The Integration of Collaborative Problem Solving with "*Piil Pesenggiri*" Local Wisdom to Build Scientific Attitudes

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Abstract At present, the education sector continues to face challenges in preparing the future generation. In this 21st century, the output of education sector is not only regarding the intelligence level of students; sufficient skills and attitudes should also become a consideration. Various measures are done by all actors associated with the education sector. One of the efforts that can be done as the form of contribution toward education sector is by performing innovations in learning patterns. The learning model of *Piil Pesenggiri* Team Work Learning (PPTWL) is developed based on the local wisdom of Lampung people. PPTWL is aimed to develop collaborative solving skill and scientific attitudes of students. This model is designed to be able to provide the opportunity for students in achieving learning purposes by integrating local culture values. One of the supporting elements in the model's realization is through the availability of module supplement as the learning platform for students. This study is a research and development (R&D) of education on PPTWL-based learning module that has five components: orientation, relating, exploration, transferring, and evaluation. This study used Thiagarajan's 4D development model, namely define, design, develop, and disseminate. The sample used in the small test amounted to 10 students and the big test used 27 students as the

sample. The test results showed that the N-Gain of students' scientific attitudes was 0.49%, which was categorized as moderate. This outcome showed that the PPTWL module provided impacts on students' scientific attitudes although it has yet to be optimal. The result of a module development which was based on *Piil Pesenggiri* Team Work Learning was responded positively by science teachers and the responses were categorized as very good.

Keywords CPS, Local Wisdom, Scientific Attitudes

1. Introduction

Local culture is a unique identity in a society [48],[34] which is made as a habit in a community group and doesn't have any similarities with other regions. Culture itself is defined as the habit that has been applied for generations by a community group. Alam [1], Human and culture are two elements that jointly formulate life. Humans in a community group play a role in creating, developing, growing, and preserving culture. There will be no culture without the community, so does the opposite.

One of the strengths given by God toward humans is common sense. Humans are given with the ability in the form of awareness toward what has been encountered or what is referred to as experience. This awareness triggers humans to analyze what is happening, arrange a formulation, limitation to be set, defining, and formulating theories related to experiences or activities in a group of community. This is what is called as culture. A state must be having various local cultures due to the difference in location. Local culture itself reflects the typical characteristics of a certain community, which means noble and high values. Implicitly, local culture established in a community group will completely shape and grow the identity of the members.

The continuous development of culture might support the continuity of culture life, which is impactful and having characters, identity and integrity of Indonesian people. This matter becomes one of the factors that determine the strength and resilience of Indonesian cultures toward the impact from inside or outside cultures or the impact caused by internal and external factors. Cultural resilience is interpreted as the capability of a culture to maintain its identity not by denying all foreign elements, but by filtering, selecting, and modifying the elements of foreign culture if required, in such a way, to make those elements compatible with the characters and image of the nation, Sedyawati [41].

There are lots of elements that can affect the culture which exists within the community at present. The rapid development due to global influences passed through various media that can be accessed by all community, so they cannot be suppressed or mitigated. Therefore, a movement to control the influences is required to be committed to discontinue the erosion of local culture value; otherwise the values will be extinct. Global influences will continue to flow; the negative impact that should be avoided is the vanishing of values conceived by a group of community. Thus, the strengthening is needed for the community itself. One of the efforts that can be done is by integrating the local culture with education. This attempt is expected to be able of giving the initial foundation for the future generation as the successor.

The diversity of local cultures owned by Indonesia is an amazing asset. One of them is *Piil Pesenggiri* culture; one of the cultural heritage that should be preserved. *Piil Pesenggiri* itself is an order used by the community who lives in Lampung Province. The values of *Piil Pesenggiri* is perceived as laws that are not only limited to a thought or concept, but as a system of value that is made as the basis and be implemented by the community itself. This is what makes *Piil Pesenggiri* to have important values and looked equal with the dignity and pride of the community group.

Based on the philosophy of life that guides the people of Lampung, they have something in common with the so-called *Piil Pesenggiri*. *Piil Pesenggiri* itself is a

socio-cultural potential of the Lampung area which is interpreted as a source of motivation so that everyone is dynamic in an effort to fight for positive values, live respectfully and be respected in the midst of community life. As a result of this, the people of Lampung are obliged to control their behavior and maintain their good name in order to avoid dishonorable attitudes and actions.

Piil Pesenggiri as a moral order provides a guideline for the behavior of each member of society as an individual and a social being in the Lampung customary environment to produce his work. *Piil pesenggiri* is a unit of four elements which include *Juluk-adek*, *Nemu-nyimah*, *Nengah-nyappur*, and *Sakai-sambaiyan*. If these four elements are fulfilled, then the people of Lampung can be said to have possessed the *piil* of a high-moral or high-spirited *pesenggiri*, so they can always live logically, ethically and aesthetically.

A rule is needed as a barrier in behavior to build a good life. Rules contain prohibition and obligation to be applied by every member of society. This is a means of forming individual attitudes and behavior in a society. So that it is hoped that there will be peace and harmony in social life.

The fading of nation cultures had caused many impacts, for instance, the society structure that starts to encounter social inequality. This is what should be the early warning of how this nation should start to think about the importance of promoting, maintaining, learning, and preserving local cultures as an integrative part in the learning process at schools. Education plays a role in the enculturation process which is functioned to preserve the values that have been existed since the past to the future generation. These values are wrapped in a local culture conceived by various community groups as a distinct symbol and pride. The duty of education is not only as a preserving platform but also as an institution that can develop the existing cultural value according to the present and future life as the foundation of nation characters. The standard of education should not only be limited to the intelligence of the students, but also the success in embodying the attitude of social morality from each student related to the culture and social life of the community.

Education is a platform that works as a creator of future generation and to enrich the life of nation. This implies that education gives its portion as the facility to process and produce knowledge from various wisdoms and policies. The development pillar of civilized and dignified nation is handed over through education. Therefore, education must survive in facing the development era to ensure that the education sector still has clear purposes. The swift current of globalization generates a distinct concern on the gradual erosion of local cultures. This will become the crisis of national identity as an problem that should be managed in the education and cultural sectors. Both are the two sectors that become the main bridge in preserving cultural values for the future generation.

2. Materials and Methods

This study is a research and development (R&D) of education to produce a science learning module by integrating the learning model of collaborative problem solving and local wisdom of *Piil Pesenggiri* which is aimed to build the scientific attitudes of students. This development research used the model initiated by Thiagarajan that has four phases or commonly called as 4D development model. The sample in this study was 27 students of science class in the eighth grade of Junior High School during the even semester. The data collecting instrument in this study includes questionnaire, interview guideline, and test question.

Figure 1. Steps for 4D Model

In the define phase, data collecting was conducted by using questionnaire, interview, and literature study. In the design phase, the validation toward materials, language, and media was performed, the module draft in this phase is what was produced from the development results acquired during the define phase. The design phase was a phase of how to design what is required on the field based on the preliminary study. The develop phase is a follow-up phase that is performed after the draft had been finished with validation and revision. This phase performed a test toward the product draft acquired from a small class to observe the readability of the module. Then, the test conducted on a bigger class will indicate the response of students as the module user and the impact to the scientific attitudes of students. While in the last phase, i.e. disseminate, socialization was conducted in the MGMP forum of Science Teachers.

3. Results and Discussion

3.1. Define Phase

This phase is the initial step in conducting the development activities. The define phase was performed through some measures, namely literature study, field survey, and by analyzing what is currently required by students and teachers at schools in the learning process of science. Literature study is a process in which the researchers find the correlation within science learning by applying collaborative problem solving, which if being integrated with the local wisdom *Piil Pesenggiri*, it will create a learning model which could later improve students' scientific attitudes. The importance of literature study is as a foundation on how a research has its urgency, therefore, a further study and development is required.

The research results recommended that CPS examine the characteristics of native students and cultural contexts, which later empirical test was performed to clarify the

nature and dimension of the teamwork process [12],[47]. The results of literature study on Collaborative Problem Solving (CPS) approach [19],[49],[51],[56],[55] has yet to review the assessment on the achievement reward of CPS group to improve the positive interdependence between the expert and the novice students in their CPS process.

3.1.1. Collaborative Problem Solving (CPS)

Collaborative can be defined as a cooperation done by some individuals. Collaborative learning can be interpreted as a learning and education approach that combines the intelligence between fellow students or between students and teachers jointly to be able of creating activities that involve the activeness of students in cooperating to solve problems, completing an assignment, and creating a product with the same goal in a work unit [33],[13]. Collaborative problem solving (CPS) is a cooperation done by two people or more in a group in accomplishing a specific goal together by constructing the self-knowledge conceived by each group member [13],[38].

Collaborative learning has five important elements in the learning process, namely the existence of togetherness on each group member; the presence of interaction between the group members as a form of mutual care and support between them; honing the communication skill of each member and accustoming a good communication with others; the presence of responsibility, not only individually but also in group in solving a specific goal; as well as the presence of evaluation on the collaboration toward the function and skill of each student in cooperating as the group member, Gunawan [22].

Collaborative problem solving is the integration between problem-solving based learning and group or cooperative learning. One of the things that affect the learning process is the environment. Creating a learning environment that supports the students to be in group and to collaborate naturally and effectively becomes an aspect that should be considered and prepared accordingly. This will give an experience and construct a new knowledge for students.

The characteristics of collaborative problem solving (CPS) can be described as follows: First, the CPS learning facilitates the group to have similar goals in the process of solving new encountered problems by formulating a plan from the initial condition available in every problem as an initial step to solve them without any guidance for solution [35],[39]. Second, in the CPS process, every group member has the opportunity to evaluate each other about whether the group goal has been achieved or not. In other words, the evaluation during the problem solving process can be seen and improved by the group members. In this explanation, CPS should not obligate that every given problem can be solved, but it concerns more on how every group collaborates in building knowledge and cooperation. Therefore, the scope of knowledge that can be acquired is measurable after the students individually

receive their grades based on the test results regarding the material; Third, the presence of role differences; Fourth, the interdependence between group members. Each group member will give his/her contribution in solving the given problem, so there will be various ways in solving the problems.

Collaborative learning has strengths and weaknesses. The strengths of collaborative learning include the more easiness in solving a problem collaboratively due to the presence of role division and evaluation, therefore, each member can improve their self-quality; collaborating means having a discussion partner, so the source of knowledge will not only come from the students themselves (lots of source), there are various perspective in solving the problem while also increasing the experience; there are good interdependency and interaction between the group members, therefore, they can generate new ideas and develop more self-quality through the interaction. While the weaknesses of collaborative learning are; if the communication done during the group discussion did not run properly and efficiently; poor interaction between members; the negligence of responsibility or relying to other group members; there is a conflict and disagreement.

Collaborative problem solving skill is the capacity of individual to be effectively involved in the cognitive and social processes in which two or more students attempt to solve the problem they face [27],[10],[45]. The PISA assessment is a test done individually toward students, however, this assessment has the CPS judgement (cognitive and teamwork dimensions). The problem solving dimension in the 2012 PISA framework is the competences that target individual problem solving [45],[20],[25], these are the indicators: exploring & understanding; representing & formulating; planning & executing; monitoring & reflecting (Graesser, Fiore, Greiff, Andrews, Foltz & Hesse) [24]. There are three processes in the collaborative dimension of 2015 PISA: First, establishing and maintaining shared understanding; second, taking appropriate actions to solve the problem; and third, establishing and maintaining group organization (Graesser, Fiore, Greiff, Andrews, Foltz & Hesse) [24].

Table 1. The Indicators of Collaborative Problem Solving Skill

Indicators	Operational Definitions
<i>Participation</i>	Students able to identify and be involved in collaborative problem solving.
<i>Perspective Taking</i>	Students able to adapt the contributions or clues from the other group members as the solution in collaborative problem solving.
<i>Social Regulation</i>	Students able to evaluate themselves in collaborative problem solving.
<i>Learning and Knowledge Building</i>	Students able to connect multiple parts from various kinds of information and plan a collaborative problem solving strategy.
<i>Task regulation</i>	Students able to understand and implement the collaborative problem solving strategy systematically.

Collaborative problem solving (CPS) skill consists of two broad skill categories, namely social and cognitive skills (Hesse, Care, Buder, Sassenberg, & Griffin) [27]; two components that affecting each other. Social skill is the part of CPS which is associated with the management of group members; including themselves, while cognitive skill is the management of task that will be solved. The cognitive skill tends to be similar with individual problem solving. Social skill is needed for students to be successful in collaborative problem solving. Conceptually, social skill is divided into three indicators, namely participation; perspective taking; and social regulation. The success of CPS is not all about social skill, but also about the cognitive skill. The cognitive skill is more about how to solve the given problem, from the planning, implementation, or evaluation. Problem solving skill consists of two indicators, namely task regulation & learning and knowledge building (Hesse, Care, Buder, Sassenberg, & Griffin) [27].

3.1.2. Scientific Attitudes

One of the purposive aspects in studying the knowledge about nature is establishing scientific attitudes on someone [15],[28]. The tendency of someone in encountering scientific problems will stimulate actions that compatible with the scientific procedure as well. In other words, the problem solving will be done more systematically. Scientific attitudes can be defined as a tendency of someone in behaving if faced with problems and attempting to solve the problems with systematic and scientific measures. The factors that affect scientific attitudes include curiosity, information, group affiliation as well as personality.

Scientific attitudes are the attitudes that should be owned by academicians [46],[32],[5],[40],[17],[26],[6],[4], which will help students in solving a learning problem properly. This will surely substantiate the argument that the scientific attitude is one of the aspects that needs to be applied in the learning process. The learning process done at schools used various models, adjusted to the characteristics of students, materials, and the availability of facilities and infrastructures. In principle, the model used by teachers had integrated students' scientific attitudes in every learning process. However, students are often unaware of this thing, so they (scientific attitudes) are not embedded properly on students. The learning theory according to Dewey and Friere explained that students can build knowledge from the experiences they acquired in their environment. This argument clearly indicates the importance of learning integrated with local wisdoms as one of the media or platforms in delivering the content of learning material. Local wisdom will give a concrete example of the problem which will be encountered by students, so it helps students to be more interactive during the learning process.

Such issues sometimes get less attention from the

teachers during the learning process. The lack of emphasis on this condition causes the obtained output to be less effective although scientific attitudes have been integrated within the process. This is surely become a task that should be overcome by teachers at schools by seeing the urgency of scientific attitudes themselves on the mindset of students that will be generated later on. Through the activities that stimulate the students to participate in the interaction to build their own knowledge, teachers are able to innovate in conducting the learning process by not only in determining the model that will be used to deliver the materials, but also by giving more creativities in providing other supporting elements, such as students textbooks, student worksheets, or observation sheet that are integrated with scientific attitudes. This will direct and accustom the students systematically during the learning process [53],[11],[30],[18],[42].

3.1.3. Piil Pesenggiri

Local culture is a typical characteristic that grows, develops, and owned by a community group in a certain place [44],[22]. Local culture often exists and grows due to the hereditary legacy preserved by the people. The congruity between social life and mindset becomes the root of the development of the local culture itself. One of the local cultures conceived by Indonesia is *Piil Pesenggiri* (Lampung). *Piil Pesenggiri* is an identity of Lampung ethnic (*ulun* Lampung). *Piil Pesenggiri* contains rules or norms that become the basis of *ulun* Lampung in their daily life. *Piil Pesenggiri* is produced based on the interpretations on values that can strengthen the bond between Lampung ethnic with the migrants (ethnics who came in due to the transmigration program in Lampung). This condition is certainly based on needs and the effort to complete each other so a symbiosis relationship is established, Sinaga [43]. In a multicultural life due to the transmigration program, *Piil Pesenggiri* is able to harmonize the life of Lampung natives with the migrants. This can be made as the adoption model for the kinship system as the preventor of conflict [2],[37].

Piil esenggiri is mentioned in the Scripture of *Kuntara Raja Niti* as the customary law scripture of *ulun* Lampung that contains normative and life guidelines. *Kuntara Raja Niti* Scripture has 17 chapters with three main legal discussions, namely *Kuntara* (religious laws); *Raja Niti* (*dirgama* or conscience); and *Jugul Muda* (the cause of an act). *Piil Pesenggiri* simply can be understood as the principle of honor. *Piil Pesenggiri* itself has four aspects, namely *bejuluk beadek*; *nengah nyapur*; *nemui nyimah*; and *sakai sambayan*.

Figure 2. The Components of *Piil Pesenggiri Teamwork Learning Model*

Etymologically, *bejuluk beadek* has two words, namely *juluk* and *adek*. *Juluk* is a nickname given to someone when he/she is still young or a teenager and is not married, while *adek* is a title or a name given toward someone who is married or through the procession of giving a customary title. This definition explains that *bejuluk beadek* is close and attached to each individual. Therefore, the name should be properly honored by a person who is a part of the community, through the attitude and behavior showed in the social life every day. One of the ways to show this is to be able to maintain the rights and duties in daily behavior and works. Linguistically, *nengah nyapur* can be defined as a sociable attitude or tolerance between people. *Nengah nyapur* also illustrates a high curiosity, therefore, it is expected that Lampung people should have a persevering spirit and hard-work to reach a better future. From the definition itself, *nengah nyapur* reflects that Lampung people always perform discussion to reach an agreement. Therefore, every individual should have a broad knowledge, a responsibility, and respect toward others.

Nemui nyimah consists of two words, *nemui* and *nyimah*. *Nemui* comes from a noun "*temui*" which means guest, while *nyimah* comes from a noun "*simah*" which means generous. In principle, *nemui nyimah* is the establishment of Lampung people's character in getting used of being sincere in creating a harmony. The concrete example in the context of life within the community is social care and friendship. *Sakai sambayan* has the meaning of mutual cooperation or helping each other. Principally, *sakai sambayan* is the action of a high sense of solidarity, so each individual will voluntarily help each other and be generous to those in need.

Piil Pesenggiri itself if seen from the explanation above is the initial characteristic required to be preserved in the society life. In establishing a good system in a society, rules or norms that can be made as the limit or warning in life itself are required, either personally or in socializing within the society.

3.1.4. PPTWL Model

In conducting their main duty of teaching, educators are demanded always to be creative in creating ideas during the learning process to achieve learning objectives. Teachers have the duty to design a learning process that can be followed by students to achieve the target and shape their knowledge. In holding this purpose, innovations are required in conducting the learning process in which one of them is by conducting a development or innovation on the learning model. Learning model is a conceptual and operational framework which has a broader meaning than the learning strategy, method, or procedure. In general, it can be defined as a systematic measure to organize learning activities as well as to accomplish the learning objectives. In the learning model, there is a sequence of presentation aspects which are before, during, and after the process of

delivering materials in a learning process. In this sequence, teachers should also prepare the related facilities, either directly or indirectly.

Piil Pesenggiri Team Work Learning (PPTWL) model is one of the results of the development innovation of collaborative and problem solving models. This model is developed with the aim to grow collaborative problem solving skill and students' scientific attitudes. PPTWL is the innovation of learning model that integrates the local culture of Lampung people, namely *Piil Pesenggiri*. *Piil Pesenggiri* itself is a local culture of Lampung people that stipulates the order of behavior of the community [31],[2],[37]. A learning model that integrates local culture is expected to be able to help students in receiving learning materials properly because it will be more contextual or close with students' daily life and activities.

Figure 3. The Syntax Development Flowchart PPTWL Model

The demand for the current era development obligates every individual to be ready to work in teams by considering the intelligence. One of the efforts that can be done in the education process is by accustoming students to a condition or built-in system group to construct the knowledge they are seeking to discover. Teachers work as the educator who facilitates activities designed to accustom and establish the skill to collaborate with teammates. PPTWL itself is designed for such purpose, building problem solving collaboratively without abandoning the community; local culture elements in which local culture is one of the assets owned by a nation to establish future generation who loves their culture and nation.

Piil Pesenggiri is one of Lampung's local cultures which if studied comprehensively can be used more widely because the *Piil Pesenggiri* itself had been adjusted to be applied in multicultural areas in Lampung. This is compatible with the condition of Indonesia that is very diverse. The expectation that comes afterward is for the PPTWL to be implemented and giving positive impacts on the education sector in Indonesia.

Figure 2 is the graphic that describes the correlation between problem solving model, collaborative model, and local culture of *Piil Pesenggiri* as the new learning model. While the design of the PPTWL model development itself can be seen in detail in Figure 3. The steps of *Piil Pesenggiri* Team Work Learning model are:

1. **Orientation**, (group division, motivation, informing the learning purpose, informing the activities that will be committed).
2. **Relating**, (integrating local wisdom with learning material)
3. **Exploration**, (problem identification, planning, and implementing the problem solving strategy, analyzing and creating solution).
4. **Transferring**, (discussing to express the problem solving measure in each group and between groups)
5. **Evaluation**, (evaluating the process and the result in learning, giving rewards to students)

This PPTWL model is aimed for students to be capable of improving collaborative problem solving skill, improving scientific attitudes, and able to construct knowledge based on the integration with the existing local culture. PPTWL learning model is designed by integrating the local culture of Lampung as one of the innovations done in the learning as the acculturation process. PPTWL process is based on *Piil Pesenggiri* by adapting its pillars applied in the learning measures as one of the adaptation measures on the value contained in the society, and also be capable of developing problem solving skill collaboratively and systematically.

3.2. Design Phase

This phases was the phase when the researchers created a draft based on the adjustment with the result from the define phase. The researchers created the module based on PPTWL model as the development between problem solving learning and local wisdom of *Piil Pesenggiri*. The module development referred to the argument of Prastowo which has minimal components, including the title of module; general instructions that consist of basic competences, references, learning strategies, methods, syntaxes); instructions for students; student activity sheets, and materials.

The result of design phase in this study was the developed module encompassing several components: cover, half-title, preface, concept map, introduction, materials, practice questions, answer keys, and author's bibliography. The created module is equipped with student work sheets to support the group learning, so it facilitates students in the learning process. The development of this teaching material used the basis of *Piil Pesenggiri* Team Work Learning (PPTWL) model in which the model itself consists of several components: orientation, relating, exploration, transferring, and evaluation. The detail is presented in Table 2.

The developed module contains a material about "the properties of materials and their utilization in daily life that consists of four primary materials, namely fiber material, rubber material, clay and ceramic material as well as glass and wood materials. In each part of the material, students will learn about the classification and the properties of materials as well as the utilization of those materials in the daily life.

Natural science is one of the subjects that is related closely to the daily life. Unconsciously, activities conducted daily are sometimes the process of natural science itself or related to the symptoms of natural science. This module is designed to help teachers and students in understanding the local wisdom or the habit that often be found in the environment of Lampung people and related to natural science. The contents of local wisdom raised in this study were the Lampung custom house "*sesat*", Lampung *Tapis* fabric, Lampung "*siger*" crown, how to harvest the resin of rubber, pottery as well as the rope-skipping game.

These local wisdoms are made as the content to deliver science material with the sub-subject on the properties of materials and their utilization in the daily life. This is one of the components of PPTWL, i.e. relating.

Table 2. The Components of *Piil Pesenggiri* Team Work Learning

Components	Icons	Activities
Orientation		Teachers give direction about the learning objectives and explain the scope of material that will be reached at the end of the learning process.
Relating		Students observe the activities or cultures that occur in the daily life. In which these events are related to the science material that will be studied, so the curiosity of students will be stimulated.
Exploration		Students in groups perform a problem solving toward a problem given by the teacher.
Transferring		Students open a discussion in every group in solving collaborative problem to transfer and strengthen the students' collaborative problem solving skill. Each group report and explain the finished measure and solution to the class
Evaluation		Teachers and students evaluate the process and output of the learning process. Then, teachers give rewards over the achievement of collaborative groups by giving additional point for each group.

cannot be fully read. After the revision was performed, the PPTWL module draft was used in a bigger class. The sample used for this amounted to 27 students of Junior High School in the eighth grade.

Table 3. The Validation Results of PPTWL Module

Validators	Validation Results	Revisions
Lecturer 1	There were some mistyped and repeated texts. The image used as the cover has yet to illustrate the title and content of the module.	Improving the writing in PPTWL module. Improving the cover by replacing it with the image that suits the theme to be attractive.
Lecturer 2	The supporting images in the module were still lacking. Some images were missing their sources. Some writings in the module were still improper.	Improving the supporting images in the module Inserting the source of images used in the module. Improving the wrong writings in the module.
Science Teacher	The writing of the sentences still needs to be re-corrected, typo often occurred and sentences were incomplete. Students should be given a space to answer the practical activity and question, so it will be easier to use.	Improving the typo in the module. Giving space for students' answers in the model.

3.3. Develop Phase

The initial step in this phase was validating the product draft (module) that being developed. The validation was performed by two lecturers and one science teacher. The validation result of PPTWL-based module can be seen in Table 3.

The revision of the first module draft was adjusted with the recommendation given by the validators, so the second module draft was produced. Then, this result was ready to be tested in a small scope, with 10 students as the sample. This step is also an important component in research and development, in which the purpose of this step was to see if the second PPTWL-based module draft is capable and ready to use. The first trial was performed on a small class that focused on the writing in the module, the appropriateness of the language used, the position of images, the clarity of command and segments of the module as well as the attractiveness of PPTWL module that being developed.

The result of this phase indicated that there were some mistyped words and inappropriate sentences; there were images that covered the text in some parts, so the sentence

The test in the big class was aimed to observe the effectiveness and response of students on PPTWL module that being developed. The development of learning materials that are based on local culture gives positive impacts on students' science literacy skills [52],[54],[14],[16]. This study result substantiates that integrating local wisdoms will facilitate students in receiving the learning material delivered by teachers.

Students' response results showed that 95% of students expressed their happiness during the course of learning activities; 85% of students expressed that they understand the subject on the properties of materials and the utilization in the daily life, 85% of students expressed that the PPTWL module that has been developed helps the learning process while 95% of students agreed that the PPTWL module has been good. Gain test was used for the analysis of the variable of students' scientific attitudes. Gain test was used to see the disparity between the initial grade of students' scientific attitudes and after the application of PPTWL in the learning, then, the N-gain was determined. The measurement result is presented in Table 4.

Table 4. N-Gain of Scientific Attitudes of Students

N	Initial	Final	gain	N-Gain	Categories
27	36.00	72.22	36.22	0,49	Moderate

Local wisdom gives good impacts on students' science skills [52],[54]. In this study, the learning by using PPTWL module as the development of problem solving learning model and local culture of "*Piil Pesenggiri*" was made as the platform for students in developing and accustoming scientific attitudes in the learning process. This effort is aimed to accustom students to always act based on scientific attitudes in their daily life, so that the local wisdom is integrated into learning process, either on the teaching materials, learning models or other supporting instruments in the learning process. Introducing students from the closest elements in their environment, in order to facilitate, accustom, and provide direct experiences during the learning process for students, especially concerning the science materials. Table 4 shows that the gain of students is 36,22 with 0.49 of N-Gain which categorized as moderate. This result shows that students' scientific attitudes have been good but still yet to be optimal. Some evaluations are required in the learning process, including the appointment of leaders in each group that needs to be reviewed, the issue that some students did not follow the procedure according to the instruction, and the lack of initial explanation about book utilization.

3.4. Disseminate Phase

In this phase, the socialization was performed in the Discussion Forum of Science Teachers (MGMP IPA) of East Lampung. Every member of MGMP IPA was given the module and respondent questionnaire to give the assessment on PPTWL module developed in the subject on the properties of materials and the utilization in the daily life. The result and response of the teachers as the members of MGMP IPA were categorized as very good.

4. Conclusions

The development of PPTWL module is one of the supporting supplements in culture based learning process. In this study, the produced module is the integration with the PPTWL model which then used Lampung local wisdom as the content in delivering the subject of "the properties of materials and the utilization in daily life". This module used five components of PPTWL, namely orientation, relating, exploration, transferring, and evaluation, of which each step is an adoption of "*piil pesenggiri*". The orientation stage contains the meaning of "*nemui nyimah*" which shows scientific attitude in the form of being diligent and curious. Relating and

evaluation is a reflection of "*nengah nyapur*" with respect toward data/ facts, and sensitive to the environment. The exploration stage is a description of "*bejuluk beadek*" with scientific attitude in the form of critical thinking, an attitude of discovery and creativity. Then the transferring stage is an application of "*sakai sambayan*" which shows an open minded attitude and cooperation. The development of this module is expected to be able to influence students' scientific attitudes in the learning process of science, and the study results showed that 0.49% of N-Gain or moderate category was acquired on students' scientific attitudes. This result is consistent with the previous studies which expressed that the learning which integrates local wisdom provided positive impacts toward students' literacy of science and their science processing skill [52],[54],[14]. Many studies resulted in a positive trend on learning outcomes acquired by integrating the learning with local wisdoms. This result should become one of the considerations for the future, for the researchers to conduct further and more various studies, as the innovation in education and local wisdom.

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