CHAPTER IV

RESULT AND DISCUSSION

4.1 Overview of The Research

This research is a Research and Development (R & D) which includes analysis of curriculum textbook 2013 used in schools, development of teaching materials and standardization of teaching materials that have been developed. The research that has been done is aimed to produce chemistry teaching materials that integrated the PBL model which is done in grade X senior high school. The developed teaching materials must meet the quality standards as required by BSNP and the composition of the materials prepared in accordance with the contents in the curriculum syllabus 2013. The first stage of this research is to analysis chemistry teaching materials grade X that are widely used in schools in Medan. Based on the results of the analysis, in the next stage carried out the development of the teaching material that used in schools with Integrated PBL model. Then, validation of teaching materials that have been developed by expert validators consisting of lecturers and teachers using BSNP form include the content feasibility, language feasibility, presentation feasibility, graphics feasibility, and feasibility of presentation-based syntax of PBL model. In the final stage that is done by a limited trial to get students' responses to teaching materials that have been developed.

4.2 Analysis of Teaching Material Grade X that Used In School

There are three teaching materials used in schools that are analyzed by using BSNP form. This analysis is conducted to get information on what things should be improved or added to the developed teaching materials. The identity of three teaching materials analyzed is shown in Table 4.1.

Table 4.1 Identity of teaching material that analyzed

Initial of Teaching Material	Author	Publisher	Curriculum	Name of Teaching Material
A	Unggul Sudarmo	Erlangga	2013	Kimia Untuk SMA/MA Kelas X
B	Watomi, A.H	YramaWidya	2013	Kimia Untuk SMA/MA Kelas X
C	Riandi Hidayat	Yudhistira	2013	Panduan Belajar Kimia 1B

The standardization test based on BNSP includes 4 aspects: (1) content feasibility; (2) language feasibility; (3) presentation feasibility; and (4) graphics feasibility. The data obtained is a description on the teaching materials with qualification in the form of check list (√) in column score 1 to 4 that is: (1) very good; (2) good; (3) pretty good; and (4) bad. In addition, in this study also provided additional standardization test that is feasibility of presentation based on the syntax of PBL model. The following described the results of the analysis of teaching materials used in schools.

4.2.1 Analysis of Teaching Material A

The analysis result of teaching material A is shown in Figure 4.1.

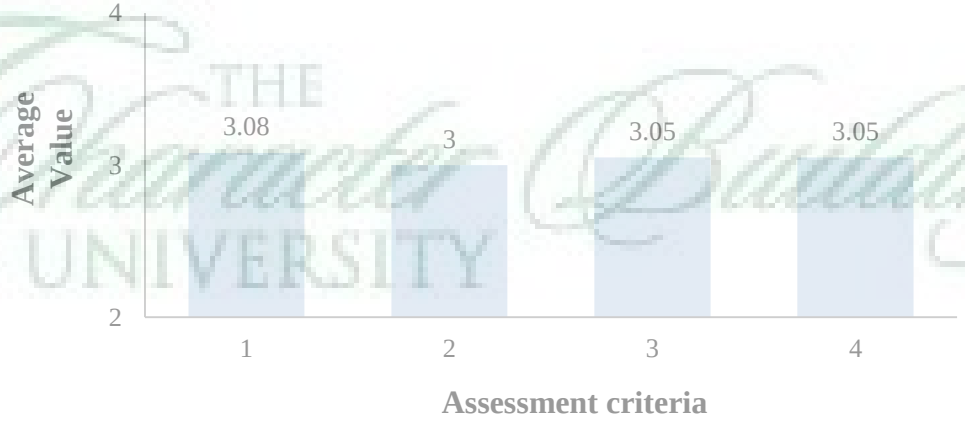

Figure 4.1. Analysis result of teaching materials A based on BNSP

Based on the figure 4.1 can be seen the results of analysis teaching materials A based on BSNP as a whole has average value that is : (1) content feasibility test as much as 3.08 is quite valid and require no revision; (2) language feasibility test as much as 3.0 is valid enough and requires no revision; (3) presentation feasibility test of 3.05 is valid and does'nt require revision, and (4) graphic feasibility test of 3.05 is valid and doesn't require revision. Thus, the overall teaching material has an average value of 3,045 which is quite valid and does not need to be revised (Arikunto, 2002).

In part 1, it's related to the content feasibility even though the results of the analysis are valid and doesn't need revised but there are some aspects that can be developed related to the content of the book. Indicators of unfilled contents, such as the breadth of material, productivity insight, and life skills that have'nt been presented accurately. In addition to completing the breadth of the material, productivity insight and lifestyle then the book should be equipped with experimental activities.

For the language feasibility is valid and doesn't need revised but there are some criteria that need to be developed for be better, that is about the suitability of language as in explaining a concept, illustrating a concrete example up to an abstract example in accordance with student development.

Furthermore, the presentation feasibility is valid and doesn't need revised. But still need to do develop and improve as in making illustration of appropriate and appropriate on material in chapter so that easier for student to more easily understand about the material taught. Improvement of teaching material can also be done by making the answers key to the problems that exist at the end of the chapter, not accompanied by a way of solving the problem. This is useful as stimulating students' curiosity in conducting learning evaluations.

The feasibility test of graphic is valid and doesn't need revised but there are indicators that need to be develop that is in the selection of colors for each different section. The development is done in order to give more nuance and can clarify the teaching material material so that it can attract students attention through the choice of good color.

In addition to the deficiencies above, which is more important in teaching materials A is not integrated PBL model. This can be seen from the absence of syntaxs of PBL model, that is, (1) orienting learners to the problem; (2) organizing learners; (3) guiding individual and group investigations; (4) develop and present the work; and (5) analyze and evaluate the problem-solving process.

Problem based learning model is a learning model designed so that learners get important knowledge, which makes them adept at solving problems (think critically) and have their own learning models and have the skills to participate in the team. To improve students 'learning ability and critical thinking as well as improve students' skill in participating team, the teaching materials need to be developed. In addition to the development of the four aspects that have been described above are the content feasibility aspects, language feasibility, presentation feasibility, graphic feasibility, teaching materials need to be developed that is to integrate teaching materials with PBL model.

4.2.2 Analysis Result of Teaching Material B

The results of the analysis of the teaching materials are shown in Figure 4.2.

Figure 4.2. Analysis result of teaching material B based on BSNP

From Figure 4.2 can be seen the analysis result of teaching materials B based on BSNP as a whole has an average value that is : (1) content feasibility test

as much as 3.35 is valid and doesn't need revised; (2) language feasibility test is 3.33 is valid and doesn't need revised; (3) presentation feasibility test as much as 3,33 is valid and need doesn't need revised; and (4) graphic feasibility test as much as 3,37 is valid and doesn't need revised. Thus overall has average value of 3.345 that is valid and doesn't need revised.

In part 1, in terms of breadth and depth of material that has been presented accurately. The material presented is also able to cultivate students' curiosity and challenge students to learn more. However, although it's valid and doesn't need revised, but the teaching materials B need to be develop in the aspect of life skill development by presenting the experimental activities in teaching materials.

For language feasibility of the teaching material B is valid and doesn't need revised. The analysis result show that the aspects of language feasibility in the teaching material B has been presented accurately. The suitability of language as in explaining a concept describing concrete examples to abstract examples can be presented accurately and the material conveyed is also communicative, dialogical and interactive.

For presentation feasibility is valid and doesn't need revised because it's complete enough presented such as glossary at the end of chapters, bibliography, and summary at the end of book. However, the teaching material B still has to make improvements by adding an answer key. For graphic feasibility test is valid and doesn't need revised. But according to the researcher teaching material B need to do develop by changing the color of teaching materials to be more interesting so it can cause attraction for students to the teaching materials B.

In addition to the deficiencies above, which is more important in teaching materials A is not integrated PBL model. This can be seen from the absence of syntaxs of PBL model, that are (1) orienting learners to the problem; (2) organizing learners; (3) guiding individual and group investigations; (4) develop and present the work; and (5) analyze and evaluate the problem-solving process.

To improve students learning ability and critical thinking as well as improve students skill in participating team, the teaching materials need to be developed. In addition to the development of the four aspects that have been

described above are the content feasibility aspects, language feasibility, presentation feasibility, graphic feasibility, teaching materials need to be developed that is to integrate teaching materials with PBL model.

4.2.3. Analysis Result of Teaching Material C

Analysis result of teaching material C can be seen in Figure 4.3.

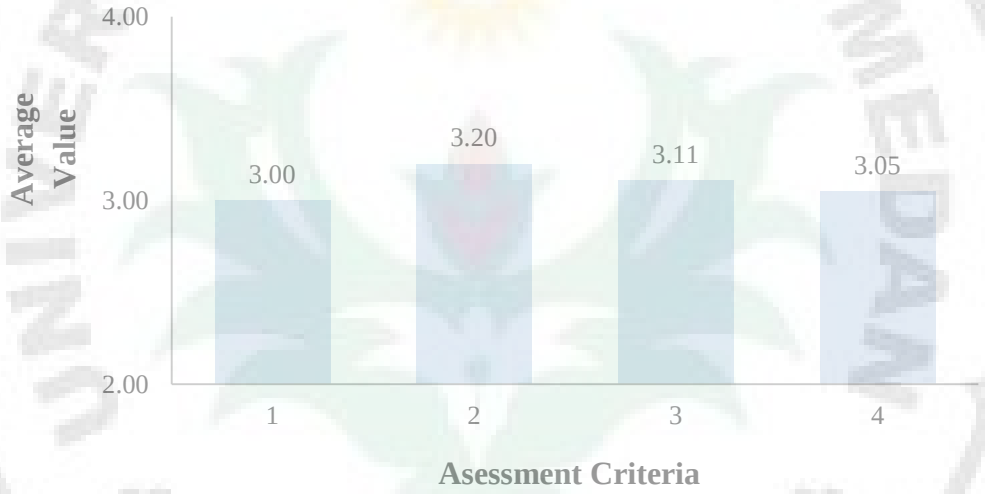

Figure 4.3. Analysis result of teaching material C based on BSNP

From the figure above, can be seen the analysis result of teaching materials C based on BSNP as a whole has average value that is: (1) content feasibility test as much as 3.00 is quite valid and doesn't need revised; (2) language feasibility test of 3.20 is quite valid and doesn't need revised; (3) presentation feasibility test of 3.11 is quite valid and doesn't need revised; and (4) graphic feasibility test of 3.05 is quite valid and doesn't need revised.

In part 1, related to the content feasibility aspects even though it's quite valid and doesn't need revised. But there are some aspects that can be developed related to the content of the book such as deepening and extending the scope of material presented and designing materials that can cultivate students' curiosity.

For language feasibility is valid and doesn't need revised, but there are some aspects that can be develop in teaching material submitted to be more communicative, dialogical and interactive. As for the feasibility of presentation,

need providing such as illustrations that are communicative and interactive that can facilitate students in learning the materials. Teaching materials also need to present key answers to stimulate curiosity towards the results of student learning evaluation. In addition to the deficiencies above, which is more important in teaching materials A is not integrated PBL model. This can be seen from the absence of syntaxs of PBL model.

Based on the explanation above, it can be concluded the chemistry teaching material grade X semester by A, B, and C teaching material is quite valid and doesn't need revised but needs to be developed to some aspect according to BSNP requirement. Then from the analysis results, not found teaching materials that are integrated with the model of learning problem based learning. So that researchers can make the analysis results as a material to develop teaching materials that are integrated with PBL model.

4.3 Planning and Development of Teaching Materials Integrated PBL Model

Based on the analysis result the researcher get the excellences and the weaknesses of the book. The development of teaching materials in accordance with the weaknesses found in the three teaching materials. The Excellences of these three teaching material can be seen in table 4.2 and the weaknesses of these three teaching materials can be seen in table 4.3 below.

Table 4.2 Excellences of teaching materials used in school

BSNP Criteria	Excellences of Teaching Materials
Content Feasibility	The depth and breadth of the subject material is quite complete and accurate
Language Feasibility	The language that use is easy to understand
Presentation Feasibility	In each chapter there are articles related to daily life about the subject matter
Graphic Feasibility	The images that used are in accordance with the topic and interesting

Table 4.3 Weaknesses of teaching materials used in school

BSNP Criteria	Weaknesses of Teaching Materials
Content Feasibility	• There is no experimental activities
Language Feasibility	• The Material presented not dialogical and interactive
Presentation Feasibility	• There is no illustration that can stimulate critical thinking skills • There is no answer key • There is not integrated PBL model
Graphic Feasibility	• The Selection of color in teaching materials is the less interesting • There is no discriminating color on the teaching materials

Furthermore, the weaknesses of teaching materials in the table above can be used as a reference so that the teaching materials to be developed are feasible to use. Development of teaching materials based on the weakness of the previous teaching materials can be seen in table 4.3 below.

Table 4.4 Development of Teaching Materials Based on Weaknesses of Teaching Materials Used in Schools

BSNP Criteria	Development of Teaching Materials Based on Weaknesses of Teaching Materials Used in Schools
Content Feasibility	• There are experimental activities in several chapters that allow experimental activity to be included
Language Feasibility	• The language that used in teaching materials is dialogical and interactive
Presentation Feasibility	• At the beginning of the chapter there are basic competencies and learning objectives • There are illustrations that can stimulate critical thinking skills • Integrated of PBL model that can improve critical thinking ability • Completeness of supporting material presentation contained in teaching materials (glossary, bibliography, answer key)
Graphic Feasibility	• The choice of colors and pictures presented more interesting

After the materials have been developed, the next step is to standardize the teaching materials using BSNP form and with help of expert validators to see if the developed teaching materials by the researcher are feasible to use or not.

This validation involves two lecturers and three chemistry teachers by giving assessment instrument of BSNP and 20 students to know the student response. After obtaining the result of the assessment based on the assessment of BSNP instrument, the researcher further improves the improvement based on the suggestion that has been received to get the better teaching material and feasible to use.

4.4 The Development Result of Integrated Teaching Materials of PBL Model

Preparation of teaching materials that are developed based on syllabus, competence standards and basic competencies. In addition, the main aspects that developed in teaching materials is the integration of PBL model. Integration is done by arranging the teaching materials in accordance with PBL syntax. The syntax of the PBL model are: (1) orienting learners to the problem; (2) organizing learners; (3) guiding individual and group investigations; (4) develop and present the work; and (5) analyze and evaluate the problem-solving process.

At the begin of each chapter, the teaching materials developed include basic competencies, learning objectives and characters developed and maping concept that serve to facilitate students in learning activity. Furthermore, integration of the first syntax is to orient learners to the problem by presenting the problem in the form illustrations based on the facts or events in everyday life. The illustrations presented also use a dialogical and interactive language. It's useful to stimulate students to think critically and to attract students' attention to learn the materials that are developed throughly.

In the second syntax, that is organizing learners done by displaying commands so that students formed groups and help students define the learning tasks associated with the problem by writing the problem in the form of question based on the illustration on the first syntax to be solved problem with the group. The formation of learning groups aims to develop life skills students.

In the third syntax is guiding individual and group investigations. In this syntax, the researcher presents a command in the form of an invitation to each group to solve the problem by seeking as much information from the description of the material that has been provided on the teaching materials. Teaching material material is presented by using dialogical and interactive language and also equipped with examples of problems to facilitate students understand the material being studied. After getting the information, the students in the group work together to solve the problems that have been presented.

Then in the fourth syntax is to develop and present the work. In this syntax the teaching materials presented blank sheets for students presents the answers to the problems that have been solved. In the last syntax is to analyze and evaluate the problem-solving process is done by presenting written commands for each group to make a presentation of the results problems-solving that have been solved. Each group was also instructed to responded the group presenting. This is intended as a form of student learning evaluation.

In addition, in the teaching materials are also presented with individual tasks in the form of additional questions that to be done by students themselves as a evaluation media to determine student learning outcomes. Problem given in the form of essay matter. Teaching materials are also equipped with experimental activities aimed to strengthening students' knowledge of the material being studied. In addition, experimental activities can also develop the ability to interact among students, improve the ability to work together and also can motivate students to cultivate the spirit of innovation, creativity and critical thinking.

As already known, teaching materials are developed based on the lack of teaching materials used in schools. In addition to the above explanation, the developed teaching materials are equipped with picture as illustrations that support the book explanation, summaries at the end of the chapter, glossary, questions at the end of the chapter (competency test), and answer keys at the end of the book section, facts relating to the material of study, table of reinforcement concepts, and attachments such as periodic system of elements that support the learning process.

For more details, the translation of the contents of teaching materials integrated PBL model can be seen in the following table 4.4.

Table 4.5 Translation of Introduction of Integrated Teaching Materials PBL Model

Teaching Materials Section	Content of Teaching Material
Introduction Section of The Teaching Material	- Foreword - Problem Based Learning Rules - Instructional Use Instructions - Core competences and Basic Competences - table of contents - List of Tables - List of Figures - Map Concept - Basic Competencies and Learning Objectives
Content Section of Teaching Materials	- There is syntaxs integration of PBL model - Learning materials - Chemical figures - Problems Example - Chemical Info (chemical facts) - Concept Reinforcement Table - Individual task
Cover Section Teaching Materials	- Summary - Evaluation Question - Bibliography - Glossary - Answer key - Periodic System Table

4.5 The Standardization of Teaching Material Integrated PBL model

To produce standard and feasible teaching material to be used, the teaching materials developed must be through standardization process (validation) by an expert validator consisting of 2 lecturers and 3 chemistry teachers of grade X. In addition, a limited trial conducted to get student responses as many as 20 students with high learning outcomes and students with low learning outcomes.

4.5.1 The Standardization of Teaching Material Integrated PBL model by Expert Validator

The assessment results of lecturers and teachers on teaching materials that have been developed are presented in Figure 4.4

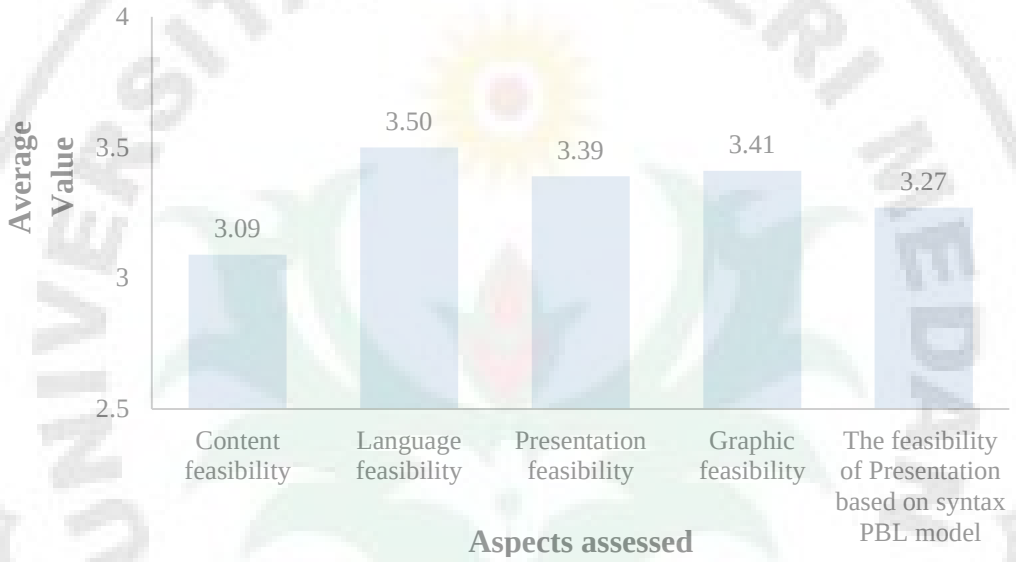

Figure 4.4. Level of feasibility of Teaching materials according to BSNP by lecturers and teachers as expert validator

The analysis result of integrated teaching materials of PBL model based on BSNP involve content feasibility, language feasibility, presentation feasibility, graphic feasibility and Feasibility of PBL model shows that the average value of 1) content feasibility of 3.09 show the teaching material is valid and doesn't need revised, 2) language feasibility of 3.50 show the teaching material is valid and doesn't need revised, 3) presentation feasibility of 3.39 means that the teaching material is valid and doesn't need revised, 4) The graphic feasibility of 3.41 means the validity of teaching materials is valid and doesn't need revised, then 5) Feasibility of PBL model based presentation of 3.27 means that the teaching materials are valid and doesn't need revised. The average result of the level feasibility of teaching material that developed is 3.34. It means the teaching material is valid and doesn't need revised so it can be concluded that the teaching material is feasible to use.

The five aspects of the feasibility of the teaching materials can be described as follows:

4.5.1.1 Content Feasibility

The analysis result of integrated learning materials of PBL model based on content feasibility aspect by Chemistry Lecturer and Chemistry Teacher can be seen in figure 4.5.

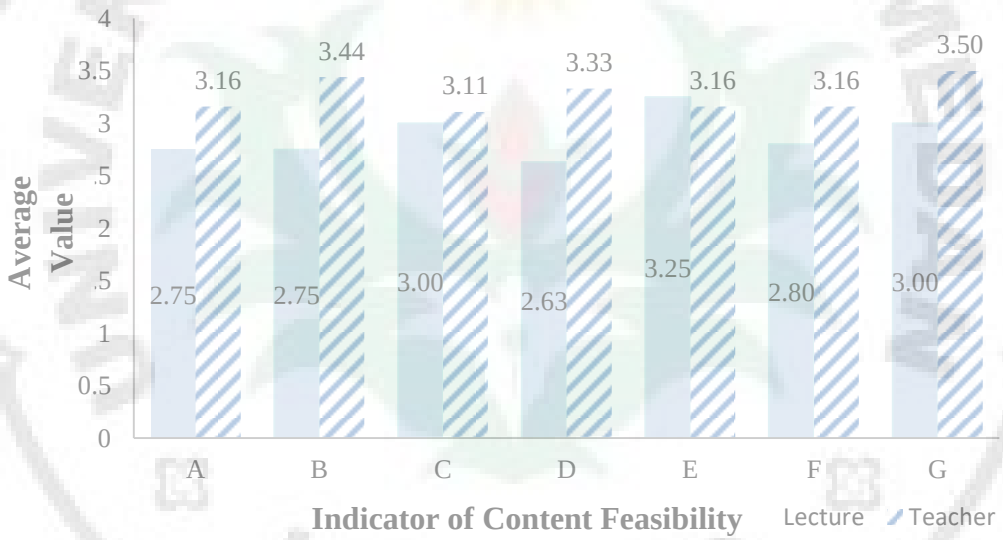

Figure 4.5. The analysis results of integrated teaching materials of PBL model based on aspect of content feasibility

From Figure 4.5 that can be seen in the aspect of content feasibility there are 7 indicators which each assessed by lecturers and teachers as a validator. For lecturer's assessment include: (A) material coverage of 2.75 it means the teaching materials are valid enough and doesn't need revised; (B) The accuracy of the material as much as 2.75 means that the teaching material is valid enough and doesn'tt need to revised; (C) an upgrades aspect of 3.00 shot the teaching material is valid and doesn't need revised; (D) contains productivity insight of 2,63 shot that the teaching material is valid and doesn't need revised; (E) stimulates curiosity of 3.25 means that the teaching material is valid enough and doesn't need revised; (F) develop a life skills of 2.80 means that is valid enough and

doesn’t need revised and (G) develops insight into Indonesiaan and contextual of 3.00 means it is quite valid and doesn’t need revised.

While for the assessment result of teacher include: (A) the material coverage of 3.16 menas the teaching materials are valid and doesn’t need revised; (B) the accuracy of the material of 3.44 means that the teaching material is valid and doesn’t need revised; (C) An Updates aspect of 3.11 means that the teaching material is valid and doesn’t need revised; (D) contains productivity insight of 3.33 show the teaching material valid and doesn’t need revised; (E) stimulates curiosity of 3.16 indicates that the teaching material is valid enough and does'nt need revised; (F) developing life skills of 3.16 means that the teaching materials are valid and doesn’t need revised; and (G) developed indonesian and contextual insight is 3,50 show that the teaching material valid and doesn’t need revised.

Based on the results of lecturer and teacher assessment on integrated teaching materials of PBL model on the content feasibility based on BSNP as a whole has average value 3.09, it's means the teaching material quite valid and doesn’t need revised so it's feasible to be used. The assessment results of teaching materials that developed was higher than the teaching materials A with average value 3.08 and learning materials C with average value 3.00. However, the assessment result of the teaching material that developed was lower than the assessment result of teaching material B which got the average value 3.35 on the content feasibility.

The high of assessment results of teaching materials developed compared to teaching materials A, due to the low assessment of teaching materials A on indicators to develop insight into Indonesian and contextual. In teaching material A materials or examples that presented are not able to open the students' insight to know and preserve the natural resources of Indonesia. While the low of assessment result of teaching materials C compared to the developed teaching material in the indicator of material coverage and contains productivity insight, so that the assessment result of developed teaching materials higher than the teaching materials A and teaching materials C.

The low of assessment results of integrated teaching material of PBL model compared with the assessment result of the teaching material B is the effect of the low assessment result from the lecturer on the material coverage aspect, the accuracy of material and the development of Life Skills. Therefore in the teaching materials need to be improved on some aspects. Such as increasing the breadth and depth of the material, improving the accuracy of the material, and presenting descriptions, examples or exercise that can motivate students in developing life skill according to expert validator's suggestion, so that the teaching material feasible to use.

4.5.1.2 Language Feasibility

The analysis result of integrated teaching materials of PBL model based on language feasibility by Chemistry Lecturer and Chemistry Teacher can be seen in Figure 4.6.

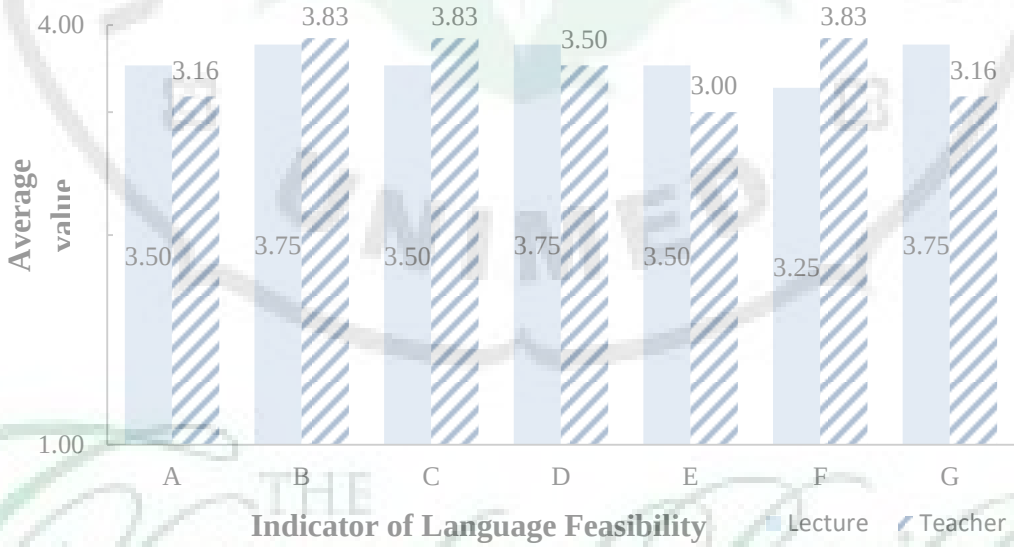

Figure 4.6. The analysis results of teaching materials integrated of PBL model based on aspect of language feasibility

The analysis results of lecturers on chemistry teaching materials integrated PBL model grade X based on the language feasibility aspects are as follows: (A) in accordance with the development of learners is 3.50 shows the material is valid and doesn't need revised; (B) communicative is 3.75 it means the teaching

material is valid and doesn't need revised; (C) dialogical and interactive is 3.50 its means the teaching material is valid and doesn't need revised; (D) The straight is 3.75 it means the teaching material is valid and doesn't need revised; (E) Coherence and coherently mindset is 3.50 it means teaching material valid and doesn't need revised; (F) suitability with the correct Indonesian language is 3.25 it means the teaching material is valid and doesn't need revised; (G) the use of the term and symbol is 3.75 it means teaching material is valid and doesn't need revised.

While for the assessment of teachers include: (A) in accordance with the development of learners is 3.16 it means teaching material is quite valid and doesn't need revised; (B) communicative is 3.83 it meaans the teaching material valid and doesn't need revised; (C) dialogical and interactive is 3.83 it means the teaching material valid and doesn't need revised; (D) The straight is 3.50 it means the teaching material is valid and doesn't need revised; (E) Coherence and coherently mindset is 3.00 it means the teaching material is quite valid and doesn't need to be revised; (F) the suitability with correct Indonesian language rule is 3.83 it means the teaching material is valid and doesn't need revised (G) the use of terms and symbols is 3.16 it means the teaching material is quite valid and doesn't need revised.

Based on analysis results of lecturers and teachers on teaching materials integrated PBL model on the language feasibility aspect based on BSNP as a whole has average value is 3.50 valid and doesn't need revised, so it's feasible to use. The assessment result of language feasibility on the teaching materials that developed higher than the assessment result of the teaching materials used in school with the average value is of 3.00 for teaching material A, average value is 3.33 for teaching material B, and average value is 3.20 for teaching materials C.

The low of assessment results of teaching materials A, B and C on the language feasibility because of the low assessment on some indicators. Some of these indicators are communicative, dialogical and ineractive, and the coherence and coherently of mindset. In teaching material A, the assessment result of the

dialogical and interactive indicators are lower than the assessment results of the developed teaching material.

The use of language that presented in teaching material are less motivate learners to respond the delivered messages and less encourage student critical thinking. In the teaching materials B, the assessment results of indicators in accordance with the development of learners, the developed teaching materials obtained the assessment results higher than the teaching materials B. Whereas in teaching material C the results of assessment on communicative and dialogical and interactive indicators lower than the developed teaching materials.

However the developed teaching materials are valid and does'nt need revised but the teaching materials still need to be improved in some aspects that get the low results on aspects in accordance with the development of learners, the coherence aspect and the coherenty mindset and the use of terms and symbols.

4.5.1.3 Presentation Feasibility

The analysis result of integrated learning materials of PBL model based on aspect of presentation feasibility by Chemistry Lecturer and Chemistry Teacher can be seen in figure 4.7.

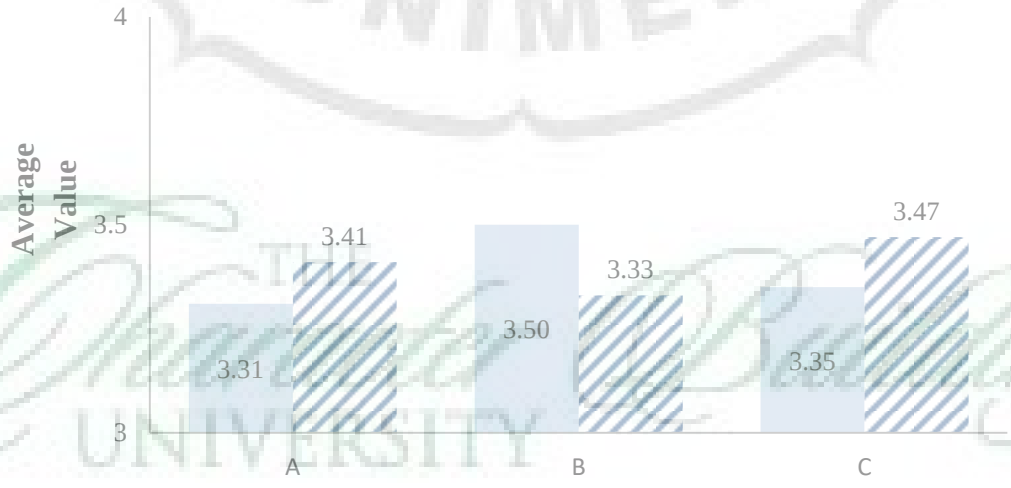

Figure 4.7. The analysis results of integrated teaching materials of PBL model based on aspects of presentation feasibility

In Figure 4.7 can be explained that in aspect of presentation feasibility test there are 3 indicators. The results of lecturers assessment on chemistry teaching materials integrated PBL model grade X based on the aspect of presentation feasibility are: (A) the presentation technique is 3.31 it means the teaching materials is valid and doesn't need revised; (B) presentation of proponent material is 3.50 it means the teaching material is valid and doesn't need revised; (C) learning presentation is 3.35 it means the teaching material is valid and doesn't need revised. whereas the assessment result of teachers include: (A) presentation technique is 3.41 shows the teaching material is valid and doesn't need revised; (B) the presentation of proponent material is 3.33 it means the teaching material is valid and doesn't need revised; (C) the learning presentation is 3.47 it means the teaching material is valid and doesn't need revised.

Based on lecturers and teachers assessment result of integrated learning materials of PBL model on presentation feasibility aspect based on BSNP overall has average value is 3.39 it means developed teaching material is valid and doesn't need revised, so it's feasible to use. The results of assessment feasibility of the teaching materials that developed is higher than the assessment results of teaching materials used in school. The assessment results of each teaching materials used in the school is 3.06 for teaching materials A, 3.33 for teaching materials B, and 3.11 for teaching materials.

The developed teaching materials has fullfil the presentation feasibility based on BSNP. Such as technique presentation that have been presented accurately, for example the presentation of concepts from easy to difficult, from concrete to abstract and from known to unknown. The suitability of the illustrations with the material in the chapter is also presented accurately. Presentation of tables, picture and attachments accompanied by identity. In proponent indicators of material presentation and learning presentation has been presented accurately. This can be seen from the teaching materials that are equipped with glossary attachments, bibliography and answers key. In the learning presentation indicators, developed learning materials that present

centered on the learner and presentation of materials that are dialogical and interactive so that can stimulate students' critical thinking skills.

However the teaching materials that have been develop are valid and doesn't need revised but the teaching materials still need improved as in some aspects based on the advice of lecturers and teachers. Some improvements that must be done on developed teaching materials include the indicators of proponent material presentation such as adding attachments to teaching materials in the form of listing the chemical formulas relating to the material on developed teaching materials.

4.5.1.4 Graphic Feasibility

The analysis result of integrated teaching materials of PBL model based on graphic feasibility aspects by Chemistry Lecturer and Chemistry Teacher can be seen in figure 4.8.

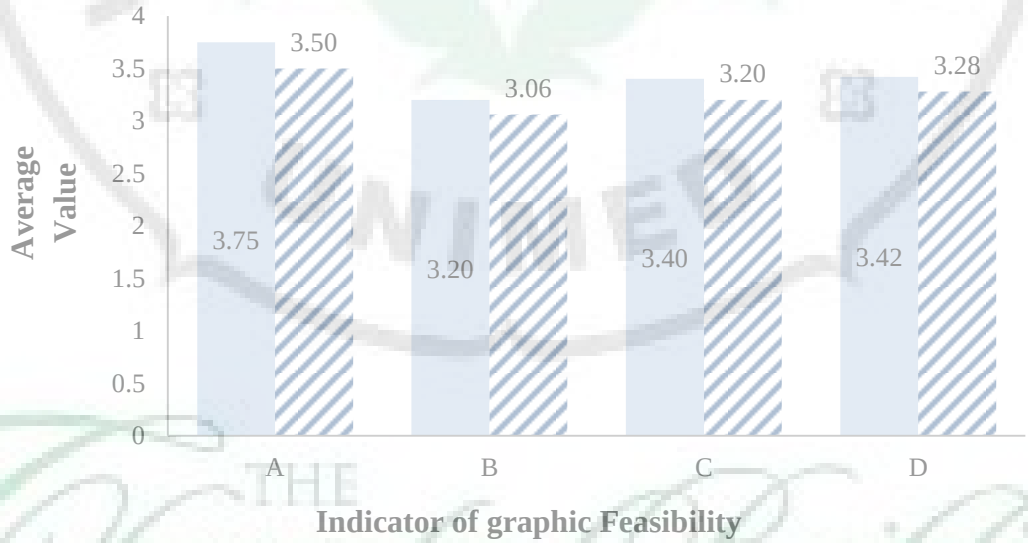

Figure 4.8. The analysis result of integrated teaching material of PBL model based on aspect of graphic feasibility

In Figure 4.8 can be explained that in the aspect of graphic feasibility there are 4 indicators. The lecturer assessment result of integrated teaching materials of PBL model grade X based on the graphic feasibility aspect is as follows: (A) the book size is 3.75 it means the teaching material is valid and doesn't need revised;

(B) the design of the book cover is 3.20 it means the teaching material is valid enough and doesn't need revised; (C) book cover typography is 3.40 shows the teaching material valid and doesn't need revised and (D) the learning presentation is 3.42 it means valid and doesn't need revised.

The assessment of teaching materila by teachers include: (A) book size is 3.50 it means the teaching material is valid and doesn't need revised; (B) The design of book cover is 3.06 shows the teaching material is quite valid and doesn't need revised; (C) typography of the cover is 3.28 it means the teaching material is valid and doesn't need revised and (D) the learning presentation is 3.28 that shows the teaching material is valid and doesn't need revised.

Based on the lecturers and teachers result assessment of integrated teaching material of PBL model on the aspect of graphic feasibility based on BSNP over all has average value 3.41. It means valid and doesn't need revised so the teaching materila is feasible to use. The assessment result of graphic feasibility on developed teaching materials is higher than the assessment result of teaching materials that used in school. The assessment results of each teaching materials which used in the school is 3.05 for teaching materials A, 3.37 for teaching materials B, and 3.05 for teaching materials C. The teaching materials that have been developed have a higher assessment results than the teaching materials used in school. It can be seen in the attachment of teaching materials that used in schools are not presented like a answer key. In addition, the choice of book colour that are less interesting causes the assessment results of teaching materials used in schools are low.

4.5.1.5 The Presentation Feasibility Based on Syntax PBL Model

The analysis result of integrated teaching materials of PBL model based on the feasibility of presentation based on syntax PBL model by Chemistry Lecturer and Chemistry Teacher can be seen in Figur 4.9

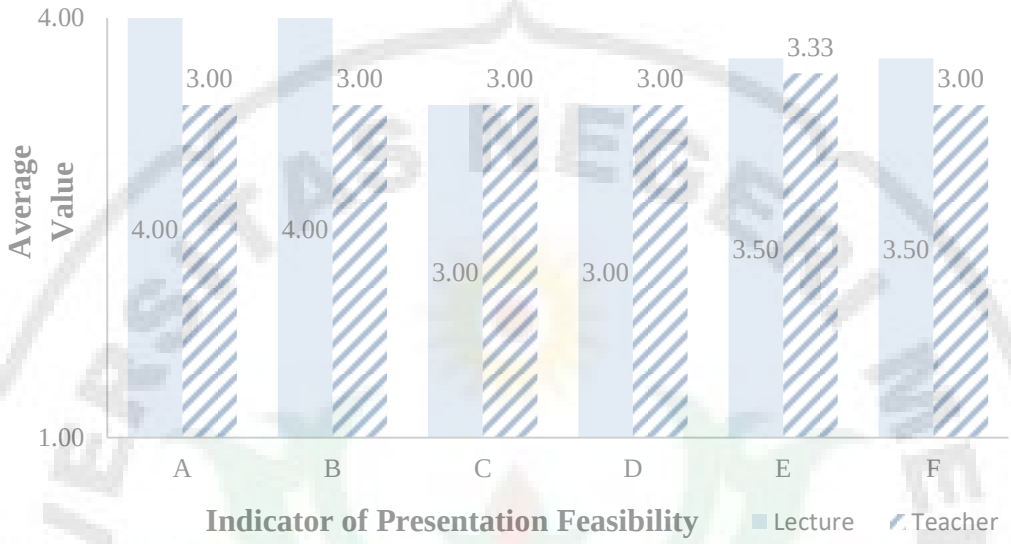

Figure 4.9. The analysis results of integrated teaching materials of PBL model based on the presentation feasibility based on PBL model syntax

In Figure 4.9 can be explained, the aspect of presentation feasibility there are 6 indicators. The assessment results of lecturer of integrated teaching material of PBL model grade X based on the aspect of feasibility presentation based on PBL model syntax are as follows: (A) suitability with the presentation of PBL learning model is 4 it means the teaching material is valid and doesn't need revised; (B) average value of student-centered is 4 shows the teaching materials is valid and doesn't need revised; (C) the involvement of students get average value as much as 3 it means the teaching material is quite valid and doesn't need revised; (D) the ability to stimulate students' depth of thinking is 3 it means the teaching material is quite valid and doesn't need revised; (E) the ability to generate feedback for self-evaluation is 3.5 it shows the teaching material valid and doesn't need revised and (F) curiosity is 3.5 it means the teaching material valid and doesn't need revised.

Whereas for the assessment of teachers include: (A) suitability with the presentation of PBL learning model is 3.0 it means teaching material is qute valid and doesn't need revised; (B) average value of student-centered is 3. shows teaching materials is quite valid and doesn't need revised; (C) the involvement of students get average value as much as 3 it means the teaching material is quite

valid and doesn't need revised; ; (D) the ability to stimulate students' depth of thinking is 3 it means the teaching material is quite valid and doesn't need revised; (E) the ability to generate feedback for self-evaluation is 3.3 it shows the teaching material valid and doesn't need revised and (F) curiosity is 3.3 it means the teaching material valid and doesn't need revised.

Based on the assessment results of lecturers and teachers of integrated learning materials PBL model on aspects of PBL model overall has average value is 3.27 it means valid and doesn't need revised so feasible to use. However, the assessment result of the aspect of feasibility based on PBL model syntax is not comparable to the teaching materials that used in the school because the feasibility aspect of PBL-based syntactic feasibility is only found in the developed teaching materials. So there is no assessment of the presentation aspect based on the PBL model so it can not be compared.

Although the teaching materials that have been developed are valid and doesn't need revised but still doing improvements related to the presentation of PBL-based syntax. The improvement can be done by presenting materials that can stimulate the depth of thinking of learners through illustrations and examples question accordance with the advice of expert validators.

4.5.2 Students Assessment of Teaching Materials

Giving questionnaire of student responses of integrated teaching materials PBL model aims to get student responses of teaching materials that have been develop. The assessment aspects of teaching materials by students are the aspect of the display, material aspects and aspects of the benefits of developed teaching materials. The results of the assessment of teaching materials by students, are as follows:

4.5.2.1 Student Assessment of The Display of Teaching Material

Student assessment on teaching materials based on the display aspect of teaching materials by students with high learning outcomes and students with low learning outcomes can be seen in Figure 4.10.

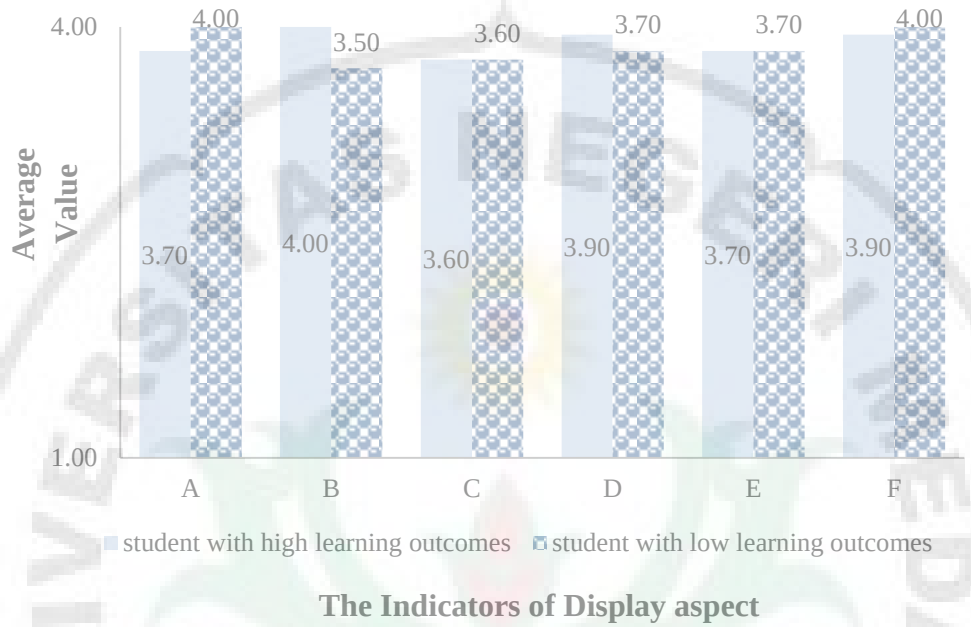

Figure 4.10. The assessment result of integrated teaching learning of PBL model based on display aspect

In Figure 4.10 it can be seen in the aspect of display there are 6 indicators. The result of the students' assessment on the chemistry integrated teaching materials of PBL model grade X based on the aspect of display of teaching materials is as follows: The assessment results of aspects (A) text or writing on teaching materials easy to read both students with high learning outcomes and students with low learning outcomes say that teaching material valid and doesn't need revised. The Results of student assessment with low learning outcomes are higher than students with high learning outcomes. So it can be concluded that students with low learning outcomes tend to better understand the subject matter through written text. The assessment results of the indicator (B) The picture that presented clearly, both students with high learning outcomes and students with low learning outcomes shows the teaching material is valid and doesn't need revised. The assessment results of students with high learning outcomes are higher than students with low learning outcomes. So it can be concluded that students with high learning outcomes more easily to understand the material through the picture (visual).

The assessment result of indicator (C) the image presented is proportional, both students with high learning outcomes and students with low learning outcomes stated teaching materials are valid and doesn't need revised. While on the assessment results of students with high learning outcomes and students with low learning outcomes of the indicator (D) each picture is presented according to description, valid and does not need to be revised. The assessment results of students with high learning outcomes are higher than students with low learning outcomes. So it can be seen students with high learning outcomes is more like and understand to the lessons through the images present on teaching materials.

The assessment results of the indicator (E) the images presented is attractive, both students with high learning outcomes and students with low learning outcomes stated teaching materials are valid and doesn't need revised. Whereas in the assessment results of indicator (F) the images presented is accordance with subject matter, both of students state the teaching material is valid and does'nt need revised. The assessment results of student with low learning outcomes are higher than students with high learning outcomes. So it can be concluded that students with low learning outcomes are also included in the type of students with visual learning abilities through the images presented in the teaching material.

In the assessment result of the teaching materials with of the display aspect on the developed learning materials obtained average value is 3.8 for students with high learning outcomes and 3.75 for students with low learning outcomes. The data show that the developed teaching material is valid and doesn't need to be revised so it is feasible to use.

4.5.2.2 Student Assessment of Material of Teaching Material

The assessment of teaching materials based on the material aspects by students with high learning outcomes and students with low learning outcomes can be seen in Figure 4.11.

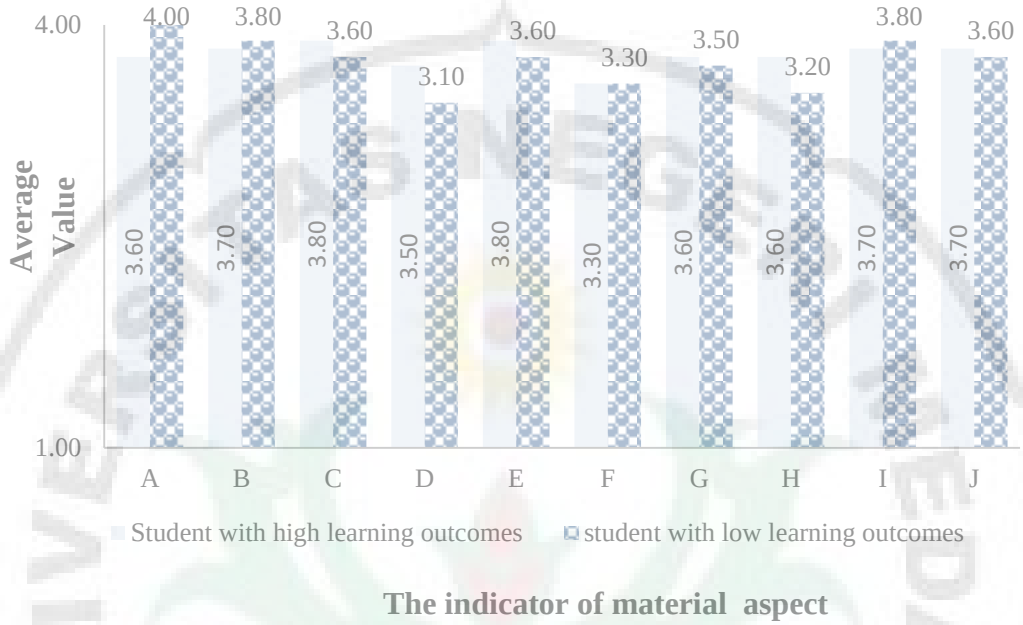

Figure 4.11. The assessment results of integrated teaching materials of PBL models are based on material aspects

In Figure 4.11 it can be seen that in the display aspect, there are 10 indicators. the assessment result of indicators (A) the concept is explained by using illustrations of daily life, both of students with high learning outcomes and students with low learning outcomes show that the developed subject material is valid and doesn't need revised. the assessment results of students with low learning outcomes are higher than the results of the assessment of students with high learning outcomes. So it can be concluded that students with low learning outcomes prefer to learn with facts or daily event. The assessment results of teaching materials of indicators (B) teaching materials using examples of problems related to daily life, both of students with high learning outcomes and students with low learning results stated teaching material is valid and doesn't need revised.

Furthermore, the assessment result of the students' with the high learning outcomes and the students with the low learning outcomes related indicator (C) the suitable of the sample matter with the material show the teaching material is valid and doesn't need revised. The assessment results related indicators (D) the material presented encourages students to discuss, both of students with learning

outcomes and students with low learning outcomes show the teaching material valid and doesn't need revised. The assessment results of students with high learning outcomes are higher than students with low learning outcomes. So it can be concluded that students with high learning outcomes are students who like learning by discussing through the problems faced with teaching materials and the assessment results also show that students with high learning outcomes are students active in learning. For the assessment results of indicators (E) the suitability of the material both of students with high learning outcomes and students with low learning outcomes stated that teaching material valid teaching doesn't need revised.

The assessment results of the indicator (F) students' understanding of the material, students with high learning outcomes and students with low learning outcomes show the teaching materials is valid and doesn't need revised. The assessment results of the indicator (G) clarity of the sentence use, students with high learning outcomes and students with low learning outcomes stated the teaching material valid and doesn't need revised. The assessment results of students with high learning outcomes and students with low learning outcomes on the indicator (H) the suitability of the use of terms is valid and doesn't need revised. On the indicator H, the assessment Results of student with higher learning outcomes is higher than students with low learning outcomes. So that it can be concluded that students with high learning outcomes are easier to understand the lessons through with the terms that used in teaching materials

In addition to the assessment results of indicators (I) final summary of the material, both students with high learning outcomes and students with low learning results stated the teaching material is valid and doesn't need revised. In the assessment result of indicators (J) questions as a media for evaluating material, both students with high learning outcomes and students with low learning outcomes show the teaching materials valid and doesn't need revised.

In the assessment result of the teaching materials with the aspect of material of the developed learning materials, obtained the average value is 3.63 from students with high learning outcomes and 3.55 from students with low

learning outcomes. The data show the developed teaching material is valid and doesn't need revised so it is feasible to use. Based on the data can be seen that students with high learning outcomes and low learning outcomes have a good response to the material presented on the developed teaching material.

4.5.2.3. Student Assessment Results of Benefit Aspects of Teaching Material

Students' assessment of teaching materials based on aspects of the benefits of teaching materials by students with high learning outcomes and students with low learning outcomes can be seen in Figure 4.12.

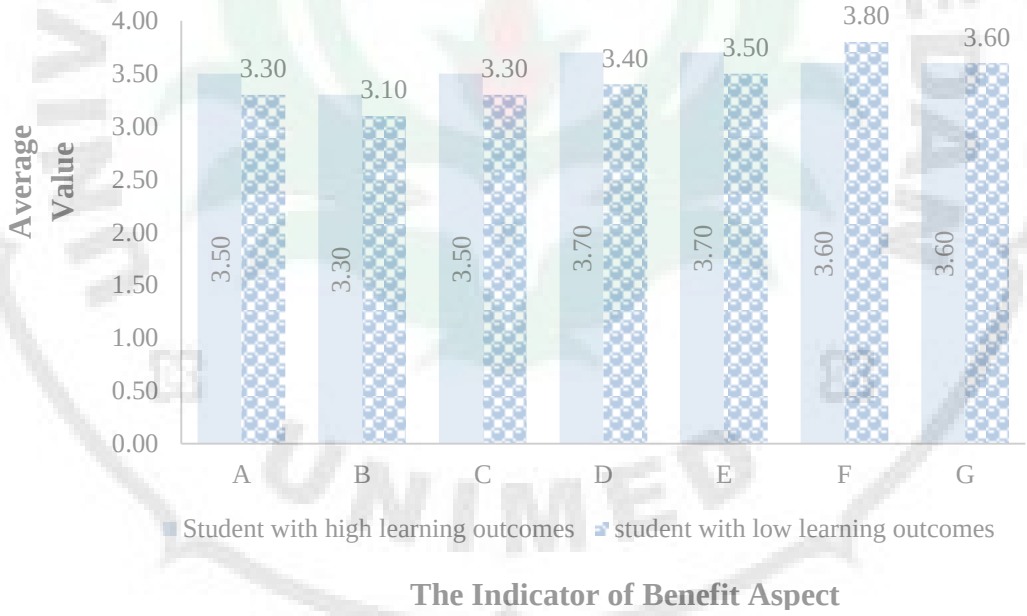

Figure 4.12. The assessment results of integrated learning materials of PBL model based on benefit aspects

In Figure 4.12 can be seen that in the aspect of the benefits of teaching materials there are 7 indicators. The assessment results of indicator (A) teaching materials make the students easier in understanding the subject material, both of students with high learning outcomes and students with low learning outcomes stated the teaching material valid and doesn't need revised. However, the assessment result of students' with the higher learning outcomes on the indicator A is higher than the students with low learning outcomes. This means that students with high learning outcomes more easily understand the material with

developed teaching materials. The assessment result of indicator (B) teaching materials making students more courageous in expressing opinion, both of students with high learning outcomes and students with low learning outcomes state the teaching materials are quite valid and doesn't need revised. The assessment results of students with high learning outcomes are higher than students with low learning outcomes. So it can be concluded that students with high learning outcomes have higher critical thinking skills so dare to express opinions through the problems presented on teaching materials.

On the assessment result of indicator (C) teaching materials make students more active, both of students with high learning outcomes and students with low learning outcomes show that the developed teaching material valid and doesn't need revised. The assessment result of student with higher learning outcomes is higher than students with low learning outcomes. So it can be concluded that students with high learning outcomes tend to like challenge to solve the problems that present on teaching materials. In addition, students with high learning outcomes tend to like the learning process in groups. Whereas students with low learning outcomes tend to be passive students. For the assessment results of indicators (D) teaching materials motivate students to think critically shows that teaching material is valid and doesn't need revised. the result of student assessment with higher learning outcomes is higher than students with low learning outcomes. This means students with high learning outcomes have higher critical thinking power than students with low learning outcomes. Furthermore, the assessment results of indicators (E) teaching materials teaching materials make students active for self-learning, both of students with high learning outcomes and students with low learning outcomes show the teaching material valid and doesn't need. The assessment results of students with high learning outcomes are higher than students with low learning outcomes. So that shows that students with low learning outcomes tend to be passive students. The assessment results students of the developed teaching materials the indicator (F) student interest in teaching materials is valid and doesn't revised. But the assessment results of students with low learning outcomes are higher than students with high

learning outcomes. Assessment results show that students with low learning outcomes are more interested in teaching materials developed than students with high learning outcomes. In the assessment result related to the indicator (G) the teaching materials make the students challenged to learn it, both of students with high learning outcomes and students with low learning outcomes show valid and doesn't need revised.

The average calculation of the assessment results of student is 3.66 for students with high learning outcomes and 3.57 for students with low learning outcomes. The average value shows the teaching material is valid and does'nt need to be revised and feasible to use. The results of the assessment also shows that students have a good response to the developed teaching materials.

In addition, Based on the assessment results it can be concluded that students with high learning outcomes are more interested in using integrated teaching materials PBL model and also more suitable to use teaching materials integrated PBL model. This can be seen in the high assessment results of the developed teaching material by students with high learning outcomes. From all indicators assessed on teaching materials, 9 indicators get high assessment results from students with high learning outcomes and 4 indicators get high assessment result from students with low learning outcomes.