

# Potency of Science Learning Oriented to Local Wisdom and Tourism in Enhancing Students Learning Performance

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**Abstract:** This study aims to evaluate the level of application of chemistry learning oriented to Lombok local wisdom and tourism in teaching chemistry and student learning performance in the application of the learning. This research used descriptive design. The sample of the study is 65 students that consist of 20 biology education students, 30 chemistry education students, and 15 of physics education students at UNDIKMA in the academic year 2019-2020. Data were collected by questionnaire, protfolio, and observation. Furthermore, chemistry learning oriented to Lombok local wisdom and tourism was applied to 28 chemistry education students participating in natural chemistry courses. Student learning performance was evaluated by using scientific paper portfolio and observation of discussion activities. The results showed that the level of application of science learning oriented to Lombok local wisdom and tourism for students of biology, chemistry and physics education courses of UNDIKMA was in the poor category with a percentage of 33.75%. The students' learning performance in writing papers and group discussion processes were 78,63 and 83,39, respectively, which were in the very good category. The response to the idea of applying chemistry learning oriented to Lombok local wisdom and tourism in UNDIKMA Chemistry education study program was in a very good category with a percentage of 84.44%. Respondents believed that the application of chemistry learning oriented to Lombok local wisdom and tourism would increase students' motivation and attitudes in learning, as well as potential to provide students the skills as problem solvers and agents of change within the society that has unique local wisdom and potential tourism.

## INTRODUCTION

Education can improve human life both in terms of potential, attitudes and in terms of thinking<sup>2</sup>, in other words education can improve the quality of human resources. This statement is in line with the mandate of Law No. 20 of 2003 concerning the national education system which states that the goal of national education is to develop the potential of students to become human beings who believe and have devotion to God Almighty, noble, healthy, knowledgeable, competent, creative, independent, and become a democratic and responsible citizen. The curriculum used in the learning process must pay attention to the potential of the area and environment where students live. As mandated by the law, learning must be based on local excellence. Based on the above, local wisdom can be used as a way to carry out the 2013 curriculum which has the characteristics of the educational application that students get in schools in a community environment. This is in line with<sup>1</sup> which states that local wisdom is closely related to education. In line with<sup>2 3</sup> opinion, the transmission of local wisdom must have a reciprocal relationship between autonomous learning networks to play an important role in national development.

According to <sup>4</sup>, current chemistry learning must be able to shape students into problem solvers with scientific characteristics. Students are able to compare natural tendencies and naturally distinguish objects and events. According to <sup>5,6</sup>, an effective learning environment is formed by helping students concentrate on something that is understood, generating ideas; help students develop a conceptual understanding of specific knowledge; and transforming conceptual understanding into skills in developing categories, creating algorithmic formulations, generating and testing hypotheses. Therefore, to achieve these learning objectives, it is important to make scientific literacy the focus of learning outcomes.

The main challenge for bachelor education graduates in NTB is to be able to use the knowledge and skills they have to give color to society, become agents of change, and problem solvers. Therefore, they must be introduced to the potential and problems that exist in their community and given the experience to suggest and try out the solutions it offers in a learning activity on campus. They must be directed to the development of scientific literacy through learning. One of the ways to do this is through learning environmental chemistry in universities. Environmental chemistry learning must be oriented towards local wisdom and community tourism

Identification of local wisdom is needed to provide insight and development of student scientific literacy. Studies on the identification of scientific literacy that can emerge are also very necessary <sup>7,8</sup>. Through tourism-oriented environmental chemistry learning and local wisdom students can gain knowledge about chemical aspects in the tourism industry and the socio-cultural wealth of the community. That way they will become agents of improvement and progress in the community. For example, an insight into the excellent culinary of Mataram, which is so delicious, can be used as learning material for students about aspects of physics and chemistry that need to be considered to produce delicious tofu and then can suggest what modifications are needed to improve the quality of tofu. Then from an environmental aspect, the fact is that the process of making tofu produces waste that can pollute the environment while tofu craftsmen do not have the knowledge and skills regarding tofu waste handling. Pollution arising from the economic activities of a densely populated environment can become a socio-scientific issue in learning scientific literacy. These issues can encourage students to understand the context, use their knowledge and competencies to suggest solutions, and decide the right attitude towards the problem. According to <sup>9</sup>, every science learning that uses a unique local wisdom context should be accompanied by a unique assessment instrument according to the learning experience.

The application of local culture-based learning has proven to be effective in making student interest, scientific literacy, and learning achievement better <sup>10,11,12</sup>. Character building, knowledge, skills, and student performance in science learning can be done by presenting local wisdom as science teaching material. The presence of local wisdom as science teaching material can increase knowledge, social attitudes, tolerance, problem solving abilities, scientific communication, critical thinking skills, and students' scientific literacy <sup>13,14,15,16</sup>. Bagaimana penerapan pembelajaran berorientasi kearifan lokal dan kepariwisataan dalam pengajaran sains di UNDIKMA. How do students respond to ideas for implementing local wisdom-oriented learning and tourism in science teaching at UNDIKMA. How is the quality of student learning performance in chemistry learning oriented by local wisdom and tourism education. These problems are the focus of this study and will be described in this research article.

## METHODS

This study uses a descriptive design that is used to describe the level of application of chemistry learning oriented to local wisdom and tourism in the Lombok community, and student responses to the idea of chemistry learning oriented to local wisdom and tourism in Lombok society.

Sample on evaluating the application level of science learning oriented to local wisdom and community tourism were collected using a purposive sampling technique. The sample of the study is 65 students that consist of 20 biology education students, 30 chemistry education students, and 15 of physics education students at UNDIKMA in the academic year 2019-2020. These students were semester 2, 4, and 6 students who had taken Basic Chemistry

courses in each study program. Data were collected using a questionnaire method. The questionnaire on the level of application of chemistry learning oriented to local wisdom and tourism in the Lombok community consists of 10 statement items. Response options to statement items are never, rarely, sometimes, often, and always. Scores of 0, 1, 2, 3, and 4 are awarded for the corresponding answer choices, respectively. The data obtained were confirmed by interview techniques.

Furthermore, it is applied. After that, chemistry learning is carried out which is oriented to local wisdom and tourism. The learning was only applied to 28 chemistry education students participating in the natural chemistry course. Student learning performance is evaluated by using scientific paper portfolio techniques and observation of discussion activities. In this local wisdom and tourism oriented chemistry learning, students are taught through scientific investigative activities which include observation of the context of local wisdom and tourism in the Lombok community, communicating the results of observations in group discussions, formulating problems, carrying out problem solving processes through scientific inquiry and laboratory work activities. , communicate the results of the investigation through the preparation of articles on the results of investigations and group discussions.

Student response data regarding the idea of chemistry learning oriented to local wisdom and tourism<sup>6</sup> in the Lombok community were collected using a questionnaire consisting of 14 items. The answer choices **strongly disagree, disagree, doubt, agree, and strongly agree**. A score of 1, 2, 3, 4, 5 is given **respectively** for answers to positive statements and vice versa for negative statements. After the data was collected through questionnaires and observations, interviews were conducted to confirm respondents' responses and observations.

The data obtained were analyzed by calculating the percentage. The description of the results of the data analysis was carried out by referring to the percentage criteria as presented in table 1.

**Table 1. Percentage Criteria**

Percentage	Criteria
81-100	Very good
61-80	Good
41-60	Fair
21-40	Less
<21	Bad

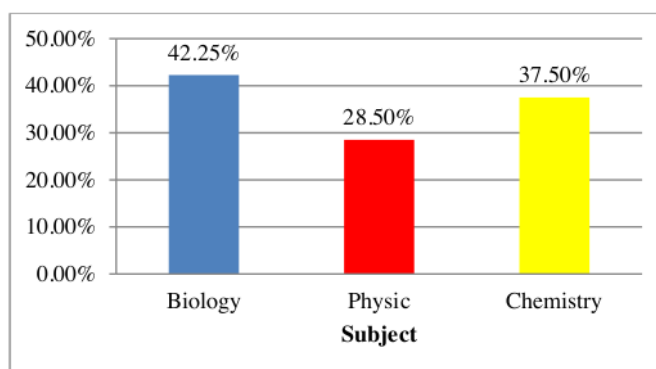
## RESULT AND DISCUSSION

### Application of Science Learning Oriented to Local Wisdom and Tourism

Based on the data presented in Figure 1, the level of application of science learning oriented to local wisdom and tourism in several science education study programs (chemistry, physics, and biology education) is below 50%. The lowest score is taken place by physics education programs namely 28.50 %. In case of basic chemistry course, this can be caused by the context of learning chemistry for physics students is different from chemistry learning for chemistry and biology students, even though the basic chemistry course they take has the same material coverage. Chemistry courses for chemistry and biology education program students can be related to contexts that are close to local wisdom and tourism in Lombok, for example the use of cow dung for maintenance of house floors by the Sade village people.

A study conducted by<sup>17</sup> which explores the local wisdom of the Mozambique people related to the concept of physics shows that there are several potential concepts to increase awareness of local wisdom and the values contained in it, and integrate it into science learning. Among the physics concepts related to local wisdom mentioned in<sup>17</sup> research are thermal conductivity, condensation and evaporation, electricity, applied force, pressure and surface tension, energy transformations and impulse. The lack of integration of local wisdom in chemistry courses for physics students can also be caused by the lack of exploration of physics concepts related to chemical concepts as

well as local wisdom and tourism in the Lombok people. Indeed, local wisdom related to physics concepts is still rarely explored and utilized by teachers <sup>18</sup>.



**Figure 1.** Diagram of the Level of Application of Science Learning Oriented to Local Wisdom and Tourism in Science Learning

The **5**k of application of chemistry learning oriented to local wisdom and tourism can be seen from several aspects (Table 2). Based on the data in Table 2, it can be seen that the application of chemistry learning lectures starting with the context of local wisdom and the wisdom of the Lombok people is very lacking (20.28%). Lecture material is not practically connected to the context and products of local wisdom and tourism of the people of Lombok (31.39). The lecture material also did not discuss in depth about chemical knowledge and skills related to local wisdom products and tourism in the people of Lombok (25.97%). Culture as a part of local wisdom is one type of everyday life chemistry which can be used to connect science and daily life, making chemistry learning more relevant for the students <sup>19</sup>. Local wisdom enables science learning to be contextual and meaningful for the students <sup>20</sup>. The low level of enactment of Lombok local wisdom & tourism into chemistry learning at the university should open more opportunity to develop learning material based on local wisdom and tourism in Lombok, and in Indonesia at large.

**Table 2.** Aspects of the Application of Science Learning Oriented to Local Wisdom and Tourism

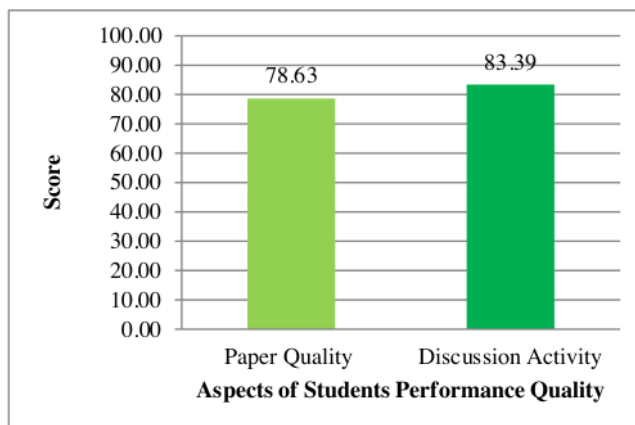
Aspects of Lecturing Process	Percentage	Categori
The lecture starts with the context of local wisdom and tourism in the people of Lombok	20,28%	Bad
Lecture materials are practically linked to the context and products of local wisdom and tourism in the people of Lombok	31,39%	Less
The lecture material is an in-depth discussion of chemical knowledge and skills related to local wisdom products and tourism in the people of Lombok.	25,97%	Less
<b>Total</b>	<b>33,75%</b>	<b>Less</b>

The pujat community's habit of using rembiga plant sap to deal with toothache complaints can be a learning material for students about the plant's chemical active ingredients which function to reduce toothache complaints, how to isolate them, and use them for toothpaste production. Various variants of Sumbawa oil, Sumbawa honey, mamaq culture, a penchant for eating spicy food, the use of dyes for textiles and food, crop rotation and different types of plants in various regions, are some of the customs of the community that can be the object of study of the course.



### Student's Learning Performance in Chemistry Learning Oriented by Local Wisdom and Tourism Education

On the next step of this study, application of learning oriented by local wisdom and tourism was carried out toward 28 chemistry education students participating in the natural chemistry course. Chemistry learning performance is oriented towards local wisdom and student tourism seen from papers and discussion activities (Figure 2). Student performance seen from the aspect of discussion activities is higher than that of papers. The discussion activity that looks the most prominent of them are paper quality and discussion activity. This shows that the application of science (chemistry) learning oriented to local wisdom and tourism can help students achieve excellent discussion activities and produce good quality articles. Referring to <sup>1 3</sup> learning oriented to local wisdom can improve students' critical thinking skills, problem-solving abilities, and scientific communication.



**Figure 2.** Diagram of Students Learning Performance on Chemistry Learning Oriented by Local Wisdom and Tourism.

### Student Response to Learning Chemistry Oriented by Local Wisdom and Tourism

In general, the students gave a very good response to chemistry learning oriented to local wisdom and tourism in the Lombok area (Table 3).

**Table 3.** Responses to the Ideas of Learning Chemistry Oriented by Local Wisdom and Tourism

Responses	Persentase	Kategori
Learning oriented to local wisdom and tourism in the people of Lombok will be able to increase students' learning motivation	80,25%	Very Good
Learning oriented to local wisdom and tourism in the Lombok community will be able to provide experiences in understanding the context, the acquisition of knowledge and skills, as well as a positive attitude according to the needs of graduates and society.	80,15%	Very Good
Learning oriented to local wisdom and tourism in the people of Lombok is able to provide graduates as problem solvers and agents of change in society	85,91%	Very Good
Total	83,44%	Very Good

Each aspect of the response to the idea of learning chemistry oriented to local wisdom shows the percentage above 80%. According to the students, chemistry learning is oriented to local wisdom and tourism in the Lombok people will be able to increase students' motivation to learn chemistry and can provide experiences in understanding the context, the acquisition of knowledge and skills, and a positive attitude according to the needs of graduates and

society. In addition, learning oriented to local wisdom and tourism in the people of Lombok is considered capable of providing graduates as problem solvers and agents of change in society. The results of the questionnaire were confirmed through the results of interviews with students who have taken chemistry courses oriented to local wisdom and tourism, as shown in the following encrypt of students' response: The discussion in class was interesting because we were talking about the local wisdom which is very close to our lives. Moreover, we were very enthusiastic in relating the local wisdom with the chemistry contents of the learning.

## CONCLUSION

The results showed that the level of application of science learning oriented to local wisdom and tourism of the Lombok people for students of the Biology, Chemistry Education and Physics Education study programs of UNDIKMA was in the low category with a percentage of 33.75%. Student learning performance in compiling papers and group discussion processes in natural chemistry course with learning oriented to local wisdom and tourism in Lombok society has a consecutive score of 78.63 in the good category and 83.39 with the very good category. The response to the idea of applying chemistry learning oriented to local wisdom and tourism of the Lombok people in the Chemistry Education Study Program UNDIKMA was in the very good category with a percentage of 84.44%. Respondents believed that the application of chemistry learning oriented to local wisdom and tourism of the Lombok people would be able to increase learning motivation and student attitudes in learning, as well as provide provisions that are in accordance with the needs of graduates as problem solvers and agents of change in a community that has unique local wisdom and potential tourism.

## ACKNOWLEDGE

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