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Proceedings

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Theme : Education Innovation in Indonesia Context Focused on Disruptive Technology of Industrial Revolution 4.0.

23 - 24 September 2019
Garuda Plaza Hotel - Jln. Sisingamangaraja No. 18
Medan, North Sumatra - Indonesia

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Rundown of The 4th Annual Internatioanal Seminar on Transformative Education and Educational Leadership (AISTEEL) 2019
Garuda Plaza Hotel, Medan, 23 – 24 September 2019

1st day (Monday, September 23, 2019)

Time	Activities	PIC
15.00 – 20.00	Registration in Garuda Plaza Hotel	committee

2nd day (Tuesday, September 24, 2019)

Time	Activities	PIC/Moderator
07.00 – 08.30	Poster Sessions 1	Section Poster 1
08.30 - 09.00	**Opening Ceremony** 1. MC Speech 2. Traditional Welcome Dance 3. Indonesian National Anthem 4. Pray 5. Chairperson Report 6. **MoU signing between Unimed and PSU - Thailand** 7. Welcoming speech of Director of Postgraduate School 8. Welcoming speech and official opening of Rector of State University of Medan	MC
09.00 – 09.40	Plenary Lecture 1: **Prof. Dr. Syawal Gultom, M.Pd** (State University of Medan– Indonesia)	Moderator Section
09.40 – 10.25	Plenari Lecture 2 **Prof. W. L. Quint Oga-Baldwin** (Department of Education, Faculty of education and Integrated Art and Sciences, Waseda University - Japan)	Prof. Amrin Saragih, PhD (Panel)
10.30 – 11.15	Plenari Lecture 3 **Prof. Dr. Wu-Yuin Hwang**(Graduate Institute of Network Learning Technology National Central University, NCU - Taiwan)	
11.15 – 12.00	Plenari Lecture 4 **Prof. Dr. Ekkarin Sungtong** (Dean of Faculty of Education Prince of Songkla University - Thailand)	Mangara Simanjorang, PhD (Panel)
12.00 – 12.45	Plenari Lecture 5 **Asst. Prof. Patcharin Panjaburee, Ph.D.(**Mahidol University – Thailand)	
12.45 – 13.30	**Lunch Break/** Poster Sessions 2	Section Poster 2
13.30 – 15.30	**Parallel Session 1**	
15.30 – 16.00	Break/ Poster Sessions 3	Section Poster 3

15.50 – 18.00	**Parallel Session 2**	Moderator/Operator
18.00 – 19.00	Break/ Prayer	
19.00 – End	Banquet (Gala Dinner) - Announce of Best Presenter - Announce of Best Poster	Consumption Section

Proceedings of the 4th Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2019)

Preface

The 4th Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2019) was held in Garuda Plaza Hotel, Medan City-Indonesia on 23-24 September 2019. This seminar is organized by Postgraduate School, Univesitas Negeri Medan and become a routine agenda at Postgraduate program of Unimed now.

The AISTEEL is realized this year with various presenters, lecturers, researchers and students from universities both in and out of Indonesia participating in, the seminar with theme "Education, Learning and Leadership Innovation."
The plenary speakers coming from various provinces in Indonesia have been present topics covering multi disciplines. They have contributed many inspiring inputs on current trending educational research topics all over the world. The expectation is that all potential lecturers and students have shared their research findings for improving their teaching process and quality, and leadership.

The fourth AISTEEL presents a keynote speaker and 4 distinguished invited speakers from Indonesia, Japan, Taiwan, and Thailand. In addition, presenters come from various Government and Private Universities, Institutions, Academy, and Schools. Some of them are those who have sat and will sit in the oral defence examination.

There are 310 articles submitted to committee, some of which are presented orally in parallel sessions, and others are presented through posters. The articles have been reviewed by double blind reviewer and 172 of them were accepted for published by Atlantis Press indexed by International Indexation and 96 papers are published by digital library indexed by google scholar.
The Committees of AISTEEL invest great efforts in reviewing the papers submitted to the conference and organizing the sessions to enable the participants to gain maximum benefit.

Grateful thanks to all of members of The 4th Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2019) for their outstanding contributions. Thanks also given to publisher for producing this volume.

The Editors

Bornok Sinaga
Rahmad Husein
Juniastel Rajagukguk

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The Development of Chemistry Lab Guide Book for High School Based on Guided Inquiry to Measure Scientific Attitudes and Science Process Skill

Gorat Victor Sibuea
Magister of Chemistry Education Postgraduate, State Univesity of Medan
Medan, Indonesia
goratsibuea@yahoo.com

Retno Dwi Suyanti
Departement of Chemistry Education
State University of Medan
Medan, Indonesia
dwi_hanna@yahoo.com

Saronom Silaban
Departement of Chemistry Education
State University of Medan Medan, Indonesia
silabans@gmail.com

***Abstract* - Education is the process of gaining knowledge, skills and values both as individuals and socially, for the benefit of community life. Science as part of education aside from being a collection of knowledge (a body of knowledge), should also be related to ways of thinking. Students understanding of chemical concepts is very much related to process skills. Lack of student understanding of chemistry is inseparable from learning that is dominated by the delivery of information from the teacher to students, so students tend to memorize and lack students process skills. This Study aims to analyze teaching mataerial development in the form of a Chemistry practicum book use Quided inquiry Practicum for High School Grade XI to Measure Scientific Attitudes and Sains Process skills. Research method using Development Research by Stages Analysis, Design, Development, Implementation and Evaluation (ADDIE).The Search instrument are Questionnaire and objective test. The Feasibility of using Chemistry practium book is analyzed based on the standart data of content, apperance, materials and to Measure Scientific Attitudes and Science Process Skills. Data were obtained by using validation sheets that have been validated by team of expert. The Fisrt step in development is the analysis of teaching materials available in Senior High School Teladan Medan (SMA Swasta Teladan Medan).The result of using Chemistry Practicum book uisng Quided inquiry method is the correlation of students who use inquiry-based pratikum guides to increase scientific attitudes and science process skills in learning but stiil needs to be revised and developed.**

Keywords— Development, Chemistry Pratical Quided Book,Skill,Quided Inquiry

I. INTRODUCTION

Science is a method of natural investigation, a way to find out nature and scientific discoveries can be trusted. In other words, science is a method for finding trustworthy knowledge. Margins, column widths, line spacing, and type styles are built-in; examples of the type styles are provided throughout this Chemistry learning is not enough to cover only cognitive aspects, but aspects of the affective (scientific attitude) and psychomotor aspects [1]. Chemistry learning guides active students in scientific processes based on facts so that students can gain a deeper understanding of nature around One of the characteristics of chemistry learning is practicum activities carried out in the laboratory or outside the laboratory. Students' understanding can be increased by conducting practicum to prove a theory and concept. A chemistry education institution in the United States recommends thirty percent of chemistry learning time to be emphasized on practicum activities [2].

Many studies on media and methods in learning Chemistry have been carried out. However, the results of observations in the field show that chemistry teachers still find it difficult to teach chemistry, especially in teaching practicum in the laboratory. Many teachers are still found who only teach theories without doing the practicum practicum should be done based on syllabus. As a result students only remember and hoard a variety of information without being required to understand information and apply information without being required to understand information and apply that information in daily life. This results when children leave school, they are only theoretically smart but very poor application [3]. Practicum is a special feature of chemistry learning, so practicum cannot be separated from chemistry learning to gain laboratory experience, science process skills, and experience for investigation. [4] (Sudjana.2011).

Practicum activities are part of the macro-chemical representation so that it becomes an important part in chemistry learning. Practicum is a hallmark in learning science and supports student activity in learning [5], [6. According to Hofstein & Lunetta (2004) , practicum activities facilitate students to build logical thinking, inquiry abilities, and psychomotor abilities. Laboratory activities also have great potential in increasing skills related to communication and cooperation. Chemistry education study program, formulating the leveling of laboratory skills for students in 3 levels, namely: knowing and being able to operate glassware in chemical laboratories properly and safely, conducting chemical preparation and separation and able to carry out chemical analysis and synthesis activities. The existence of this gap is expected to be able to foster creativity and science

skills in chemistry education students to formulate and arrange chemistry learning in secondary schools (KA Rahman, et al, 2016).

Practicum activities are very important in chemistry learning because chemistry is an experimental science that cannot be learned only through reading, writing, and listening alone. Studying chemistry must be in the form of products and processes so that it becomes a means of achieving scientific learning orientation (Meli Siska, Kurnia & Sunarya, 2013). Learning in the laboratory can also affect student learning achievement when compared with conventional learning and learning methods in the classroom. Based on observations made by researchers, in addition to lack of facilities, at the time of practicum implementation many students do not understand work procedures so practicums are less able to takes place well. It is often caused because of a lack of understanding of the material related to the practicum as well as an understanding of the equipment and chemicals that will be used before starting the practicum. . Many teachers are still found who only teach theory without practicing what they should practicum should be done based on syllabus. As a result students only remember and hoard a variety of information without being required to understand information and apply information without being required to understand information and apply that information in daily life. This results when children leave school, they are only smart theoretical but very poor application (Brickman, 2009).

Learning with practicum conducted in the Laboratory can make students more active in learning, because students get the opportunity to directly see, observe, and do so that students will be easier to remember permanently and can tie students' interests and abilities to aspects cognitive, affective, and psychomotor in achieving practicum goals (Mamlok & Barnea, 2012; Situmorang & Situmorang, 2014). Practicum activities will be more meaningful if given the opportunity to play more roles in the practicum, not only doing practicum but also applying scientific methods such as formulating problems, proposing hypotheses, determining variables, designing and doing practicum, analyzing data obtained from practicum, and drawing conclusions in order discover concepts independently (Nurhayati, 2015).

The Result of study show that Practical activities can provide opportunities for children to practice reasoning, rational thinking skills, apply attitudes and scientific methods to find the truth than they learn (Hoftein, 2004; Jahro, 2009; Kurniati, 2011).The ability to do practical work and student interest in chemistry lessons. Laboratory activities are carried out through practicum methods, methods that involve students directly by conducting themselves, following a process, observing an object, analyzing, proving and drawing their own conclusions. Demircioğlu & Yadigoroğlu (2011) suggest that practicum methods are more effective in gaining student understanding because they have a lot of practice in measuring, interpreting, drawing conclusions and making generalizations. Azar (2016) in his research shows that by giving opportunities to students to experiment give an influence very large in the learning process.

Practicum has an important role in the process of learning Chemistry. For effective chemistry learning, the chemistry learning material must be supported by application in Laboratorium ((Kurbanoğlu & Akim, 2010). The purpose of learning in the Laboratory can be to increase understanding of the material being studied, problem solving skills, the ability of the science process and understanding of natural science. Students are expected to be able to connect between theory and practice in the laboratory. Sibiriou and Bogner (2015) state that in order to solve scientific problems, students must be able to act as a researcher and follow the scientific process. students determine the problem, look for and develop alternative solutions and solutions to the problem, find information, evaluate and communicate it (Katsampoxaki-Hodgetts, Fouskaki, Siakavara, Moschochoritou, & Chaniotakis, 2015).

Isnaeni (2014), researching the Development of Guided Inquiry Based Practicum Guidelines for Optimizing Hands On Semester II Students in Physics Education Study Program, obtained the development of guided inquiry based practicum manuals to optimize student hands on is done through stages referring to the model of org & Gall. Guided inquiry based practicum manuals to optimize student hands on developed in this study according to material experts, educators, and peers categorized as "good" and appropriate to be used as learning media. Students respond by using guided inquiry based practicum manuals to optimize hands on students is "worthy".

Guided inquiry based practicum manuals to optimize student hands on developed in this study according to material experts, educators, and peers categorized as "good" and appropriate to be used as learning media. Students respond by using guided inquiry based practicum manuals to optimize hands on students is "worthy". Based on the results of the analysis and observations conducted by researchers, it is necesery further researched that the guided inquiry-based natural science teaching guides are in a very valid category and can already be used by teachers and students in practicum activities and can improve learning outcomes in the cognitive domain (Lena Putri (2014).The assessment of aspects of knowledge is done through written tests, oral tests, and assignments according to the competencies being assessed. Skills assessment is carried out through practices, products, projects, portfolios, and / or other techniques according to the competencies being assessed. (Ministry of National Education, 2004). The development of this learning tool is important to contribute to improving the effectiveness of learning chemistry, especially in chemistry. The learning tool developed is expected to be a model or example for teachers and can provide stimulation for teacher creativity to develop other learning tools that can be used in the learning process. The use of learning models that do not cause learning outcomes do not match what is expected and are less motivating for students. Learning models that have the highest effect on effectiveness for students one of them is inquiry learning model Inquiry learning is a learning model which encourages students to be able to solve problems with investigative activities and increase skills and knowledge freely (Trna, Trnova & Sibor, 2012). The main purpose of

guided inquiry learning is to help students to develop intellect, discipline and the ability to think to solve problems and to answer the root of the problem. (Sanjaya, 2006). Leonard & Nwanekezi (2018) have conducted experiments or experiments to teach Acid Bases material by using guided inquiry methods using the THAM (Task Hiersrchy Analysis Model (THAM). . In the Minister of National Education Regulation No. 22/2006 concerning content standards it is emphasized that chemistry, including the coverage of a group of science and technology subjects, is intended to acquire advanced competencies in science and technology and to cultivate scientific thinking skills critically, creatively and independently. (RE Permatasari, L Yuanita, 2014).

Based on the result of the research that has been done,there is the influence of the use the Chemistry lab guide book for High school Based on Guided Inquiry to measure Scientific attitudes and Science Process Skill on the learning outcome of high school students in chemistry subjeck matter (Sembiring,RH,2013).The Use the Chemistry lab guide book for High school based on Guided Inquiry can run well and correctly if : (1) the optimum practicum at school due to lack of availability of practicum quides,(2)tool an material for condunting laboratory work in laboratories.(3)the students understanding of chemicals materials to the lack of scientific process skills.(4) to implements for the guided Inquiry based practical guide books on scientific attitudes and science process skills. and (5)to improve the scientific attitude of students.

II. METHODS

This research is a development of The Chemistry Lab Guide book for High School base on Guided Inquiry to measure scientific attitude and science process skills. Media development by guided practicum using ADDIE (Analysis, Design, Developmnet, Implementation and Evaluation) steps. these steps include ; (1) Analysis (analyzing the need for news development, analyzing the feasibility and requirements of development, analyzing the feasibility and requirements of developing the guided practicum(2) Design(designing an preparing initial product design),(3) Developmnet (realizing product design), (4) Implementation use Learning Methods that has been developed in real situations in the classroom, (5) Evaluation (measuring the final competence of instructional media).The research instruments used to collect data are questionnaires and objective test. Stages of development of the guided practicum to measure scientific attitude and science prosess skill is illustrated in figure 1.

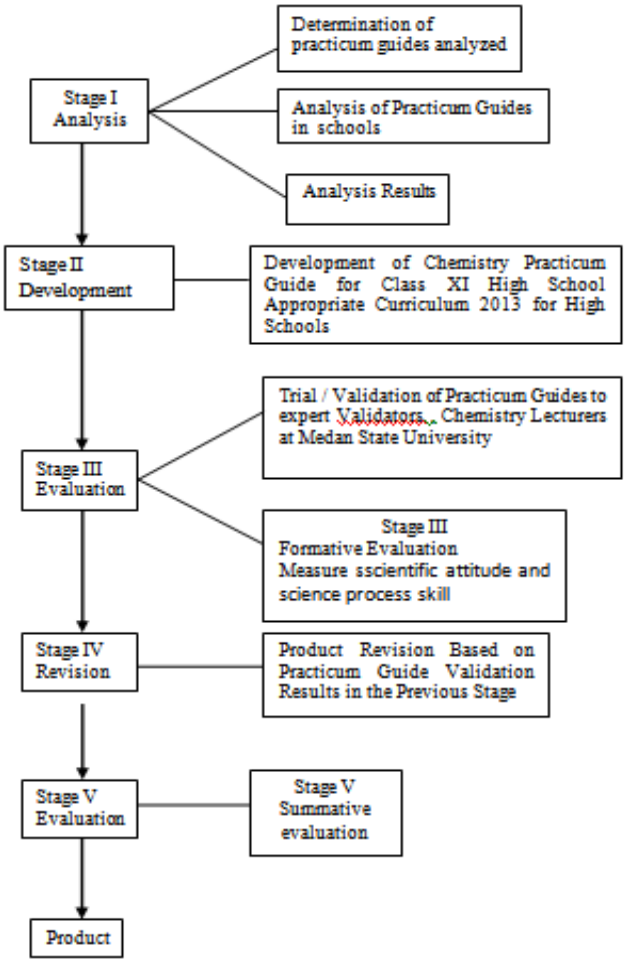

Fig 1. Stages of development of guide practicum base on guided Inquiry to measure scientific attitude and science process skills.

III. RESULT

Implementation of ADDIE model in designing and developing the Chemistry lab guide book for High School based on Guided Inquiry to create an effective and efficient classroom learning and measure scientific attitude and science process skill. The steps in applying this development of The Chemistry Lab Guide book for High School, first before conducting the research, the researcher first analyzes the researcher who has use in the school, and the researcher modifies the guidebook use in the school. Practical guide analysis is done by providing an assessment in the form of scores which include material coverage, systematic evaluation, containing insight into productivity, stimulating curiosity, developing life skills, design and language. Where scores range from 1-5. The results of the practicum guide analysis based on the 2013 curriculum which includes aspects of practical material coverage, systematic presentation, containing productivity insights, stimulating curiosity, developing life skills, design and language.

Research on the development of chemistry lab guide for high school / MA Innovative class XI Chemistry material

based on the 2013 curriculum is Research and development (R&D) and experimentation. The results of the study consisted of the development of a chemistry practicum guide book for high school grade XI which was carried out through the preparation of a 2013 curriculum standard experiment based on the syntax of guided Inquiry learning.

The next stage is the evaluation stage. At this stage the practicum guide that has been developed is validated using a questionnaire BSNP (National Education Standards Agency) by chemistry lecturer at Medan State University (UNIMED) and chemistry teacher who has taught in high school. The assessment of practicum guides is obtained based on respondents' responses to the draft guiding practicum results of the development by asking respondents for opinions based on the assessment criteria very well (score 5), good (score 4), sufficient (score 3), poor (score 2) and not good (score 1). Components assessed include pre-legal coverage, systemic presentation, containing productivity insights, stimulating curiosity, developing Scientific Attitudes, Science Process Skills and language. The next stage is the revision stage. Validated practicum guides, corrected. Improvements to the lab guide based on the advice and input of lecturers and teachers as expert validators. The researchers pay attention to several things, namely (1) suggestions given by lecturers and chemistry teachers regarding what Chemistry material should be practiced / tried out (2) developing practicum guides refer to chemistry books and practical guide books that already exist, both from textbooks and those sourced / downloaded from the internet and (3) advice from supervisors.

The last stage is the summative evaluation stage. The revised practicum guides were reproduced to be tested on students, where the trials carried out were limited trials to see the effectiveness of the practicum guides that had been developed as a whole. The final product resulting from this research is The Chemistry Lab Guide book for High School to measure scientific attitude and science process skills

Practical Guidance Indicator		PublisherX	Practicum Guidance that has been developed
Practicum Coverage			
a.	Extent of Practicum	√	√
b.	Practicum conformity with KI and KD	-	√
c	Conformity of practicum objectives with learning indicators	-	√
d.	The suitability of practicum procedures with the learning model applied	√	√
Presentation Systematic			
a.	The composition of the Presentation Arrangement	√	√
b	Identity of tables, figures and attachments	√	√
c	Practical procedures are explained systematically and clearly	-	√
Contains Productivity Insights			
a	Cultivating a student work ethic	-	√
b	Growing enthusiasm and process skills in science process skills in students	-	√
Stimulate curiosity			
a.	Cultivating a student work ethic	-	√
b	Growing enthusiasm for innovation, creative and critical thinking in students	-	√
Develop scientific attitude skills			
a.	Develop scientific attitude skills	√	√
b	Develop students' psychomotor abilities	√	√
c	Develop academic skills	-	√
The design			
a.	Presentation of pictures, tables and symbols	-	√
b	Interactive	-	√
Language			
a.	In accordance with the development of students / students	√	√
b	Communicative	√	√
c.	Consistency of use of terms and symbols in practicum guides	-	√

Coverage Aspect of Practicum Materials

The results of an innovative practical guide analysis on high school class XI base on the scope of the material consisting of the extent of the practicum, the suitability of the practicum with KI and KD, the suitability of the practicum objectives with the applied learning model can be seen from the graph in Figure 4.1 below

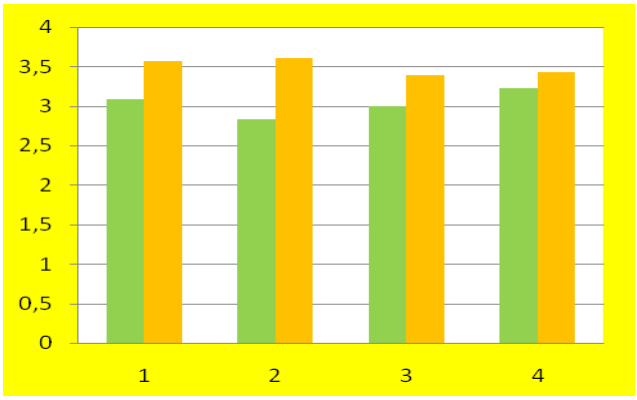

Fig. 2. The results f the Chemistry lab guide are based onMaterial Coverage Aspects

Systematic Aspects of Presentation

The results of the analysis of The Chemistry Lab Guide book for High School base on Guided Inquiry to measure scientific attitude and science process skills that have been developed on materials of Class XI high schools based on aspects of the presentation system that consist can be seen from the graph in Figure 4.2 below

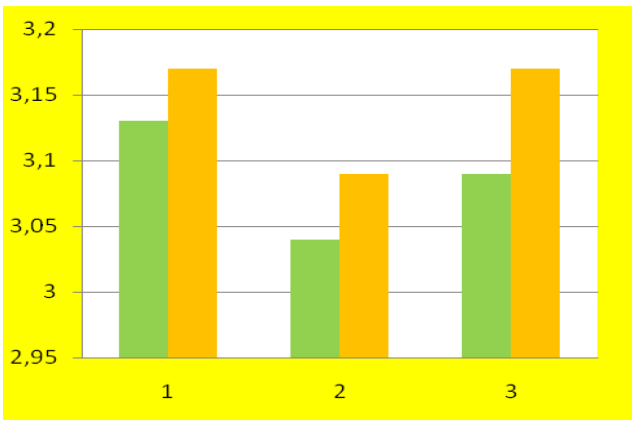

Fig. 3. Results of Chemistry lab guide analysis based on the systematic aspects of the presentation

Aspects of Containing Productivity Insights

The results of the analysis of innovative The Chemistry Lab Guide book for High School base on Guided Inquiry to measure scientific attitude and science process skills that have been developed material of Class XI High Schools based on the Containing Aspect of Productivity comprising can be seen from the graph in Figure 4.3 below

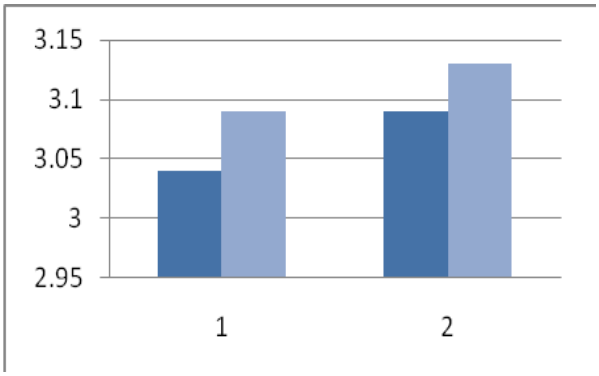

Fig. 4. Results of Chemistry lab guide analysis based on the Aspect of Productivity insight

Stimulating Aspects of Curiosity

The results of the analysis of innovative practical guides that have been developed

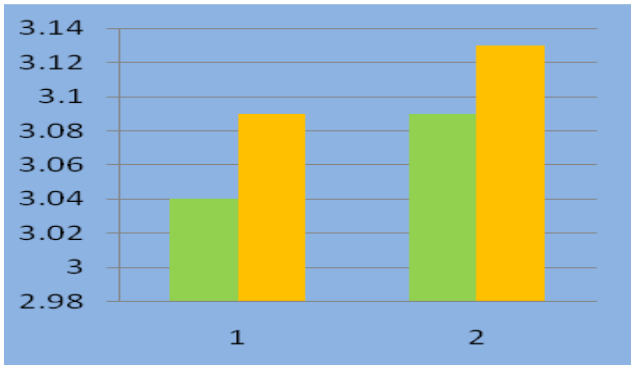

Fig. 5. Results of Chemistry lab guide analysis based on the Aspect of Stimulating Curiosity

Aspects of Developing Life Skills (Life Skills)

The results of the analysis of innovative practical guides that have been developed

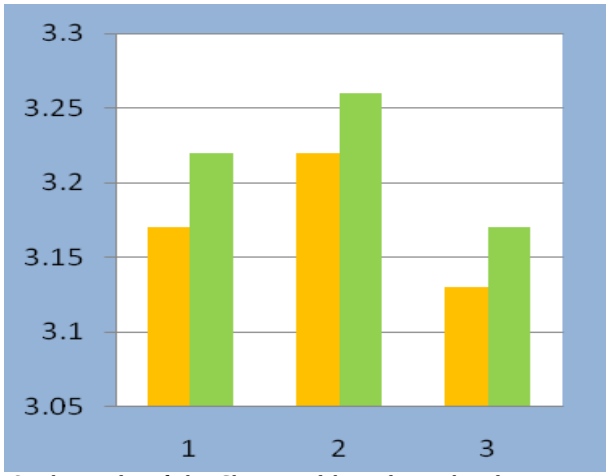

Fig. 6. The results of the Chemistry lab guide are based on aspects of Developing Life Skills (Life skills)

Language Aspects

The results of the analysis of innovative practicum guides that have been developed

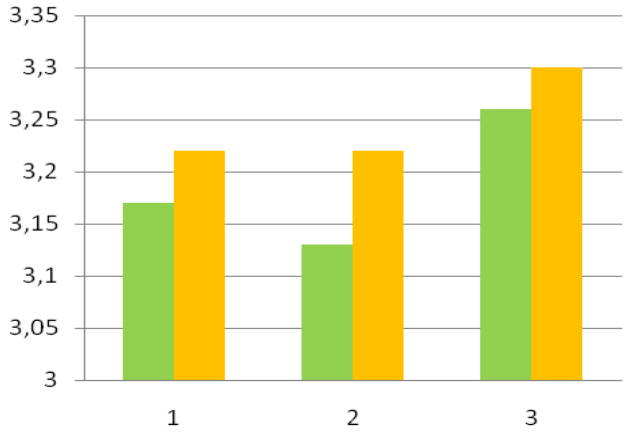

Fig. 7. The results of the Chemistry lab guide are based on aspects of language

Based on the average value of material coverage, composition of presentation, insight into productivity, stimulating curiosity, developing life skills, design and language shown above through a questionnaire conducted to 22 expert validators consisting of 20 teachers and 2 people The lecturer shows that The Chemistry Lab Guide book for High School base on Guided Inquiry to measure scientific attitude and science process skills material is valid and does not need to be revised and can be applied at a later stage by testing the guiding test to students to be applied to practicum at school.

Results of a Limited Trial of The Chemistry Lab Guide book for High School base on Guided Inquiry to measure scientific attitude and science process skills that have been developed

The last stage is the summative evaluation stage (stage V) Revised practicum guides are reproduced to be distributed to students. The division of this practicum guide aims to see the effectiveness The Chemistry Lab Guide book for High School base on Guided Inquiry to measure scientific attitude and science process skills material that has been developed.

To test the effectiveness of the practicum guides that have been developed, a limited trial was conducted. A limited trial was conducted to find out the students' mastery of the content of the chemistry lab guide that had been developed using 20 questions.

Each class, both the control group and the experimental group, was first subjected to a pre-test which aimed to determine the students' initial abilities and then was given treatment after which the students were given a final test (post-test). Average scores in pretest group 1 (using the school practicum guide) obtained an average score of 55.17 and group 2 (using the developed practicum guide) obtained an average value of 58.17. while for post test group 1 (using the school practicum guide) obtained an average value of 68.50 and group 2 (using the practicum guide developed) obtained an average value of 89.17. From the results of the acquisition of the average value of the pre test and post test there are differences so it needs to be determined the normalized gain value of learning outcomes in the class.

The normalized gain values in group 1 and group 2 were 0.30 and 0.73, respectively, so that it can be concluded that the average normalized gain values were low in group 1, which used school practicum guides, while in group 2 it was obtained average normalized gain value is high because it uses practicum guides that have been developed.

Based on student grades, it can be tested the effectiveness of the practicum guides that have been developed. Before the test is carried out, normality and homogeneity tests are first performed using pre-test and post-test

Hypothesis Test

Hypothesis testing is done using SPSS 17.0 with Paired sample sample t-test to test two related samples or called paired samples.

IV. CONCLUSION

The result of development that has been developed is more supportive of learning than existing guidebooks from various publishers, the aspects seen from the modified BSNP aspects are 7 aspects in the test feasibility, namely aspects of practicum coverage, systematic presentation, containing insight into productivity, stimulating curiosity, developing life skills, design and language

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