times or more learning cycles given to students so that they could make better understanding on the model. This will enable students to energize better and achieve better goal. Toward this study, a replication study by involving different number of research participants, learning duration, and number of topics discussed.

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REFERENCES

- [1] N. T. V. Lam, "Project-based learning as a foreign language," *VNU Journal of Sciences*, vol. 27, pp. 140-146, 2011.
- [2] J. W. Thomas and J. R. Mergendoller, "Managing project-based learning: principles from the field," Paper presented at the annual meeting of the American Education Research Association, New Orleans, 2000.
- [3] J. Larmer, T. Markham, and J. Ravitz, *Project-Based Learning Handbook*. Oakland, 2003.
- [4] S. Bell, "Project-based learning for 21st century: skill for the future," *The Clearing House*, vol. 83, no. 2, pp. 39-43, 2010.
- [5] M. A. Weegar and D. Pacis, *A comparison of two theory of learning-behaviorism and constructivism as applied to face-to-face and online learning*. Manila, 2012.
- [6] D. A. Kolb, *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, NJ: Prentice-Hall, 1984.
- [7] S. Kriwas, *Pedagogical Science. Basic Theme*, Athens: Gutenberg, 2007.
- [8] B. Smith and R. Doods, *Developing Managers through Project-Based Learning*. Aldershot / Vermont: Gower, 1997.
- [9] U. Ndon, "Hybrid-context instructional model: the internet and the classrooms: the way teachers experience it," 28th Annual Conference on Distance Teaching and Learning, 2011.
- [10] D. Kotti, "Experiential learning form theory to practice," *Adult Education*, vol. 13, pp. 35-41, 2008.
- [11] J. Mezirow, *Transformative Dimensions of Adult Learning*. San Francisco: Jossey-Bass, 1991.
- [12] Z. Z. Guven, "Project-based learning: a constructive way toward learner autonomy," *International Journal of Languages' Education and Teaching*, 2014.
- [13] P. C. Blumenfeld, E. Soloway, R. W. Marx, J. S. Krajcik, M. Guzdial and A. Palincsa, "Motivating project-based learning: Sustaining the doing, supporting the learning," *Educational Psychologist*, vol. 26, no. 3, pp. 369-398, 1991.
- [14] Y. Harun, *Project-based Learning Handbook: Educating The Millennial Learners*, Kuala Lumpur: Educational Technology Division Ministry of Education, 2006.
- [15] S. Intiaz and S. Asif, "I almost learnt to learn: Promoting learner's autonomy through project based learning in access classrooms," *Language in India*, vol. 12, no. 1, pp. 24-45, 2012.
- [16] W. Ruenglertpanyakul, "Attitude about project-based learning and lecture based for develop communication skill," *European Journal of Social Sciences*, vol. 28, no. 4, pp. 465-472, 2012.
- [17] S. Nassir, *The Effectiveness of Project-based Learning strategy on Ninth Graders' Achievement Level and Their Attitude Towards English in Governmental Schools*. North Governorate (Master Thesis), Gaza: The Islamic University, 2014.
- [18] P. Rochmahwati, "Project-based learning to raise students' speaking ability: its effect and implementation (a mix method research in speaking II subject at STAIN Ponorogo)," *Kodifikasia*, vol. 9, no. 1, pp. 199-222, 2016.
- [19] N. L. P. N. S. Astawa, L. P. Artini, and P. K. Nitiasih, "Project-based learning activities and EFL students' productive skills in English," *Journal of Language Teaching and Research*, vol. 8, no. 6, pp. 114-1155, 2017.
- [20] I. Fragoulis, "Project-based learning in the teaching of English as a foreign language in Greek Primary School: From theory to practice," *English Language Teaching*, 2009.
- [21] T. Mc.Carthy, *Integrating Project-based Learning into A Traditional Skill-based Curriculum to Foster Learner Autonomy: Action Research*. 2010.
- [22] N. T. V. Lam, "Project-based learning in teaching English as a foreign language," *VNU Journal of Science, Foreign Languages*, vol. 27, pp. 140-146, 2011.
- [23] B. Allan and F. Stoler, "Maximizing the benefits of project work in foreign language classrooms," *English Teaching Forum*, vol. 43, no. 4, 2005.
- [24] A. Shafaei and H. A. Rahim, "Does project-based learning enhance Iranian EFL learners' vocabulary and retention?," *Iranian Journal of Language Teaching Research*, vol. 3, no. 2, pp.83-99, 2015.
- [25] P. N. Foss, K. McDonald and M. Rooks, "Project-based learning activities for short term," *Asian EFL Journal*, 2005.
- [26] K. Poonpon, "Enhancing English skills through project-based learning," *The English Lecture*, vol. XL, pp. 1-10, 2011.
- [27] I. Miftari, "Project based learning: Developing 21st Century collaborative and technology skills," *European Journal of Research on Education*, pp. 52-57, 2014.
- [28] N. B. Nguyen, *Promoting Students' Activeness and Self-directedness in the Teaching and Learning Process. A Course Book for Further training of high School Teacher-1993-1996 period*, 1996.
- [29] B. J. S. Barron, "Doing with understanding: lesson from research on problem and project-based learning," *The Journal of the Learning Sciences*, vol. 7, no.3, pp. 271-311, 2015.
- [30] P. Horpyniuk, "How effective is using project-based learning with junior high students to achieve improvement in their academic results and schooling experience," *Master Thesis, University of Victoria*, 2015.
- [31] K. Frey, "The project method", *Thessaloniki Kyriakidis*, 1986.
- [32] J. Dewey, *Experience and Education*. New York: MacMilan, 1938.
- [33] W. H. Kilpatrick, "The project Method," *Teacher College Record*, vol. 19, 1918.
- [34] R. J. DeFillippi, "Introduction: project-based learning, reflective, practice, and learning outcomes," *Management Learning, SAGE social science collection*, 2001.
- [35] J. Weld and L. Funk, "I'm not the science type: effect of an inquiry biology content course on pre-service elementary teachers' intentions about teaching science," *Journal of Science Teacher Education*, vol. 16, no. 3, pp. 189-204, 2005.
- [36] F. Stoller, "Establishing a theoretical foundation for project-based learning in second and foreign language contexts," *Greenwich: Information Age Publishing*, 2006.
- [37] D. L. Fried-Booth, *Project Work*. New York: Oxford University Press, 2002.
- [38] L. Q. Allen, "Implementing a culture portfolio within a constructivist paradigm," *Foreign Language Annals*, vol. 37, pp. 232-239, 2004.
- [39] G. S. Levine, "Global simulation: a student-centered, task-based format for intermediate foreign language courses," *Foreign Language Annals*, vol. 37, pp. 26-36, 2004.
- [40] M. W. Colombo, "English language literacy: motivating culturally diverse students to improve reading and writing skills," *New English Reading Association Journal*, vol. 38, no. 3, pp. 10-14, 2002.
- [41] N. R. Tims, *Project-based Learning (PBL) in Adult English As A Second Language (ESL) Programs. Students' Perspectives*, ProQuest Dissertations Publishing (3391961), 2009.

- [42] P. Skehan, *A Cognitive Approach to Language Learning*, Oxford: Oxford University Press, 1998.
- [43] J. A. Coleman, "Project-based learning, transferable skills, information technology and video," *Language Learning Journal*, vol. 5, pp. 35-37, 1992.
- [44] T. C. Reeves, J. Herrington and R. Oliver, "Authentic activity and online learning," vol. 25, pp. 562-567, 2002.
- [45] Z. Dornyei, *Motivational Strategies in The Language Classroom*. Cambridge: Cambridge University Press, 2001.
- [46] I. Lee, "Project work made easy in the English classroom," *Canadian Modern Language Review*, vol. 59, pp. 282-290, 2002.
- [47] A. L. Brown, D. Ash, M. Rutherford, K. Nakagawa, A. Gordon and J. C. Campione, *Distributed expertise in the classroom*. Cambridge: Cambridge University Press, 1993.
- [48] G. H. Beckett, *Project-based second and foreign language education: Theory, research, and practice*, Greenwich: Information Age Publishing, 2006.
- [49] C. Petersen and H. Nassaji, "Project-based learning through the eyes of teachers and Students in adult ESL classroom," *Canadian Modern Language Review*, vol. 72, no. 1, pp. 13-39, 2016.
- [50] G. H. Beckett and T. Slater, "The project framework: A tool for language, content, and skill integration," *English Language Teaching Journal*, vol. 59, no. 2, pp. 108-116, 2005.
- [51] D. Doherty and J. Erying, *Instructor experiences with project work in the adult ESL classroom: A case study*. 2006.
- [52] D. Moss and C. Van Duzer, *Project-based Learning for Adult English Language Learners*. ERIC Digest, 1998.
- [53] P. Somawati, N. Kanca, and I. M. R. J. Widanta, *Pengembangan Model Pembelajaran Bahasa Inggris Berbasis Task di Jurusan Pariwisata Politeknik Negeri Bali, Laporan Penelitian DRPM*, 2018.