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Development of Adobe Flash CS6 Learning Media with Contextual Teaching and Learning Approach on The Topic of Environmental Pollution

Nabila Rizky Amalia[1] , Rosita Fitrah Dewi[1*]
[1] Tadris Biologi, FTIK, UIN Kiai Haji Achmad Siddiq Jember, Jawa Timur, Indonesia
[*]E-mail: rositafitrah@gmail.com

Abstract

The contextual approach in biology learning process emphasizes on understanding concepts related to phenomena that occur around students. Moreover, the concepts of environmental pollution really needs real examples so that students can easily understand the concepts. This study aims to describe the development and validity of adobe flash CS6 professional-based learning media using a contextual teaching and learning (CTL) approach in the topic of environmental pollution for students in class X at MAN 1 Pasuruan. This research is included in a development research using the ADDIE model (Analysis, Design, Development, Implementation and Evaluation). The results of product validation from material experts, media experts, and biology teachers obtained an overall average percentage of 95%. According to the findings, it can be concluded that the learning media is very valid which can be used in the biology learning process.

Keywords: Adobe Flash CS6, CTL approach, Environmental pollution, Learning media.

INTRODUCTION

Teachers have a big role in the learning process, in which teacher becomes a role model so that teachers must have one of four competencies, namely personal competence. Personal competence is very important to engaged by teachers because students are easy to imitate what teachers act and do (Siagian, 2021: 7).

In addition, teachers have other roles, namely as a motivator, class manager, mediator, facilitator, demonstrator, evaluator and administrator. Teachers must prepare each component in carrying out teaching and learning activities, one the other is to prepare learning media that support the teaching and learning process (Sanjani, 2020: 37).

Learning media is one of the most important components in learning process, so that the material can be conveyed properly and can be understood by students easily, so from this it can be said that learning media have become the basic needs of teachers and students, with easy delivery and understanding of the material, the learning objectives can be achieved. well. The use of learning media during the learning process makes students more interested and eliminates boredom and boredom during the teaching and learning process (Anggraini et al, 2019: 86).

The learning that students need today is learning that is able to facilitate the characteristics of students and make

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students active. The curriculum used by schools gradually since 2013 is the 2013 curriculum which is based on competence and character. The 2013 curriculum changes the pattern of orientation education to process education using a contextual teaching and learning (CTL) approach (Aji et al, 2015: 78).

Contextual teaching and learning (CTL) is an educational approach that is different from others because CTL leads students to combine academic subjects with the student's own circumstances, which CTL involves the role of students to find their own context or meaning. The CTL approach also makes students understand the responsibility that humans have on the environment, be it the family, work and community environment or the ecosystem (Johnson, 2014: 66).

One of the learning media that can be used to bridge the facts in the field with the learning process in the classroom that is in accordance with the CTL concept is Adobe flash. Adobe flash usually used to develop interactive learning multimedia or what is called MPI. This is because Adobe Flash is able to create and support images, text, animation, audio, video and so on. The ability of Adobe Flash is indeed very capable because it can create an animation from simple to complex. With this Adobe Flash, you can combine animation, text, or audio into an interesting learning media (Sipayung et al, 2020: 60).

Adobe flash is a software used to create animations accompanied by video, images, audio. In addition, the flash file size can be smaller after publishing, flash can also import various types of files, both image files, video files or audio files and also flash can also produce files in exe form so that from this, flash can be run on a computer. or a laptop without having to install a flash program first (Rahmaibu, 2016: 3).

MAN 1 Pasuruan is a school whose mission is to organize a conducive learning program supported by adequate infrastructure and to equip students with basic IT and multimedia skills. According to the biology subject teacher, during biology learning, especially environmental pollution material, it is necessary to present real examples of the concept of pollution with conditions in the real world. However, the learning media in schools are still limited to textbooks and videos on YouTube which require a lot of quota. Direct learning process in the field is also not possible because it is too risky and requires special preparation that requires a lot of resources and manpower.

Based on the overview above, it is necessary to carry out a research to develop a professional adobe flash CS6-based learning media using a contextual teaching and learning (CTL) approach in the topic of environmental pollution for students of tenth-grade at MAN 1 Pasuruan in which this media can make students to understand biology easily. In addition, it is also supported by the condition in which students also have the ability to operate technology such as Adobe Flash CS6 Professional because the school have IT-based programs. With the development of the media supported by text, images,

audio and animation and video which is packaged into an attractive learning media, it is expected that it can help and increase students' learning motivation.

The aims of this research are: 1.) To describe the development of adobe flash CS6 professional-based learning media using contextual teaching and learning (CTL) approach in the topic of environmental pollution for students at MAN 1 Pasuruan and 2.) To describe the validity of adobe flash CS6 professional-based learning media using a contextual teaching and learning (CTL) approach in the topic of environmental pollution.

METHOD

The research is included in the type of research and development (R&D) using the ADDIE development model which consists of 5 stages namely Analysis, Design, Development, Implementation, and Evaluation. The stages in the research are as follows:

a. Analyze

The analysis phase begins with finding information related to the causes of learning problems, this is done by conducting a performance analysis and needs analysis. Performance analysis was conducted to find out and clarify the problems experienced during the learning process at MAN 1 Pasuruan such as the feeling of boredom and boredom of students during learning related to the learning media used. A needs analysis is carried out to determine the abilities or competencies that students need to learn (Panggabean and Amir, 2020: 69).

b. Design

In the second stage, namely designing, what is done is compiling tests based on the learning objectives that have been formulated, then developing appropriate media learning strategies and also having to consider supporting sources for learning such as relevant learning resources, both with learning and learning objectives (Hamzah , 2019: 33).

c. Development

At this stage, production and revision of the developed learning media products are conducted. The product is then validated by a team of experts using a validation instrument in the form of a questionnaire. The expert team consisted of three media expert lecturers, three biology lecturers as material experts, and a biology teacher at MAN 1 Pasuruan as user validators. After the product is validated, it is revised according to the evaluation and suggestions of the validators.

Quantitative data was obtained based on the results of the validator's questionnaire, while for qualitative data in the form of criticism and suggestions obtained from the validator on the product developed. The results of the analysis of quantitative and qualitative data from the developed learning media are used to describe the validity of the product. The data were analyzed descriptively qualitatively and quantitatively using the percentage formula adapted from Akbar (2013: 83) as follows:

- Data analysis from Expert validation

$$V - ah = \frac{Tse}{Tsh} x100\%$$

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- Data analysis from biology teacher

$$V - pg = \frac{Tse}{Tsh} x100\%$$

Note:
V-ah = expert validation
T-pg = user validation
Tse = total empirical score achieved based on expert assessment
Tsh = Total expected score

After reach the percentage, then the score is changed according to the criteria for the validity of the learning media which can be seen in the following table 1.

Tabel 1. Criteria for Rating Scale

Criteria	Validity
81% - 100%	Very valid, can be used without any revisions
61% - 80%	Valid, can be used but requires major revision
41% - 60%	Valid, can be used but requires minor revision
21% - 40%	Invalid, it is recommended that it is not used because it requires many revisions
0% - 20%	Invalid, may not be used

(Akbar, 2013:42)

The ADDIE stages carried out are only limited to the development because at the time the research was conducted, schools were still implementing an online learning system due to the Covid-19 pandemic.

RESULT AND DISCUSSION

The development model used in this research is the ADDIE model (analysis, design, development, implementation and evaluation). The development is carried out through several stages.

a. Analyze

At the analysis stage, interviews were conducted with biology teachers at MAN 1 Pasuruan and distributing questionnaires to 27 students of class X MIA 2 through google form. This class was used as a research sample because based on the results of the analysis of student characteristics, X MIA 2 students were easier to understand the learning material if the biology material used was delivered is related to everyday life and is assisted by illustrations, pictures or sounds. Students also like learning media by using information technology media because it is more interactive.

Based on the analysis of student needs, online learning implemented in schools resulted in around 74.1% of students complaining because online learning consumes a lot of internet quota, 96.3% of students said it was easier to understand biology material if it was associated with examples in everyday life. Explanations from biology books used by students are difficult to understand because of the many confusing words and unattractive pictures. This makes students lazy to study. In delivering the material the teacher uses voice notes through the whatsapp group, so that biology learning tends to be monotonous. In addition, as many as 88.9% of students said it was easier to understand the material if the biology material was delivered with the help of image and sound illustrations and students were more fond of multimedia.

Based on the results of interviews with biology teachers, environmental pollution material requires the environment as its subject. However, what is currently happening is still in a pandemic situation, so it is not possible to instruct students to observe environmental pollution around schools because the online system is still

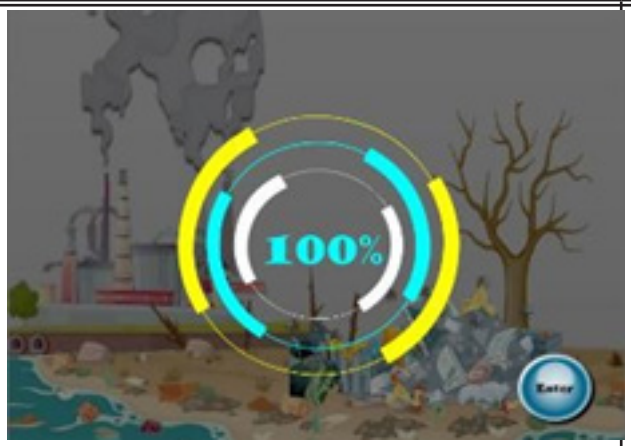
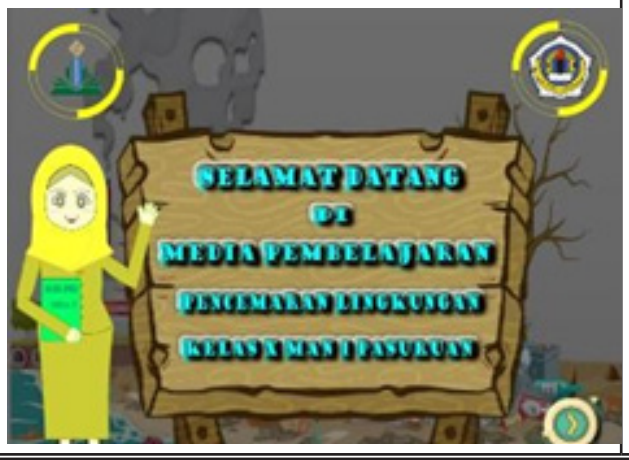
being implemented and is too risky and ineffective. In their learning, the teacher uses learning resources from books and the internet as well as assignments given to students in the form of assessment which contains materials and assignments such as students' worksheets.

In carrying out practical activities during a pandemic like this, students are still unable to carry out practical activities so the teacher conveys the need for learning media that can support the biology learning process which includes material, practice questions and practicum.

b. Design

At the design stage, the product is designed by incorporating prepared materials into Adobe Flash CS6 professional software such as typing materials, creating animations, importing audio or images and creating loading pages, compiling learning media concepts using the CTL approach, making practice questions, choose the type, size and color of the font, make the teacher speak animation and choose the appropriate color gradation for the design of learning media. Each scene is made as attractive as possible so that learning is not boring, then the developer makes navigation buttons to make it easier for users when operating learning media. The design of the developed learning media products can be seen in table 2.

Tabel 2. Adobe Flash CS6 Media Design

No	Page View	Description
1		Making this loading page is made to attract students' attention to the initial appearance of the learning media.
2		Welcome page so that users know the material to be discussed

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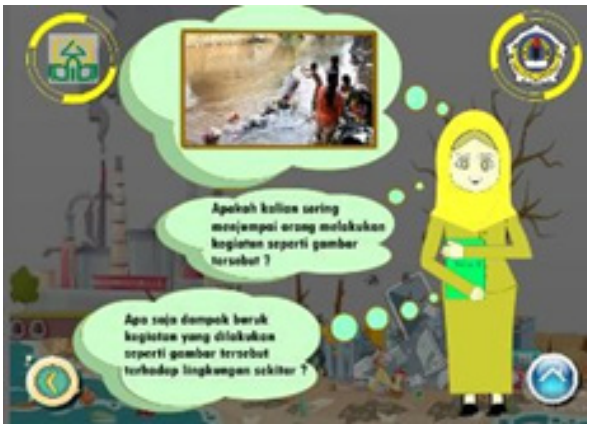
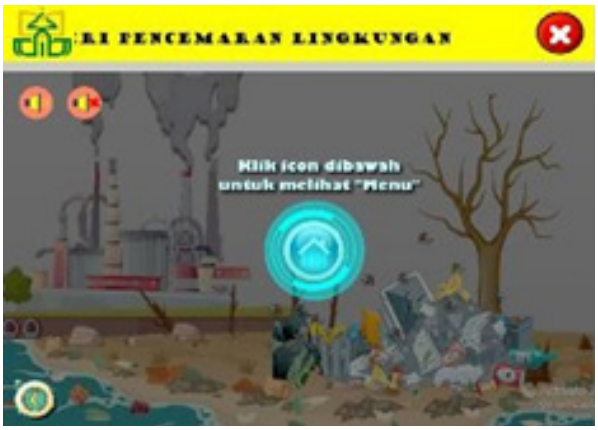
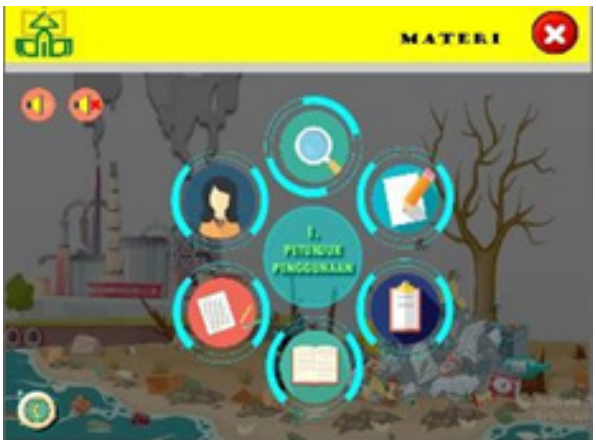
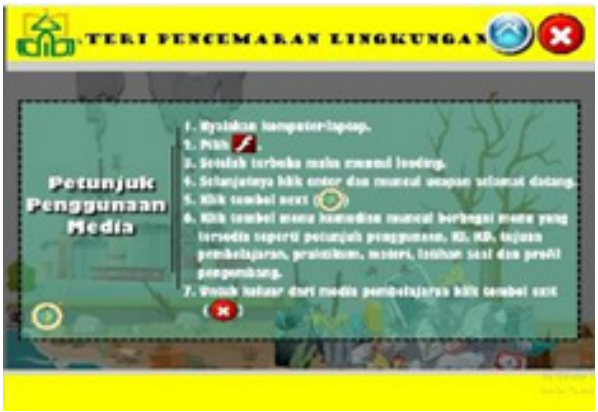
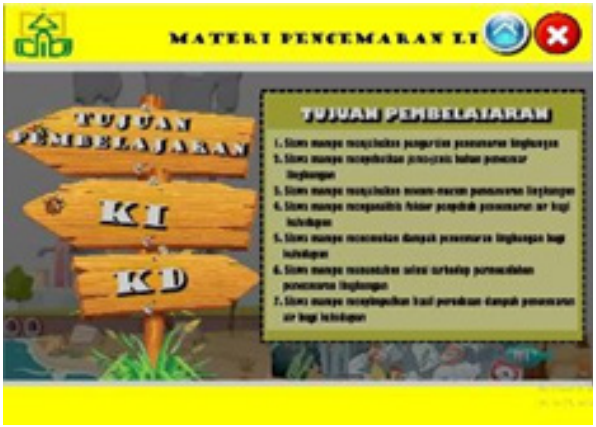
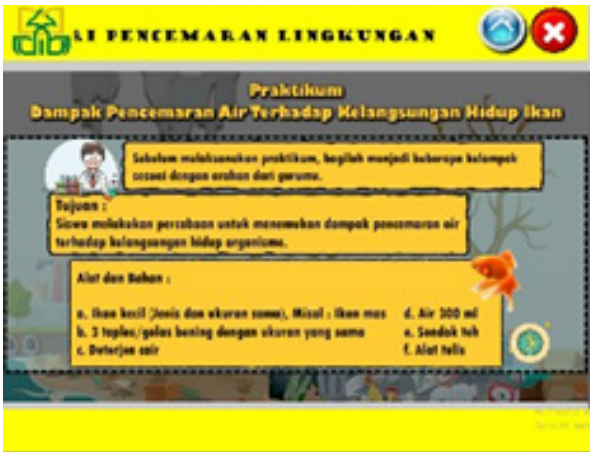
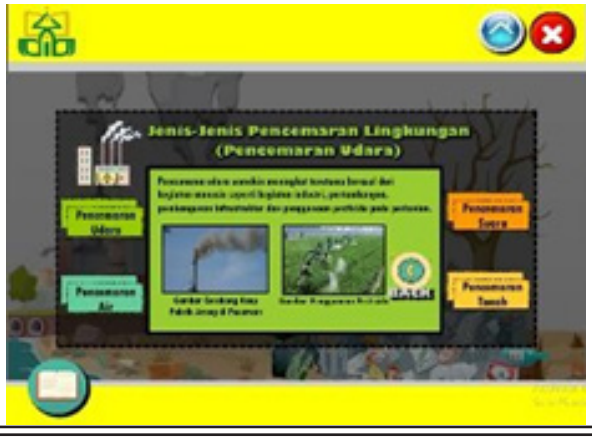
No	Page View	Description
3		On this page, students are presented with pictures so that they can relate their knowledge to the learning material. Students are also asked questions to stimulate students' thinking..
4		Instruction page for instructional media operation
5		Menu page, which consists of instructions for use, learning objectives, core competencies, basic competencies, practicum, materials, practice questions and discussions as well as developer profiles
6		

No	Page View	Description
7		Learning objectives page, core competencies and basic competencies
8		Instructions for students to do practical work on the impact of pollution on fish survival. After completing the practicum students work on the provided LKPD
9	 	The page contains sub menus of materials such as the definition of environmental pollution, types of environmental pollution, data on environmental changes, environmental pollutants, the impact of environmental pollution, handling of environmental pollution and videos on environmental pollution.

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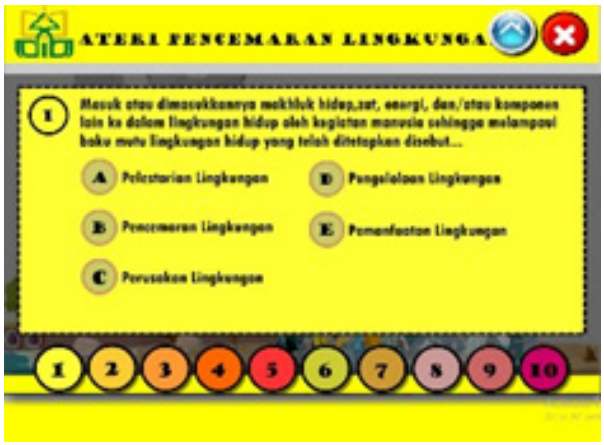
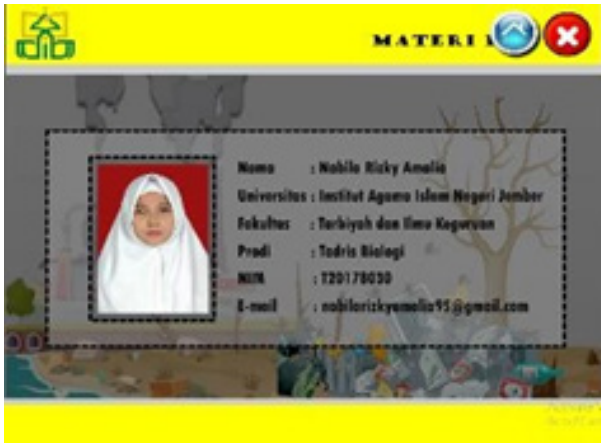
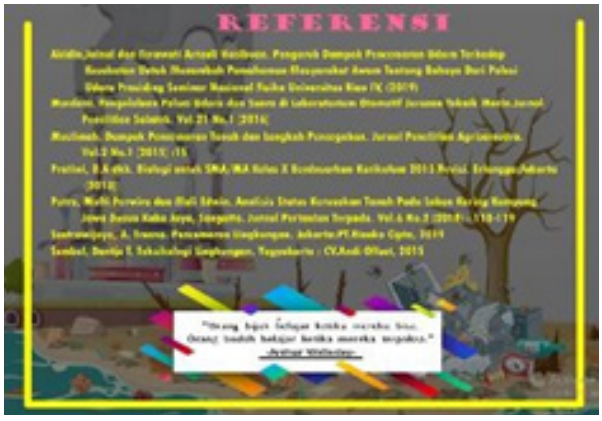
No	Page View	Description
10		Student worksheet
11		Developer
12		Reference and motivational word

The learning media products made have pictures and audio containing materials that contain explanations about various types of environmental pollution. The advantage of this media is that the material presented is representative of the real conditions in the field regarding environmental pollution and contains practical instructions regarding pollution of the aquatic environment and its impact on biota in the waters.

Another advantage of this media is that it can be used offline (no internet connection required) so that students can study independently without worrying about the internet.

c. Development

After the learning media product has been

made, then the learning media validation is carried out by a validator consisting of material expert validators namely Bayu Sandika, M.Si (Validator I), Wiwin Maisyaroh, M.Sc (Validator II), Nanda Eska Anugrah Nasution, M.Pd (Validator III) and media expert validators, namely Husni Mubarok, S.Pd., M.Si (Validator IV), Dr. A. Suhardi, M.Pd (Validator V), Heni Setyawati, M.Pd (Validator VI) and a biology teacher at MAN 1 Pasuruan, namely Dra. Dwi Prasetyawati, MMPd. Based on the validation results, the overall assessment data obtained from each validator can be seen in table 3.

Tabel 3. Overall Rating Data From Every Validator

Validator	Average	Validity
Theory Expert	93.48%	Very Valid
Media Expert	93.97%	Very Valid
Biology Teacher	95.82%	Very Valid
Average	95.82%	Very Valid

The results of material validation obtained an average overall percentage of material expert validation results of 93.49% and media validation results obtained an average overall percentage of media expert validation results of 93.97% while the results of biology teacher validation obtained an average percentage of overall results Biology teacher user validation is 100%. So, it can be seen that the overall percentage average is 95.82% with a very valid level of validity which indicates that the resulting product can be used without revision.

However, the validator's suggestions are explained in the table 4 below.

Tabel 4. Suggestions from Validator

Validator	Suggestions
Theory Expert	• Adjust the definition of pollution to be consistent with Law no. 32 of 2009 concerning the environment • For detergent practicum on fish, use a lower dose (between 0-200 ppm) with an observation time of 3 days
Media Expert	• Switching between menus is pulled back on the menu that has the option • Replace the introductory image with "people taking out the trash" • Glasses are labeled • Correction of numbering on worksheet • The display on the water pollution impact material should have a "back" sign • For practice questions, it's better to distinguish between true and false
Biology Teacher	• No Suggestion

The final media product has been revised based on suggestions from the validator. In the final stage of product revision, a product is obtained that can be used as a medium for teaching biology for teachers and can be used by students to study independently at home.

CONCLUSION

Development of Professional Adobe Flash CS6-based learning media with a CTL approach on the topic of environmental pollution is carried out through several stages of ADDIE, including the analysis phase which consists of performance analysis and needs analysis. Performance analysis is carried out to identify and

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determine the performance problems experienced and then perform a needs analysis by determining the capabilities and competencies. The next stage is the design stage, which is carried out by designing the developed product. Then carry out the development stage which is carried out by realizing the design that has been designed into a reality using professional Adobe Flash CS6 software and validating the expert team to determine the validity of the product being developed.The average of the total assessments of the validators is 95.82%, so it can be concluded that the validation results from material experts, media experts and biology teachers show that professional adobe flash CS6-based learning media on environmental pollution topic is very valid and can be used without revision.

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BRIEF PROFILE

The first author named Nabila Rizky Amalia was born in Pasuruan on June 26, 1998. A student of the Biology Study Program, FTIK UIN KHAS Jember, entered the 2017 class and graduated in 2021. The second author is Rosita Fitrah Dewi S.Pd., M.Sc. as Lecturer of FTIK IAIN Jember who is still actively teaching at Tadris Biology, FTIK UIN KHAS Jember