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Educational Research to Endorse Productive and Innovative Generation in the 21st Century

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Grand Mercure Hotel, Medan City, North Sumatera, Indonesia
October 16-17, 2017

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Preface

The 2nd Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL with web link is http://aisteel2017.unimed.ac.id/) was held on October 16-17, 2017 in Medan City, Indonesia. This conference was organized by Postgraduate School, State University of Medan (Unimed) and is the routine agenda at Unimed now. The Second Annual International Seminar on Transformative Education and Educational Leadership’ is realized this year with various presenters, researchers, lecturers and students from universities both in and out of North Sumatera participate in the theme of which is “Educational Research to Endorse Productive and Innovative Generation in the 21st Century.”

2nd AISTEEL is the annual international seminar with main aim is to discuss of recent research special for Transformative Education and Education Leadership. Several topics like: Teachers Education Model, Research Global Issue in Education, Mathematics and Science Education, Social, Language Education, Vocational Education, Curriculum, Economic, History and Management Education have been discussed at the 2nd AISTEEL 2017. 2nd AISTEEL international seminar provided experts’ view on transformative education and educational leadership as well as curriculum article presentation. There were five keynote speakers have been came Professor Keiichiro Yoshinaga, Dr. Bambang Sumintono, Dr. Sitti Maesuri Patahuddin, and Dr. Yulia Rahmawaty. The organizer had been use online submission system to receive all abstract, full paper and also communication with authors. All of information include with comment of reviewer can be cheked real time by author.

Chairperson

Dr. Rahmad Husein, M.Ed
Welcoming Speech of Director of Postgraduate School State University of Medan

The Second Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL)

The honorable,
- Rector of State University of Medan, Prof. Dr. Syawal Gultom, M.Pd.
- Vice Rectors of UNIMED
- Professor Keiichiro Yoshinaga, PhD, Institute of Liberal Arts and Science, Kanazawa University – Japan
- Dr. Bambang Sumintono, M.Ed., University Malaya – Malaysia
- Dr. Sitti Maesuri Patahuddin, Faculty of Education, Science, Technology and Mathematics, University of Canberra – Australia
- Yuli Rahmawati, Chemistry Education Program, Universitas Negeri Jakarta
- Deans of Faculties of Education, Languages and Arts, Social Sciences, Natural Sciences and Mathematics, Engineering, Sports Sciences, and Economics
- Vice Directors of Postgraduate School of UNIMED
- All speakers, lecturers, researchers, students, and participants

Good Morning
Welcome the honorable guests speakers Professor Keiichiro Yoshinaga, Dr. Bambang Sumintono, Dr. Sitti Maesuri Patahuddin, Assoc. Prof. Emilia Zulmira de FAN, and other speakers, lecturers and students from outside and inside Unimed to this international seminar which is the routine agenda at Postgraduate program of UNIMED now. I’m glad that ‘The Second Annual International Seminar on Transformative Education and Educational Leadership’ is realized this year with various presenters, lecturers and students from universities both in and out of North Sumatera and participate in the theme of which is “Educational Research to Endorse Productive and Innovative Generation in the 21st Century.”

Ladies and Gentlemen,

In this second seminar excels the first one related to the administration by online and the publication index by either Thomson Reuters or Google Schoolar. By the new policy on student’s publication, postgraduate program really matches the system, particularly for the students who will sit in the oral defence examination. Through the seminar, the postgraduate students improve their article journal writing and it is proved by many articles are submitted by the students.

The plenary speakers coming from 15 provinces in Indonesia will present topics covering multi disciplines. They will contribute a lot of inspiring inputs and new knowledge on current trending educational research topics all over the world. The expectation is that all potential lecturers will share their research findings to educational scientists and researchers as well for improving their teaching process and quality. Thus, this will contribute to the next young generation researchers to produce innovative research findings in education and educational leadership contexts.

This second seminar continues the promotion of the first sequel ‘Developing Future Teachers’ Education Model. Therefore, the propose of this second seminar on the transformative education and educational leadership research will trigger the young professional lecturers and educators to compete in the invention of innovative educational teaching and learning strategies, techniques and leadership.

I hope that the scientific attitude and skills through research will promote Unimed to be a well-known university which persists to be developed and excelled in the future.

Thank you the Rector of Unimed who always supports us in organizing the seminar. Thank you all guest and plenary speakers. Special thanks to both steering and organizing committee who have well-coordinated and colaborated in actualizing the seminar.

Director of Postgraduate Unimed

Prof. Dr. Bornek Sinaga, M.Pd
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Daulat Saragi
Project Based Learning Tools Development on Alcohol and Ether Materials at Natural Science Faculty State University of Medan

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Abstract: Project based learning tools development on alcohol and ether materials at Natural Science Faculty State University of Medan. This research has a purpose to develop and review organic chemistry materials of alcohol and ether topics using standard instruments of the National Board of Education Standards (BNSP). This research is a combination of research development and experiment or often referred with as research and development (R & D). This research begins by analyzing 3 syllabuses from 3 colleges. Project based learning tools of development result then reviewed by 3 organic chemistry lecturers and 30 students as sample of respondents in this research. Results of analysis with BNSP standards conducted by three lecturers and students on project based learning tools development on alcohol and ether materials for the feasibility of content with an average of 3.66%, feasibility of language 3.62%, feasibility of presentation of 3.56%, it can be concluded the average obtained from both parties is 3.61%. It means the project based learning tools development on alcohol and ether materials is valid and does not need revision.

Keywords: development; teaching materials; project-based

I. INTRODUCTION

Self-learning is a process that most determine the success of students in achieving the learning objectives. Independent learning can be done at any time and using self directed learning methods. Self-learning is also a process that is decisive in achieving the learning objectives. However, this process requires resources, one of which is a textbook, which is able to help students understand the learning material [1]. The results showed that the development of teaching materials has given good results in improving learning outcomes of learners. The results of Ramdani (2011) showed that 91.61% of learners considered that the learning module based on Mindjet Manager as an alternative material of organic chemistry learning[2]. Aisyi's research (2013) shows that the use of project-based teaching materials indicate that the use of teaching materials 67.7% of respondents agree that learning support materials as contextually assessed come from the nearest environment and are familiar with everyday life [3]. There are two factors that influence student's independent learning process including in studying organic chemistry, that is external factor and internal factor. External factors such as guiding modules, textbooks, internet access, and academic atmosphere. While the internal factors are learning motivation, perseverance, physical and mental health and ability to learn / learning skills.

In Organic Chemistry course there are some subject matter of which is the material of Alcohol and Ether. This material is closely related to daily life but some students say it is very difficult to understand the material. One of the factors of organic chemistry is still less desirable from the point of view of the researcher stated that the organic chemistry book has not given ease of students in studying organic chemicals. Solutions that can be done to facilitate the process of student learning in the course of organic chemistry, among others, by innovating teaching materials that are integrated with the model of scientific learning, among other models of project learning. Project-based learning is an innovative approach to learning, providing emphasis on contextual learning learners through complex and tangible activities [4] This model is also a learning approach that considers the project as a learning infrastructure [5]. Project-based learning is appropriate in organic chemistry learning because organic-based chemistry learning provides students with more collaborative opportunities, students are actively engaged in solving projects independently and collaborating on teams and integrating real and practical problems[6]. The development of project-based materials on alcohol and ether materials at Chemistry Department FMIPA State University
of Medan is one of the efforts to improve the competence of graduates.

II. RESEARCH METHODS

This research was conducted in Chemistry Department, State University of Medan on April 2015. Population in this research include (1) State University of Medan’s chemistry lecturer, (2) All students of the fourth semester of chemistry UNIMED. Samples were taken randomly (random sampling or probability sampling) by drawing 3 organic chemistry lecturers at State University of Medan, taking purposively at least 20% of total IV semester students majoring in chemistry State University of Medan , with category getting A / B value on organic chemistry.

Data analysis technique performed is a qualitative data analysis to be analyzed using descriptive analysis percentage using the formula:

\[ P\% = \frac{\sum q}{\sum r} \times 100\% \]

Description:

- \( P\% \): The percentage score obtained, in this case is the percentage of standard research component of the book according to BSNP.
- \( \sum q \): Number with the sign (\(^\vee\)) on the questionnaire of the assessment of alcohol-ether materials.
- \( \sum r \): The total number of concepts in the assessment’s questionnaire of alcohol-ether materials

IV. III. RESULT AND DISCUSSION

A. Syllabus Analysis And Organic Chemistry Textbook

The syllabus of Organic Chemistry which is used as the analysis material is syllabus from Universitas Pendidikan Indonesia (UPI), State University of Medan (Unimed) and Andalas University (Unand). From the results of the analysis of the three syllabuses prepared Comprehensive competence standards and basic competencies and become a new syllabus. The teaching materials in syllabus prepared for alcohol material are as follows: Common structures and formulas of alcohol compounds, for example alcohol compounds, classification of alcohols, chemical properties of alcohols, physical properties of alcohols, alcohol reactions, acidity and alkalinity of alcohols, alcohol manufacture, benefits of alcohol, phenol, thiols. The teaching materials composed of ether materials are as follows: general ether structures and formulas, ether’s nomenclature, physical properties of ether, etheric reactions, ether preparation, benefits of ether, epoxides, special ethers (cyclic).

- **Textbook Review Results**

The analysis was conducted on eight textbooks used in universities conducted by fourth semester students majoring in Chemistry Unimed with total of 30 respondents. Feasibility analysis of chemistry books content adjusted with instrument from BSNP with score 1-4 with component of assessment as follows: feasibility of content, feasibility of language and feasibility of presentation.
Inset 1 Graph Students Analysis Results Against 8 Textbooks

Based on the results of the graph obtained, the F-book gets the highest average score compared to the other book for the content feasibility component, the C text book gets the highest score for language eligibility and in book B gets the highest score for presentation feasibility compared to other textbooks.

B. Integrated Components in the Module

In the Alcohol and Ether module consists of basic competence (KD), learning indicator, concept map, the detailed material, examples of problems and solving at the end of submateri, a Selip topic is containing a special review made with the aim of linking material information with more complex in everyday life, the module contains the Project Tasks that must be done by Student, with the expectation that by doing student will more master the material of Alcohol and Ether, Summary in the End of the Module, Evaluation consisting of questions that have been adapted to Indicator learning, Glossary, Bibliography and Key answers.

Each of the sub subjects is organized in accordance with the students' development and the demands of the Competency Standards in the Organic Chemistry syllabus followed by the integration of learning innovation through instructional media in the form of animated video, practicum video and contained in the module. Learning model that can be integrated into the module, among others, such as scientific learning model (PBL, PjBL, Inquiry). The developed modules are equipped with examples of problems, assignments and solutions of each question. Procurement of instructional media on teaching materials is expected to help students in learning modules and help them to learn independently, is the most decisive process in achieving learning objectives. While the learning model is used for students more active and more motivated in understanding learning. In the final stages of development is prepared about the evaluation that can measure student's competence to the material.

C. Standardization and Assessment of Modules by Organic Chemistry’s Lecturers

From the analysis of the assessment conducted by three lecturers of Organic Chemistry FMIPA UNIMED Chemical Department of the materials based on the project of alcohol and ether. Where for the content feasibility of obtaining the results 3.71 %, for the language feasibility of obtaining the value of 3.71 %, for the feasibility of the presentation obtained a value of 3.00 %. Each description of the assessment is calculated on average of the values of the three assessment teams which then at the end of the study are calculated on average of all descriptions so as to know the final value of the module.

<table>
<thead>
<tr>
<th>Aspect of assessment</th>
<th>Lecturer I</th>
<th>Lecturer II</th>
<th>Lecturer III</th>
<th>Average</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility of contents</td>
<td>3.71</td>
<td>4</td>
<td>4</td>
<td>3.9</td>
<td>Valid and do not need revision</td>
</tr>
<tr>
<td>Feasibility of language</td>
<td>3.71</td>
<td>4</td>
<td>3.71</td>
<td>3.8</td>
<td>Valid and do not need revision</td>
</tr>
<tr>
<td>feasibility of presentation</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3.66</td>
<td>Valid and do not need revision</td>
</tr>
<tr>
<td>satisfaction responses</td>
<td>90 %</td>
<td>100 %</td>
<td>100 %</td>
<td>96.67 %</td>
<td>very satisfying</td>
</tr>
</tbody>
</table>

With the same instrument result of assessment from Chemistry Department student of 4th Semester, which has been through learning of Organic Chemistry I and certainly have passed the material of alcohol and ether with number of respondents as much as 30 people got average value 3.44 %. In terms of feasibility of content obtained score 3.44 %, feasibility of language score of 3.44 % and in terms of feasibility of presentation scored 3.44 %. This means that the Student gives a positive opinion on the development result module and means that study module of Alcohol and Eter has been made valid and does not need revision.
Inset 2: Obtaining the results of reviews by lecturers

Inset 3: Obtaining Result’s Standardization from Student
Based on table 2 above, the results obtained for the feasibility of content with an average of 3.66%, feasibility of language 3.62%, feasibility of presentation of 3.56%, it can be concluded the average obtained from both parties is 3.61%. By looking at the analysis criteria of the average value of project-based teaching materials, the average value in the interval value of 3.24-4.00% means the module is valid and does not need revision. And if you look at the average value of the results of project-based assessment of materials that have been made by researchers that is at a value of 3.61, it can be concluded that Alcohol and Ether-based projects that have been developed according to the standards of curriculum from the University especially Organic Chemistry is valid and do need revision.

D. Perception of Respondents' Satisfaction Against Development Results

Phase perception of materials satisfaction that has been standardized by student respondents and expert lecturers is done in line with the standardization of teaching materials that have been developed, to know whether or not the teaching materials developed to be used as reference of organic chemistry learning on alcohol and ether materials to the students. The perception of student satisfaction on project-based teaching materials on alcohol and ether material was 88.71% and perception of lecturer's satisfaction on project-based teaching materials on alcohol and ether material 96.67%.

V. IV CONCLUSION

The average results of the assessment of project-based materials that have been drawn up by lecturers and students obtained by 3.61%, it can be concluded that the alcohol-based materials and ether-based projects that have been developed according to curriculum standards of the University specifically Organic Chemistry is valid and no need revision (2) Alcohol and Ether based project development modules consist of sub subjects arranged in accordance with University curriculum requirements integrated learning innovation through instructional media in the form of animated video, practice video and contained in module with scientific learning model. (3) Overall respondents also agree that the development result module will be very helpful and excellent as a learning resource on alcohol and ether materials with 96.67% satisfaction percentage by lecturers and 88.71% by students.

REFERENSI


