

# Development of Student Worksheet with an Ethnoscience Approach to Wati Plants Through Liveworksheet Applications

Nia Sahnia Rumadan <sup>a</sup>, Henie Poerwandar Asmaningrum <sup>b, \*</sup>, Novike Bela Sumanik <sup>c</sup>

<sup>a, b, c</sup> Education of Chemistry Department, Faculty of Teacher Training and Education, Musamus University Kamizaun street, Merauke, Papua, Indonesia

\*Corresponding author: poerwandar@unmus.ac.id

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**ABSTRACT:** This study aims to develop the student worksheet on Addictive Substances material with the Wati Plant ethnoscience approach through the Liveworksheet application that is feasible in terms of validity and practicality. This type of research is R&D research using the ADDIE model, namely: Analyze, Design, Development, Implementation, and Evaluation. However, this research is limited to the third stage, namely the Development stage. The research subjects were one material expert, one media expert, one practitioner, and ten students of the Chemistry Education Department, Musamus University. The instruments used in data collection were interview guidelines and questionnaires. The results showed that the student worksheet on Addictive Substances material with the Wati Plant ethnoscience approach through the Liveworksheet application got a percentage of 94% at the 6th meeting and 97% at the 7th meeting from material experts, 95% at meetings 6 and 7 from media experts, 84% at the 6th meeting and 86% at the 7th meeting of practitioner responses and 90% at the 6th meeting and 88% at the 7th meeting of student responses. Based on the results of these studies, it can be concluded that the student worksheet on Addictive Substances material with the Wati Plant ethnoscience approach through the Liveworksheet application is feasible in terms of validity and practicality aspects.

**Keywords:** student worksheet, ethnoscience, Wati plant, Liveworksheet application,

## INTRODUCTION

Advances in technology and science are one of the factors measuring the development of a nation, especially in the field of education which has created reforms. The development of science and technology relies on the development of the potential of natural resources and human resources [1]. Indicators in improving human resources are related to the quality of student learning outcomes. So the need for student services is increasingly being encouraged for educational renewal. Every learning will surely find various problems in learning, because the more modern technology so that the paradigms will follow these developments. As with current learning, it is required that students be more active. The root of the problems that are often experienced by students in the development of science and technology is learning difficulties.

Learning difficulties are a condition experienced by students with unwanted things happening, so that learning objectives are not achieved [2]. Blassic and Jones [3] said that students had learning difficulties because they had several deficiencies in the learning process, both in perception, memory, attention or motor function. Moreover, learning is currently being conducted online due to the Covid-19 outbreak, so that based on the Policy of the Ministry of Education and Culture of the Republic of Indonesia through Circular Letter Number 4 of 2020 regarding the Implementation of Educational Policies during the emergency period of the spread of Covid-19, namely by using online learning.

The solution for learning during the Covid-19 pandemic is online lectures, this is done to prevent the spread of the virus. Online lectures are learning that is carried out online where subject matter is given through software or applications that are easily accessible by students. Lectures conducted online require lecturers to take advantage of existing technology, because the quality of learning has a very close relationship with the use of technology [4]. According to Yustanti & Novita [5] students and lecturers must have technology literacy skills that should be applied during class learning, the goal is that students and lecturers do not experience difficulties when taking chemistry lessons that are applied online.

Chemistry is a branch of natural science that studies the composition, properties of matter, changes in matter and the energy that accompanies these changes. Therefore, in studying chemistry, a suitable media is needed in visualizing the material so that it is easily understood by students [6]. At the Faculty of Teacher Training and Education in Musamus University contextual chemistry courses are courses taken in semester 4 of the Chemistry Education Department. Contextual chemistry is a course that relates something in real life to the material taught to students in order to connect their knowledge with the surrounding environment [7]. The wati plant is one of the main materials in the contextual chemistry course, the purpose of studying the wati plant is so that students can know, understand the chemical content contained in the Wati plant.

Based on the results of interviews with students who have taken contextual chemistry courses, especially students of class 2019 running smoothly because of the Covid-19 pandemic which requires the learning process to be carried out online where the strategies, media, and learning methods used are obstacles, causing students to not understand the material. In addition, learning resources are still lacking so that the absorption of information to understand contextual chemistry material cannot run optimally.

Student Worksheet is a teaching material that contains teaching materials, summaries, and instructions for use in doing assignments that must be done by students, both theoretical and practical in accordance with the competencies to be achieved by students [8]. Based on this opinion, the use of student worksheet has various advantages, namely making students more active in the learning process, training to solve problems and developing students' ways of thinking, being used as a guide for lecturers and students in learning, help students increase their knowledge of the material in learning activities, and become a learning resource made by lecturers for students that allows students to study independently.

The ethnosience approach is a learning design that constructs original science that develops in a community environment that is converted into scientific science [9]. Genuine scientific knowledge consists of all knowledge pertaining to the facts of society that have been passed down from generation to generation. The scope of native science includes agriculture, medicine, ecology and about the benefits of flora and fauna. On the other hand, scientific science cannot stand alone, so further explanation is needed to provide comprehensive and holistic skills to students in various learning areas [10]. Therefore, contextual chemistry is a course that implements local cultural traditions in the community. In other words, learning chemistry requires students to be able to understand chemical concepts that require concrete examples related to everyday life.

Local culture in each region varies according to their respective characteristics, one of the local cultures in Merauke, Papua is the wati plant. The wati plant is known internationally as "kava" which is used by local people as traditional medicine. The wati plant is one of the main materials in contextual chemistry courses, the purpose of studying the wati plant is so that students can know, understand the chemical content contained in the wati plant.

Liveworksheet is an application provided free by Google. Liveworksheets can turn traditional worksheets into interactive online exercises as well as automatically correct them [11]. Media Liveworksheet can be designed by including videos, images to complement the teaching materials that are packaged in the form of interactive student worksheets. Media Liveworksheet also makes it easier for lecturers to make teaching materials, both in the form of e-modules and worksheets (Eliana et al, 2020). The liveworksheet application is a media that is easily accessed by students without having to download the application, just click on link shared by the lecturer and follow orders the use of modules or worksheets made by lecturers [11].

Similar research was conducted by Andriyani [11] regarding the implementation of PBL based on student worksheet by liveworksheets application which showed the results that the increase in student learning mental activity was 86.27%. In this case, the researcher wants to develop the student worksheet on Addictive Substances material with the Wati Plant ethnosience approach through Liveworksheet application that is worthy of being reviewed from the aspect of validity and practicality.

## METHOD

This type of research is Research and Development (R&D). The development model used is the ADDIE model, namely Analyze, Design, Development, Implementation, and Evaluation [12] which can be seen in Figure 1.

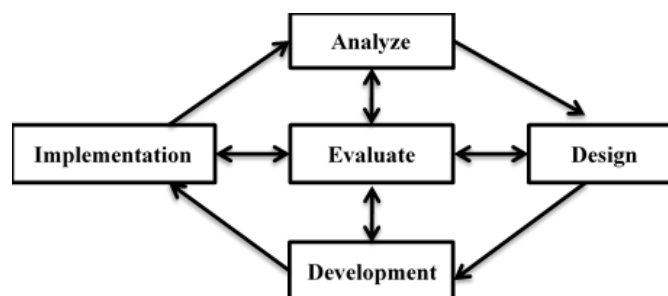


FIGURE 1. ADDIE Development Model

The following 4 steps of ADDIE development research are Analyze: the activities carried out in this stage are analysis of students to determine student characteristics that are in accordance with the design of learning media development and material analysis so that the content of the material contained in the student worksheet is in accordance with the main material in the subject. contextual chemistry course; Design: the activities carried out in this stage are designing the prototype of the student worksheet; and Development: After design the product validated by material and media experts. Implementation: After validation and declared valid by the experts, the product will be tested limited to practitioners and students.

This research was conducted at the Department of Chemistry Education, Musamus University. This research was conducted in August to September 2021. The research subjects were one material expert, one media expert, one practitioner and ten students of Chemistry Education Department, Musamus University. The instruments used were interview guidelines and questionnaires.

The analytical technique used in this research and development is an analysis that is able to support the achievement of the objectives of the research activities and those carried out. The results of the questionnaire will be qualified according to the established indicators and assessment criteria. Data analysis techniques for material expert validation sheets, media, practitioner responses and student responses to the develop the student worksheet on Addictive Substances material with the Wati plant ethnoscience approach through Liveworksheet application are as follows:

1. The assessment criteria for the instrument sheet are as follows:

1 = Very not good  
 2 = Poor  
 3 = Fair  
 4 = Good  
 5 = Very Good

2. Use the following formula to calculate the average score or total score below:

$$\bar{x} = \frac{\sum \bar{x}}{n}$$

Description:

$\bar{x}$  = average score all aspects  
 $\sum \bar{x}$  = total item scores for all aspects  
 n = number of statement items

3. From the calculation of the scores for each question from material experts, media experts, practitioner responses and student responses, the percentage of respondents' overall answers is sought by the formula [13].

$$P = \frac{\sum x}{\sum x_i} \times 100\%$$

Description:

P = Percentage  
 $\sum x$  = total number of respondents answers  
 $\sum x_i$  = total maximum value

## RESULT AND DISCUSSION

In the ADDIE model there are three stages of development are taken. First stage is analyze, At this stage the researcher conducts an analysis of students and analyzes the material. Several

students who had taken contextual chemistry courses were interviewed to find out the learning conditions and the basic difficulties in contextual chemistry courses that needed to be solved. Interviewed result described that class is not going well because of the Covid-19 pandemic which requires the learning process to be carried out online where the strategies, media, and learning methods used are obstacles that cause students to lack understanding of the material. Meanwhile learning resources are still lacking so understanding contextual chemistry information cannot run optimally. Therefore, it is necessary to develop an online learning plan and learning media in the form of student worksheets. Interesting and interactive student worksheets can be created through several free applications. In this study, the worksheet was developed through the Liveworksheet application.

For material analysis, discussions were held with contextual chemistry lecturers to determine which materials could be developed through the Liveworksheet application. After going through several considerations, it was agreed that the material to be developed in the worksheet was the potential for addictive substances in the Wati plant. The Wati plant is a sacred plant of the Marind Tribe which is only used in traditional ceremonies. The efficacy of the Wati plant is as a medicine. but if taken in excess can cause temporary paralysis. This is because the Wati plant contains addictive substances, namely metistisin and dihydrometistisin which are sedative and kawain and dihydrokawain which are narcotics.

Second stage is design. At this stage, data collection related to the wati plant material and its chemical content was carried out. Data collection was carried out by means of literature studies and direct interviews with Wati planters. After that, a student worksheet was designed consisting of the title, learning objectives, introduction to the Wati plant, scientific concepts, conclusions, and practice questions. The design results are then applied to the Liveworksheet application. In the Liveworksheet application, a video link of the researcher's interview with the Wati planter is also added. Student worksheets are made for 2 lecture meetings which is 6<sup>th</sup> meeting and 7<sup>th</sup> meeting. The 6<sup>th</sup> meeting discussed the identification of local plants in Merauke and the use of Wati plants. The 7<sup>th</sup> meeting discussed the study of the chemical composition of the Wati plant.

The third stage is development. At this stage validation is carried out to material expert and media expert to see the feasibility of the product developed by the researcher. Validation is done by giving the product that has been developed to the experts then the experts assess the aspects of their respective fields. Material validation is carried out by contextual chemistry lecturers. Validation of learning materials is carried out so that the scope of material presented in the developed LKM is in accordance with the scope of material used in learning activities. Validation is done by providing material that has been prepared by the researcher and accompanied by a validation sheet to the material expert. The data from the material expert validation is shown in table 1.

**TABLE 1.** Material Expert Validation Results

No	Statement	Score	
		6 <sup>th</sup> meeting	7 <sup>th</sup> meeting
1.	As per online learning plan	5	5
2.	In accordance with learning goals	4	5
3.	The clarity of learning activities	5	5
4.	Support learning strategies in achieving indicators	5	5
5.	Relevance of the material with learning objectives	5	5
6.	Systematic presentation of the material	5	5
7.	Conformity of material with indicators	5	5
8.	Clarity of material description	5	5
9.	Clarity of use of terms	4	4
10.	Relevance of material with daily life	4	5
11.	Use of language that is easy to understand	5	5
12.	The videos and pictures presented support the material	5	5
13.	Benefits for additional insights	5	5
14.	The formulation of the questions is in accordance with the learning objectives	5	5
15.	Clarity of instructions for working on questions	4	5
16.	The difficulty level of the questions is in accordance with the achievement of the expected goals	5	4
17.	Motivate students in learning	4	5
<b>Total score</b>		<b>80</b>	<b>83</b>
<b>Maximum score</b>		<b>85</b>	<b>85</b>
<b>Average score</b>		<b>4,7</b>	<b>4,8</b>

No	Statement	Score	
		6 <sup>th</sup> meeting	7 <sup>th</sup> meeting
Percentage		94%	97%
Category		Very Good	

Material expert validation was carried out 2 times with 1 revision. The following are some revision notes from material experts, namely improving learning strategies that support online learning and adding a glossary of terms. Material expert validation got a percentage of 94% at 6<sup>th</sup> meeting and 97% at 7<sup>th</sup> meeting which means it is included in the very good category.

Media validation was carried out by lecturers of the Informatics Engineering Study Program, Musamus University. Media validation was carried out to determine the feasibility of the worksheets as online learning media. The results of media expert validation are shown in Table 2.

TABLE 2. Media Expert Validation Results

No	Statement	Score	
		6 <sup>th</sup> meeting	7 <sup>th</sup> meeting
1.	Clarity of instructions for using instructional media	5	5
2.	The accuracy of choosing the background color and text color	4	4
3.	Screen view	5	5
4.	Color combinations	4	4
5.	Easy to understand language	5	5
6.	Readable text and writing	5	5
7.	Layout of text and images	5	5
8.	video voice clarity	5	5
9.	Quality of design appearance	4	4
10.	Easy to use media	5	5
11.	Program speed	5	5
12.	Media interest	5	5
13.	Learning media creativity and innovation	5	5
14.	Reusable	5	5
<b>Total score</b>		<b>67</b>	<b>67</b>
<b>Maximum score</b>		<b>70</b>	<b>70</b>
<b>Average score</b>		<b>4,7</b>	<b>4,7</b>
<b>Percentage</b>		<b>95%</b>	<b>95%</b>
<b>Category</b>		<b>Very Good</b>	

Media expert validation was also carried out 2 times with 1 revision. Here are some revision notes from media experts, namely the 6<sup>th</sup> and 7<sup>th</sup> meetings must be in sync and have a consistent appearance, the table of contents needs to be corrected and correct some typing errors. The media expert validation got a percentage of 95% at the 6<sup>th</sup> and 7<sup>th</sup> meetings which means it is included in the very good category.

The final product of the worksheet that has been validated by material expert experts and media experts is shown in Figure 2.

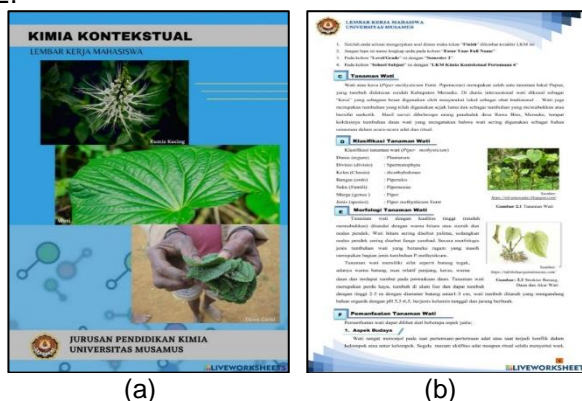


FIGURE 2. Final product of worksheet (a) worksheet's cover (b) worksheet's content

The fourth stage is implementation. At this stage a limited trial is carried out with practitioners and 10 students to see the practicality and attractiveness of the worksheet with the live worksheet application. Limited trials are carried out by providing products that have been validated by experts, then practitioners and students provide responses to the products developed.

**TABLE 3.** Practitioner's Assessment

No	Statement	Score	
		6 <sup>th</sup> meeting	7 <sup>th</sup> meeting
1.	Material clarity	4	4
2.	The attractiveness of the view	4	4
3.	Ease of use	4	5
4.	Easy to understand language	4	4
5.	Information clarity	4	4
6.	Usefulness in learning	5	5
7.	Media support for student independence	4	4
8.	Worksheets can improve student understanding	4	4
9.	Worksheets creativity and innovation	5	5
10.	Reusable	4	4
<b>Total score</b>		<b>42</b>	<b>43</b>
<b>Maximum score</b>		<b>4,2</b>	<b>4,3</b>
<b>Average score</b>		<b>4,2</b>	<b>4,3</b>
<b>Percentage</b>		<b>84%</b>	<b>86%</b>
<b>Category</b>		<b>Very Good</b>	

The percentage of practitioners was 84% at the 6th meeting and 86% at the 7th meeting, which means they are in the very good category. Before getting these results, there were several revisions given by the practitioner, namely making student center learning activities and making game questions according to cognitive targets.

Student responses are carried out after expert validation and practitioner responses. This aims to determine student perceptions of the worksheets developed with the live worksheet application. Student responses were carried out by giving product worksheets that had been prepared by researchers and included with response sheets to 10 respondents who were students of the Chemistry Education Department, Musamus University. The results of student responses are shown in Table 4.

**TABLE 4.** Students Respond

No	Statement	Score	
		6 <sup>th</sup> meeting	7 <sup>th</sup> meeting
1.	Ease of understanding the material	44	43
2.	Easy to understand language	46	46
3.	Video and image compatibility	44	42
4.	The attractiveness of the liveworksheet	45	44
5.	Ease of use	44	42
6.	Liveworksheet display	44	45
7.	Liveworksheet support for student self-reliance	44	45
8.	Increase motivation to study	46	44
9.	Additional knowledge	47	47
10.	Application of media to materials	47	42
<b>Total score</b>		<b>451</b>	<b>440</b>
<b>Maximum score</b>		<b>500</b>	<b>500</b>
<b>Average Percentage</b>		<b>90%</b>	<b>88%</b>
<b>Category</b>		<b>Very Good</b>	

The application of worksheet media on the potential for addictive substances in the Wati plant obtained a percentage of 94% at the 6th meeting and 88% at the 7th meeting in the very good category. This shows that the worksheet with the liveworksheet application is suitable for application to contextual chemistry.

The purpose of this study was to determine the validity of material experts and media experts as well as the responses of practitioners and students to student worksheets on the potential addictive substance of the Wati plant with the live worksheet application. This developed product can help lecturers and students in online learning, as well as help students learn independently and not get bored because the worksheets are equipped with various pictures, videos and practice questions in the form of games.

The strategy used in the 6th meeting is investigation where this method is a cooperative learning model that requires students to explore or find information about the material being studied (Medyasari et al, 2017). By using the investigation method, students will learn actively, can develop critical thinking skills, can build knowledge independently to explore a fact, can generalize and organize the ideas obtained [14]. The learning strategy used in meeting 7 is contextual teaching and learning (CTL). According to Sanjaya [15] CTL is a learning strategy that connects lesson content with real-life situations, and encourages students to link the knowledge and experience gained at school with their lives as family members and citizens.

There are advantages and disadvantages in using the live worksheet application. The advantages of the live worksheet application are that the live worksheet application is easy to access, students and lecturers do not need to download the live worksheet application because it has been provided free of charge by google, worksheets with the live worksheet application are distributed in the form of links, making it easier for lecturers to recapitulate the results obtained by students, because the live worksheets provide grades to students automatically, as well as practice questions can be made in the form of various games such as matching pictures, puzzles, listening, drag and drop and others.

The disadvantage of the live worksheet application is that in making teaching materials such as worksheets, e-modules and others, it is only limited to 9 pages, the file size is limited to 5 MB, the recap of grades obtained by students has a time limit of 30 days, if it is more than the specified time limit. then the result of the recap of values will be automatically deleted, and cannot edit the text of the material in the liveworksheet application [11].

## CONCLUSION

Feasibility of the student worksheet on Addictive Substances material with the Wati Plant ethnosience approach through Liveworksheet application in terms of the validity aspect can be seen from the assessment of the material expert who scored 94% at the 6th meeting and 97% at the 7th meeting. The media expert's assessment got a score of 95% at the 6th meetings and the 7th meeting which classified into the very good category. The feasibility of the student worksheet on Addictive Substances material with the Wati Plant ethnosience approach through Liveworksheet application in terms of practicality aspects can be seen from the practitioner's assessment that it scored 84% at the 6th meeting and 86% at the 7th meeting which was in the very good category. Meanwhile, student responses scored 90% at the 6th meeting and 88% at the 7th meeting which were included in the very good category.

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