

# Retooling Practice Learning Model Based on Project Based Learning Integrated to Tamansiswa Studies at University

Dianna Ratnawati, Samsul Hadi, Setuju Setuju, Bayu Rahmat Setiyadi, Sigit Purnomo, Nurcholis Arifin Handoyo

**ABSTRACT**--- *The purpose of this research: (1) producing a new learning method based on project based learning integrated to Tamansiswa studies; and (2) testing the effectiveness of the method. This type of research is Research and Development. The results of the expert validation showed an average level of feasibility of the method 84% which meant it was very feasible. The character value of students in the control class, which was originally 41.44 in the sufficient category, increased to 47.83 in the high category in the small class trial with 24 students. While the results of trials in large classes on 95 students obtained the results of student character values increased to 49.23 in the high category. The significance value of 0.000 is less than 0.05 shows that there is a positive relationship between project based learning integrated to Tamansiswa studies method to the character of students with an effectiveness level of 18.2%.*

**Keywords**—Character, Project Based Learning, Tamansiswa.

## I. INTRODUCTION

Facing the tight competition of the 21st century, the quality of human resources needs to be improved to be able to survive and compete in the international arena. 21st century competency needs include 4C, namely communication, collaboration, critical thinking, and creativity [1]. If examined further, the competency is closely related to character. Ratnawati asserted [2] holistic character education had a positive impact of 19.1% on soft skills. While soft skills are the key to success in a career. This success is an indicator of human resources which can compete both nationally and internationally.

In Indonesia, character education is relevant to national education goals and continues to be developed by the Ministry of Education and Culture by staging a strengthening of character education in stages since 2016. There are five main values of character that are interrelated to form a value network that needs to be developed as a priority for strengthening the nation's main characters, namely (1) religious; (2) nationalist; (3) independent; (4) mutual cooperation; and (5) integrity. Furthermore, the

Ministry of Education and Culture emphasizes one of the character strengthening strategies, namely through the application of project-based learning methods.

The learning steps in the project based learning method [3] consist of: (1) starting with the big question; (2) designing a plan for the project; (3) creating a schedule; (4) monitoring the students and the progress of the project; (5) assessing the outcome; and (6) evaluating the experience. This method is recognized by educators as 21st century learning methods for students. In the study findings by [4] it is stated the project based learning model can improve affective skills from cycle 1 to cycle 2, namely 9.41 and psychomotoric students increase 6.6 from cycle 1 to cycle 2. Affective skills are part of the character, thus the project based learning model is suitable for improving the character of students.

Character education has been explicitly stated by Ki Hadjar Dewantara decades ago through his thought that emphasizes that education is an effort to promote the growth of character (sports, thought, processing, and heart processing), where this thought is used as a vehicle, pathways, and a medium for strengthening national character education from the structure of activities in the current education system [5]. There are still many thoughts from Ki Hadjar Dewantara that need to be implemented related to the teaching of character settling in line with the Pancasila and the 1945 Constitution, in which the thoughts are concretely extracted in student teaching. In the teachings there are Trilogy of Tamansiswa, philosophy, Pancadarma and principles of Tamansiswa.

In this study, the teachings that will be integrated in the learning process focus on three sub-values, namely the principle of Tamansiswa, Pancadarma, and Trilogy of Tamansiswa. The principles of Tamansiswa include (1) principles of human rights, (2) independence, (3) civilization, (4) equality, (5) independence, (6) simplicity and makarya, (7) devotion and purity of heart. While Pancadarma consists of 5 joints: (1) natural destiny, (2) freedom, (3) culture bases, (4) nationality, and (5) humanity. And the Trilogy of Tamansiswa consists of: (1) tringa, (2) three centers of education, (3) trihayu, (4) three con-theory, (5) Trilogy values of leadership, (6) three abstinence, and

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three-N (niteni/identification, nirokake/imitation, nambahi/elaboration). Thus, through this study a new learning model was developed through the project based learning method based on student teaching to strengthen the character value of students.

## II. METHOD RESEARCH

This study uses the research and development method. The product produced in the form of innovative project based learning methods oriented to student teaching has been tested for effectiveness. The development design is aligned with the ADDIE [6] model with 5 stages, namely (1) analysis; (2) design; (3) develop; (4) implement; (5) evaluate.

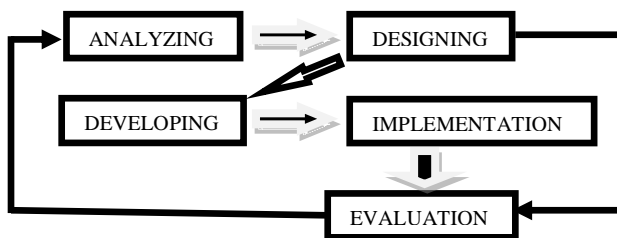


Fig. 1. Design of ADDIE Development

The study sample consisted of 151 students of mechanical engineering education at the Universitas Sarjanawiyata Tamansiswa students who were spread in 5 classes. The sampling technique uses purposive sampling. One class (32 students) was chosen as the control class. While the class with 24 students was used for small class trials and 3 classes with a total of 95 students used for large class trials. The instruments used included questionnaires to assess students' perceptions of the implementation of project based learning methods based on student learning and character assessment questionnaires filled by students as well as an assessment sheet for the feasibility of methods for instructional strategists, material experts, and experts on student participation. The products produced are in the form of practice indicators of dial indicator measurement in the oral form uploaded in Edmodo and written reports.

Data analysis techniques use mixed methods with quantitative dominance. The level of effectiveness of the method was analyzed by comparing the level of assessment of student character in the control class with small and large classes and seeing the level of effectiveness of the sig value level of the analysis with SPSS 20.00.

## III. RESULT AND DISCUSSION

### *Learning Model of Project Based Learning Oriented by Tamansiswa Studies*

The learning model of project based learning oriented to student teaching results of the development of this research includes six stages as follows:

The first stage, open the lesson with challenging questions accompanied by strengthening the principle of equality, Pancadarma (humanity), three-N (niteni/identification, nirokake/imitation, nambahi/elaboration) with steps: (a) the lecturer opens learning by praying together; (b) lecturers display tutorial videos of vocational high school students using an indicator dial to measure disc discs accurately and

accurately; (c) the lecturer challenges students "can students exceed the student's skills in video and can achieve the standard of competency in using indicator dial indicators in accordance with standard operating procedures and accurate results"?; (d) the lecturer gives a motivational picture of the importance of measurement skills using a dial gauge in the automotive industry.

The second stage, planning the project with the strengthening of the principles of equality and independence, Pancadarma (freedom), Trilogy (nambahi/elaboration, ngerti/understand, ngrasa/feeling and leadership) with steps: (a) the lecturer divides the group fairly / heterogeneously; (b) the lecturer instructs the project produced by each student in the form of an indicator report on the measurement of dial indicators in audio and visual versions. Where practice reports are made based on procedures and measurement results that are packaged in a measurement tutorial recording using dial indicator tools and recorded practice reports; (c) the lecturer gives freedom to students in choosing objects in the chassis system. At the end of learning, students must complete the report project independently and honestly; (d) the lecturer provides a practical report book for students and shows the report format but can be developed by students related to its filling; (e) lecturers foster students' sense of creativity in planning reports.

The third stage, arranging activity schedules accompanied by strengthening the principles of independence, Trilogy (ngerti/understand, ngrasa/feeling, nambahi/elaboration and leadership) with steps: (a) the lecturer explains the lesson plan for the semester, especially at the learning meeting material using dial indicator tools and distributing the semester lesson plan printouts; (b) the lecturer accommodates complaints from students regarding the constraints of planning reports and providing alternative solutions; (c) the lecturer gives motivation for optimism, and an alternative management time in the execution of tasks.

The fourth stage, overseeing the course of the project accompanied by strengthening the principles of equality and independence, Pancadarma (freedom, nationality, and humanity), Trilogy (nambahi/elaboration, and leadership) with steps: (a) lecturer facilitates means of measuring and measuring objects with good quality and according to the number of groups; (b) the lecturer provides a digital reference book on technical measurement that can be accessed by students from the lecturers' personal blogs; (c) lecturers monitor learning activities in the classroom, starting with students reviewing various references, measurement practices, and preparing audio and visual practice reports; (d) lecturers give freedom to students to learn from each other from group members or between groups; (e) the lecturer ensures that student report products are the result of individual student creativity; (f) lecturers guide the course of the learning process with patience and fairness.

The fifth stage, an assessment of the products produced with the strengthening of the principles of equality,

Pancadarma (nationality and humanity), Trilogy (leadership) with steps: (a) the lecturer instructs students to comment on the recorded entries in edmodo; (b) the assessment of reports based on peer arguments and the results of the appraisal of the books recorded; (c) the lecturer as a facilitator walks the discussion and presents the results of the product evaluation in a random, open and objective manner; (d) lecturers provide rewards for creative and outstanding students in the form of additional grades and give praise to motivate students to continue to achieve and learn throughout life; (e) lecturers provide punishment in the form of value reduction if there are similarities in the results of student reports; (f) lecturers provide motivation for students to excel and continue to develop character values in themselves to build the country and be able to compete positively.

The sixth stage, evaluation which is accompanied by strengthening the principles of equality, Pancadarma (freedom and humanity), Trilogy (nambahi/elaboration and leadership) with steps: (a) the lecturer evaluates the student learning process to be improved in the stage of project preparation for the next meeting and justifies / strengthens measurement procedure, calculation and how to read the indicator dial indicator; (b) the lecturer presents the results of the evaluation openly and straightforwardly; (c) the lecturer receives criticism and suggestions from students as a reflection material for improving the learning activities of the next meeting; (d) the lecturer distributes student perception questionnaires on the application of a project based learning model that integrates student teaching and student character questionnaires honestly.

*Effectiveness of Learning Methods Project Based Learning Oriented by Tamansiswa Studies*

The feasibility level of the model from the results of the assessment of the learning strategist, the expert of material measurement techniques and the expert of the students was obtained the percentage of 83% feasibility with a very feasible category.

$$PK = (\sum N_1 + \sum N_2 + \sum N_3) / 120 \times 100\% \quad (1)$$

$$= (32 + 35 + 32) / 120 \times 100\%$$

$$= 83\%$$

Equation (1) is used to calculate the feasibility percentage of project based learning model oriented to student teaching based on expert judgment, where PK is the percentage of feasibility;  $\sum N_1$  is the total value of a strategist;  $\sum N_2$  is the total value of the material expert;  $\sum N_3$  is the total value of the expert of participation and 120 is the total score expected from experts. With a total feasibility percentage of 83%, the model is very feasible to be applied in classroom learning.

Furthermore, the results of the model trials in small and large classes obtained changes in the quality of the character of students from the original quality characters in the control class with a mean of 41.44 with sufficient categories increased to 47.83 in the high category in small class trials. While the quality of the characters from the results of the 49.23 large class trial is very good. The complete data can be seen in the table below.

**Table 1: Statistics Character In Control Class**

N	Valid	32
	Missing	0
	Mean	41.44
	Median	43.50
	Mode	45
	Std. Deviation	7.134
	Minimum	30
	Maximum	53

**Table 2: Distribution of Frequency Value of Character In Control Class**

No.	Interval	Category	Frequency	Percentage (%)
1.	48 - 53	Very high	7	22%
2.	42 - 47	High	11	34%
3.	36 - 41	Enough	5	16%
4.	30 - 35	Less	9	28%
<b>Total</b>			32	100%

With the acquisition of mean 41.44 in the control class, it can be concluded that the initial character quality of mechanical engineering students is in the sufficient category.

**Table 3: Statistics Character in a Small Class**

N	Valid	24
	Missing	0
	Mean	47.83
	Median	49.00
	Mode	52
	Std. Deviation	5.172
	Minimum	36
	Maximum	55

**Table 4: Distribution of Frequency Value of Characters in Small Class**

No.	Interval	Categor y	Frequen cy	Percentage(%)
1.	51 - 55	Very high	9	37%
2.	46 - 50	High	8	33%
3.	41 - 45	High	4	17%
4.	36 - 40	Enough Less	3	13%
<b>Total</b>			24	100%

With the acquisition of mean 47.83 in the trial model in the small class, it can be concluded that the quality of the students' character in the high category.

**Table 5: Statistics character in the big class**

N	Valid	95
	Missing	0
	Mean	49.23
	Median	49.00
	Mode	44

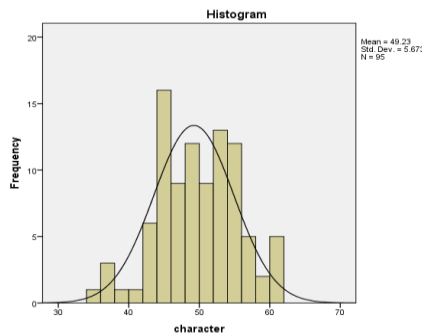




Std. Deviation	5.673
Minimum	35
Maximum	60

**Tabel 6: Distribution of Tabel 6: Frequency Value of Characters in Big Class**

No.	Interval	Category	Frequency	Percentage (%)
1.	54 - 60	Very high	24	25%
2.	48 - 53	High	34	36%
3.	42 - 47	Enough	31	33%
4.	35 - 41	Less	6	6%
<b>Total</b>			95	100%



**Fig. 2. Histogram Of Large Class Character Quality**

With the mean acquisition of 49.23 in the trial model in large classes it can be concluded that the quality of the character of mechanical engineering education students is in the high category.

**Tabel 7: Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients <i>Beta</i>	t	Sig.
	<i>B</i>	Std. Error			
1 (Constant)	22.882	5.818		3.933	0.000
PBL	0.550	0.121	0.427	4.548	0.000

<sup>a</sup> Dependent Variable: Character

From table VII it can be identified that the probability value sig 0,000 < 0.05 significance level. Thus it can be concluded that there is a relationship between the project based learning model and the character of the students of mechanical engineering education.

**Tabel 8: Model summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.427 <sup>a</sup>	0.182	0.173	5.158

<sup>a</sup> Predictors: (Constant), PBL

<sup>b</sup> Dependent Variable: Character

The magnitude of the relationship between project-based learning models oriented to student learning with student character can be seen from the coefficient of determination (Rsquare) of 0.182 or 18.2%. Thus it can be concluded that the level of effectiveness of the application of project based learning models oriented to student teaching is 18.2%.

### Discussion

The key to success in building the character of students in school is the teacher. So the teacher must understand in applying learning methods that can build students' character. Wardani [7] in his research findings concluded that project based learning can shape students' character. Furthermore, in the student's teaching that implements the noble values of Ki Hajar Dewantara's thought; it is effective to strengthen the character of students through character education applied in schools rather than conventional learning [8]. With the development of project-based learning models oriented to student teaching, it can certainly strengthen the value of student character. This is relevant to the results of this study where the results of the development of a project-based leaning model that is oriented towards students' learning show an effectiveness level of 18.2% in shaping the character of students of mechanical engineering education, especially religious character, independence, mutual cooperation, nationalism, mutual cooperation and integrity.

Ki Hadjar Dewantara revealed in the teachings of KeTamansiswa (Trilogy values of leadership) namely ing ngarsa sung tuladha which means that a teacher must be able to provide exemplary and exemplary actions[9], then exemplary actions can be actualized as examples of behaviors that reflect the character of learning activities in class like religious, nationalist, independence and integrity. In each steps the application of project based learning models oriented to student learning is reinforced by the principle of Tamansiswa, Pancadarma and Trilogy of Tamansiswa.

Pancadarma freedom applied by lecturers to students in working on projects in the form of practice reports is an effort to form independent characters. The meaning of freedom means to be free and free, so we must work according to our own strength, freedom of mind, freedom of mind, and freedom of energy. Even though we do not refuse help from others, but if the help will reduce our freedom of birth or the mind must be rejected. This is a tangible manifestation of the character of independence [10]. This shows that Ki Hadjar Dewantara's teachings prioritize self-reliance on students, with which students will have an independent character.

Furthermore, electronic media contributes with the index 0.63 of students' religious character [11]. In the implementation phase of the model, namely the supervision of the project, it is designed to strengthen the principle of independence; the lecturer uses digital measurement techniques to facilitate understanding of measurement procedures which can improve student achievement. Thus the principle of independence can increase students' sense of nationalism as indicated by achievement. Besides, online media used by lecturers is e-learning learning to upload audio report project results. Through the activities of the report in the form of recordings, it encourages students to help each other both by taking turns holding cellphones to record and learn from each other to exchange information from listening to friends' recordings as a form of audio practice reports, so that it will form the character of mutual cooperation.



The principle of equality that is applied by the lecturer at the beginning of learning, namely joint prayer followed by all students will shape the religious character. Hoon [12] asserted that the disciplinary technology of teacher authority in instruction in joint praying is a way of religious practice that can build religious communities. Then in Pancadarma humanity, Trilogy understand, ngrasa/feeling, nglakoni/put into action, three-N (elaboration) lecturers apply compassion towards students which is realized by giving information voluntarily at the project evaluation stage and guiding practice patiently. A sense of love for others shown by the lecturer will shape the nationalist character in students. Building individual nationalist character of students is done by using three approaches, namely organizational approach, social system approach, and cultural approach. Social approach uses fostering (loving) methods related to teacher's social competence that will imply their relationship with students[13].

Integrity is a key character attribute as a basic component of leadership ethics. The essential nature of integrity is inherent in the soul of the leader, as the key to the success of his leadership [14]. In the realm of education as a leader in the class is a lecturer. With the implementation of the Trilogy values of leadership, *Ing Ngarsa Sung Tuladha, Ing Madya Mangun Karsa, Tut Wuri Handayani* in the project planning stage to evaluation, where the lecturer emphasizes the work of the report with full honesty / no plagiarism of the work of friends and using their own language in making a tutorial indicator dial measurement, providing motivation to continue to hone measurement skills as a knowledge to enter the world of work and ensure the results of pure reports of individual work will have an impact on the character of integrity.

#### IV. CONCLUSION

Project based learning integrated to Tamansiswa studies method can effectively increase the value of students' character with an effective contribution of 18.2%.

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#### REFERENCES

1. W. N. Bender, *Project based learning: Differentiating Instruction for the 21st Century*. California: Corwin, 2012.
2. D. Ratnawati, "Kontribusi Pendidikan Karakter dan Lingkungan Keluarga Terhadap Soft Skills Siswa SMK," *J. Kegur. dan Ilmu Tarb.*, vol. 1, no. 1, pp. 23–32, 2016.
3. S. W. Capraro, Robert M. Slough, "Project-Based-learning an Intelegrated Science. Technology, Engineering, and Mathematics (STEM) Approach," *Sense Publ. Rotterdam Netherl.*, 2009.
4. Setuju, "Implementation of Project Based Learning Model for Improving Students Learning Aoutcomes of Advanced Machining Engineering in Universitas Sarjanawiyata Tamansiswa," *Vanos J. Mech. Eng. Educ.*, vol. 2, no. 2, pp. 1–10, 2017.
5. S. M. Towaf, "The National Heritage of Ki Hadjar Dewantara in Tamansiswa about Culture-Based Education and Learning," *J. Educ. Pract.*, vol. 7, no. 23, pp. 167–176, 2016.
6. J. M. Steven, *Instructional System Design (ISD): Using The ADDIE Model*. College of Education: Penn State University, 2000.
7. J. W. Thomas, "a Review of research on project-based learning. California: the autodesk foundation 111 McInnis Parkway," 2000.
8. W. and Asrowi, "Effectiveness of Social Science Learning Based on Noble Values of Ki Hajar Dewantara's Teaching to Strengthen the Students'character," *Int. J. Act. Learn.*, vol. 2, no. 1, pp. 1–11, 2017.
9. Suratman, *Pokok-pokok keTamansiswaan*. Yogyakarta: Majelis Luhur Persatuan Tamansiswa, 1987.
10. M. Muthoifin and Jinan, "Pendidikan Karakter Ki Hadjar Dewantara: Studi Kritis Pemikiran Karakter dan Budi Pekerti Dalam Tinjauan Islam," *J. Stud. Islam*, vol. 16, no. 2, pp. 167–180, 2015.
11. Istiningih, "Contribution of Religion and Media Awareness In Building Character Appearance In The Family, Campus, Community, And In The Self (Study Of Student Perceptions In Yogyakarta)," *J. Educ. Pract.*, vol. 4, no. 9, pp. 71–79, 2013.
12. C. Y. Hoon, "God and Dicipline: Religious Education and Character Building in a Christian School in Jakarta," *Res. Collect. Sch. Sci.*, vol. 22, no. 4, 2014.
13. D. and A. Sulisworo, "Modeling the Nationalism Character Building Through Hidden Curriculum Attachment for Hight School Student at Frontier Area of Indonesia," in *4th International Conference the Community Development in ASEAN*, 2017, pp. 165–173.
14. J. C. Sarros, "Building Character: a Leadership Essential," *J. Bus. Psychol.*, vol. 1, no. 1, 2006.

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