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Development of Guided Inquiry-Based Digestive System Teaching Materials to Improve Critical Thinking and Scientific Attitudes

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Abstract

Difficulty in understanding the material and the decline in student learning outcomes can be managed by developing teaching materials tailored to the needs of students. This study aims to develop guided inquiry-based digestive system teaching materials as a source of student learning to improve student's critical thinking and scientific attitude. The method used in this research is the Research and Development (R&D) with the steps used are: 1) Identify potential and problems; 2) collecting data; 3) product design; 4) design validation; 5) main product revision design; 6) small-scale trial; 7) second product revision; 8) wide-scale test; 9) product revision; 10) final product. Class Students research subjects XI MIPA 4 and XI MIPA 5 SMAN 5 Cirebon with 60 students as subject. The results showed: (1) guided inquiry-based teaching material products developed based on the guided inquiry syntax; (2) the validity of teaching materials based on the validation scores of material and media experts, respectively 95% and 96.25% with very valid criteria; (3) guided inquiry-based teaching materials based on results of the analysis of the description test and the analysis of the scientific attitude assessment question, it shows that teaching material effectively improve the learning outcomes of student's critical thinking and scientific attitude. Based on the results of the study, it can be concluded that the digestive system teaching materials developed have characteristics based on the guided inquiry syntax, including: formulate the problem, make a hypothesis, planning an experiment, collecting data and conclusion, very valid and effective teaching materials improve critical thinking and scientific attitude of students.

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INTRODUCTION

Learning activities in the 21st century require students to have various abilities that must be managed in learning, and it's hoped that students will be successful in the future. One of the skills that must be possessed in 21st-century learning is critical thinking (Bensley & Spero, 2014). Critical thinking is a disciplined activity to evaluate arguments or propositions and make judgments that can help develop beliefs and take action (Geçit & Akarsu, 2017).

Biology learning concepts can be conveyed optimally and are related to everyday life or contextually, which require students to have critical thinking skills and need improvement. Mandatory efforts in enhancing students' critical thinking skills are to find learning resources, namely a kind of teaching material. Learning resources such as teaching materials can contribute well in helping students understand the material (Lau et al., 2017).

A study on Indonesian student learning outcomes through Trends in International Mathematics and Science Study (TIMSS) shows that Indonesian student learning outcomes are in the weak category. The latest TIMSS results that measure ability in mathematics and science show Indonesia is ranked 44th out of 49 countries (Nizam, 2016). Student's higher-order thinking skills are still low such as analyzing, problem-solving, and evaluating.

Low critical thinking skills also occur in schools. Based on the results of observations and interviews with biology teachers at schools, data were obtained that students had difficulty understanding biology material, and the value of biology learning outcomes had not yet reached the KKM value. Completeness student in achievement competence digestive system matter less than 75%. The minimum completeness criteria value at the school for biology subjects is 75. Students have not been able to develop the ability to analyze or solve a problem. This can be seen when in learning, there are still many students who have difficulty solving problems to make conclusions. This indicates that student's critical thinking skills and scientific attitudes are still low. The effort to improve student's critical thinking is problem-based learning can improve critical thinking skills (Muhammad, 2017). Not only that, problem-based learning can improve student's scientific attitude skills (Wijaya et al., 2018). Not only that, the teaching materials found are mainly in the body systems chapter, the sub-chapter of disorders or material loading disorders shorter. The teaching materials haven't been applied, for example, contextual problems. Based on the above background, this study aims to develop guided inquiry-based digestive system teaching materials as a source of student learning to improve critical thinking and scientific attitude. The developed teaching materials can use as complementary books related to the student textbooks used haven't included examples about problems that occur every day.

METHOD

This research and development using a model Sugiyono (2010). The development flow consists of ten stages: identifying potential and problems; collecting data; product design; design validation; main product revision design; small-scale trial; second product revision; wide-scale test (implementation in learning); product revision; final product. This research was implemented in State Senior High School 5 Cirebon in the even semester of the school year 2020/2021. The sample was selected by random sampling with 30 students in the experimental class and 30 students in the control class. The experimental class was treated by conducting learning using teaching materials based on guided inquiry, while the control class was conducted by learning using textbooks.

The data in this study include data on the validity of teaching materials obtained through a material and media validation questionnaire given to expert lecturers in the field of materials and media. Data readability of teaching material was obtained through a questionnaire response to students and teachers. Data effective of teaching material obtained from the result of pretest and posttest with essay question amounted to 20 questions to measure student's critical thinking skills with indicators providing simple explanations, building basic skill, and concluding, tested on 30 students of class XI MIPA 4 as the experimental class and 30 class students XI MIPA 5 as control class, improvement of learning outcomes and classical completeness. Data analysis of students scientific attitude with assessment questionnaires. Data analysis using N-

gain, prerequisite test (normality and homogeneity test), and t-test. Data analysis of student's scientific attitudes using an assessment questionnaire with curiosity, objective, critical attitude, openness, and tolerance indicators.

RESULT AND DISCUSSION

Validity of Guided inquiry-Based Digestive System Teaching Materials

The results of the validation material expert and media expert on the development of guided inquiry-based teaching materials can see in table 1.

Table 1. Validation of Teaching Materials Expert Materials and Media Expert

Validator	Component			Percentage	Criteria
	Content	Material Presentation	Language		
Material expert	95	97	87.5	95%	Very Valid
Media expert	97.5	97	87.5	96.25%	Very Valid
Average				95%	Very Valid

A material expert's validity of teaching materials shows the validation results of all aspects assessed starting from the material's content, material presentation, and language obtained results with very valid criteria. Material experts assess that the display of teaching materials can make grow enthusiasm and interest in student learning. This is because material developed has been adapted to the problems that occur in everyday life to increase high curiosity. Teaching material presents actual material based on cases sourced from journals and relevant research results. This is in line with Purwanto & Rizki (2015); Kususa et al. (2017) state that the material associated with problems in a student's environment can increase interest or attention to create effective learning.

The second validation, the media expert validator, shows the validation results of all aspects considered to be obtained with very valid criteria and can be used in learning with improvements. This is because the presentation of teaching materials follows the sequence of concepts and is equipped with pictures to make students understand the concept. Presentation of text illustrations, pictures tables by the material and completed with reference sources. This is appropriate with Arlitasari et al. (2013) stating that presenting interesting teaching materials in terms of material, images, and writing can increase student readability in learning and understanding. This follows the results of the study of Ariani et al. (2018); Sutiani & Maisyarah (2021), which states that guided inquiry-based teaching materials are appropriate to improve students' critical thinking seen from the acquisition of validation results.

The validator's suggestions in developing guided inquiry-based teaching materials are as follows: 1) there is a typing error in the preface; 2) a picture of someone, preferably a self-portrait with a known model; 3) for pictures of food that the photos themselves can take; 4) there is a spacing that is not consistent, so it needs repairs to make it look presentable. By the validator's suggestion, some incorrect words were correct, and images that were not suitable replace with other photos that matched real life.

The teacher's responses to the developed teaching materials used to support the validity of developed teaching materials. The teacher's response to the developed teaching materials is presented in Table 2 below:

Table 2. Results of Teacher Responses to The Development of Guided Inquiry-Based Teaching Materials on Digestive System Materials

Aspect	Number	Max Score	Percentage	Criteria
Legibility	19	20	95%	Very Valid
Attractive	7	8	87.5%	Very Valid
Presentation	11	12	91.7%	Very Valid
Average			91.4%	Very Valid

The results of biology teachers' responses in schools are shown in table 2, which shows that the results are very valid. This is because the teaching materials developed throughout the text are clear and easy for students to read. The teaching materials are interesting because they emphasize concept discovery. This is in line with research by Cahyaningrum *et al.* (2017), which states that the module is feasible to use in learning is a module that is developed to the needs of students and teachers and uses language that students easily understand.

Student responses were obtained from a response questionnaire containing questions given to see the readability of the developed teaching materials the results of student responses to the development of teaching materials are present in table 3.

Table 3. Results of Students Response Question Analysis on The Development of Teaching Materials

Aspect	Number	Max Score	Percentage	Criteria
Attractive	134	160	83.8%	Very Good
Legibility	100	120	83.3%	Very Good
Easiness	100	120	83.3%	Very Good
Average			83.5 %	Very Good

Table 3 shows the results of student responses to the attractiveness aspect of teaching material, and the criteria are very good. This is because the teaching materials developed are attractive designs. The teaching materials developed are considered interesting because they are equipped with pictures that match the material to attract students' interest in learning. This is in line with research Septiani *et al.* (2013); Purnomo *et al.* (2013) state that teaching materials that are attractively designed and equipped with pictures or examples will not seem monotonous to attract students interested in learning.

Student responses to the use of guided inquiry-based teaching materials that have been developed are easy to understand. This is because the language component of guided inquiry-based teaching materials according to student responses, the language used in the teaching materials is easy to understand, and the material presented uses precise language. Guided inquiry-based teaching materials can help students understand and practice critical thinking because questions practice critical thinking. This is in line with research Syafi'I *et al*. (2016); Sari *et al.* (2016) stated that the module developed with questions could improve students' critical thinking skills.

The Effectiveness of Guided Inquiry-Based Teaching Materials

After the validation stage has done, it was continued with field trials to determine the effectiveness of developing guided inquiry-based teaching materials. The field trial used two classes that are the experimental class and the control class. Field trials were conducted by giving pretest and posttest to two classes: the experimental class and the control class to see the students' critical thinking learning outcomes on the digestive system material. Posttest results are referred to as student cognitive learning outcomes. Differences in students' cognitive learning outcomes in learning the digestive system material using guided inquiry-based teaching materials are presented in table 4 below:

Table 4: Results of Analysis of Differences in Student Cognitive Learning Outcomes (Critical Thinking)

Class	Description	Pretest Scores	Posttest Scores
Experiment	The highest score	55	85
	Lowest value	39	73
	Average	48.4	79
Control	The highest score	53.8	77.5
	Lowest value	41.3	62.5
	Average	50.2	72.9

After knowing the pretest and posttest results, the data then analyze using the Independent sample t-test test to determine the effectiveness of teaching materials. The students' critical thinking learning outcomes were tested on the t-test to examine whether there was a significant difference between the experimental and control classes. The learning outcomes data were tested for normality and homogeneity as prerequisites for the t-test. The results of the t-test are presented in Table 5 below:

Table 5. t-test Results Differences in Student Cognitive Learning Outcomes (Critical Thinking)

Data	Class	Statistical Test Type	Value Sig. 2 tailed	Description
learning outcomes	Experiment Control	t-test	0.000	Significantly different

Table 5 shows the t-test results that there are differences in critical thinking learning outcomes between experimental class students and control class students with Sig < 0.05. This is because the teaching materials developed are based on the guided inquiry syntax to motivate students to study independently and improve their learning outcomes. This is in line with Mashur *et al*. (2018) research, which states that learning using guided inquiry-based teaching materials can improve students' cognitive learning outcomes.

The N-gain test was conducted to determine the great increase in student learning outcomes in learning the digestive system material using guided inquiry-based teaching materials. The results of the N-gain test are presented in Table 6 below:

Table 6. N-gain test data results

N	Class	N-Gain Category Percentage (%)	
		Hight	Medium
30	Experiment	19	11
30	Control	0	30

The experimental class N-gain test results are better than the control class. This shows that learning using guided inquiry-based teaching materials increases better learning outcomes. The problems are presented in the form of discussion questions that contain problems that occur in everyday life. Discussion questions contain questions that trigger students' curiosity and interest. The discussion process makes it easier for students to understand the material that is difficult to understand. This is in line with research Malmia *et al.* (2019) states that learning that presents contextual problems effectively improves students' understanding and learning outcomes. In addition, because learning using guided inquiry-based teaching materials raises student enthusiasm, learning is student-centered learning, which has the advantage of making it easier for students to understand concepts. This is in line with results Ikhsan (2016) stated that learning using guided inquiry-based modules could help students improve learning outcomes and help students understand concepts. Learning using guided inquiry-based teaching materials can stimulate students in classroom learning to be more interested in following it and can form ideas that can build

students' critical thinking skills. Fatmasary & Supriyanto (2015); Marisa (2018) stated that learning using guided inquiry-based teaching materials could stimulate student learning with scientific activities that improve critical thinking skills.

The success of learning by applying guided inquiry-based teaching materials on digestive system materials is evidenced by cognitive learning outcomes reaching indicators. Classical completeness class 75% with KKM of 75. The results of classical Completeness are presented in Table 7:

Table 7. Results of Student Classical Completeness Analysis

Class	Description	Pretest Scores	Posttest Scores
Experiment	The highest score	55	85
	Lowest value	39	73
	Average	48.4	79
	Student completed	1	27
	Student not completed	29	3
	Classical Completeness (%)	3.3	90
Control	The highest score	53.8	77.5
	Lowest value	41.3	62.5
	Average	50.2	72.9
	Student completed	1	10
	Student not completed	29	20
	Classical Completeness (%)	3.3	33

Table 7 shows that the classical Completeness of the experimental class has been achieved, while the control class has not. Classical Completeness in the experimental class was higher at 90%, when compared to the control class, the results of classical Completeness were 33%. This is because the experimental class uses guided inquiry-based teaching materials. These results indicate that learning by applying guided inquiry-based teaching materials is effectively applied in learning. It has also supported Hakim et al. (2020) stated that the development of guided inquiry-based teaching materials is very valid, practical, and effective in improving student learning outcomes. This is also supported by research Rohmiyati et al. (2016) states that learning with the guided inquiry module is more effective in improving learning outcomes compared to LKS in schools.

Based on the analysis of students' classical completeness results, some students have not yet completed achieving the KKM score, even though they have received the same treatment. This can be caused by several factors, including student's lack of focus when learning takes place, learning activities, and student interest in learning that can affect student learning outcomes. This can see from their active activities, but their learning outcomes are still not optimal or have not met the KKM. This can be influenced by various factors such as family, school, environmental and psychological factors that affect student learning, especially during the Covid-19 pandemic (Wijaya & Bukhori, 2017; Onyema et al., 2020).

The effective assessment aims to improve students' scientific attitudes during the learning process by using guided inquiry-based teaching materials. The observed scientific attitude consists of 5 indicators used in this study, including 1) Students' curiosity by asking questions, 2) Objective/honest, is reporting the results of observations and answering questions, 3) critical thinking attitude, is seeking clarity of statements or questions, 4) open, is willing to exchange ideas and 5) tolerant, is respecting other people's opinions. Other. The recapitulation of students' scientific assessment results is present in Table 8.

Table 8. Results of Student Scientific Attitude Analysis

Indicator	The first meeting		The second meeting		The last meeting	
	Experiment	Control	Experiment	Control	Experiment	Control
1	60	53	86	55	93	60
2	75.5	65	86.5	67.5	88	62.5
3	78	62	85	70	88	73
4	68	65	78	68	78	73
5	83	76	86	76	92	76
Average (%)	72.9	64.2	83.75	67.25	87.8	70.5
Category	High	High	Very High	High	Very High	High

Table 8 shows that applying guided inquiry-based teaching materials can positively improve students' effectiveness, primarily scientific attitudes. The results of students' scientific attitudes are the highest on the indicator of curiosity by asking questions. Students are very interested and enthusiastic in participating in learning activities by applying guided inquiry-based teaching materials that improve their scientific attitude. The average effective learning outcomes of students' scientific attitudes in the high category, and this is because students who from the beginning of learning learn and see information independently, so that during the learning process in class students are more appreciative, draw conclusions according to facts, actively ask questions, express opinions, and record observations in full.

The result of increasing scientific attitude in the control class shows that the scientific attitude in the control class in each meeting has increased less than the experimental class because the control class does not use innovative teaching materials based on guided inquiry. Guided inquiry-based teaching materials make students active in learning to improve scientific attitudes. This is in line with research Setiawati et al. (2013); Puti, S & Jumadi (2015) state that learning using guided inquiry-based teaching materials can improve students' scientific attitude skills.

The improvement of effective learning outcomes of scientific attitudes is influenced by many factors, one of which is student-centered learning, which trains students to be more active in fostering scientific attitudes. This is following Maresatasri et al. (2012) state that many factors influence students' scientific attitudes, but by using student-centered learning, students' scientific attitudes have increased significantly. Scientific attitude skills are one of the factors that influence the improvement of student learning outcomes. Scientific attitudes such as curiosity, respect for data or facts, and an open mind and cooperation in research and solving problems maximize learning outcomes (Sa'adah & Kusasi, 2017).

Characteristics of Digestive System Teaching Materials Based on Guided Inquiry

The product developed is a guided inquiry model-based biology teaching material. The curriculum used in this study is the 2013 Curriculum. Teaching materials are made based on the guided inquiry syntax, that is, formulating problems, making hypotheses, designing experiments, conducting experiments, collecting data and analyzing, and making conclusions. The teaching materials developed are based on guided inquiry on the material of the digestive system characteristics of guided inquiry-based teaching materials based on procedural Sugiyono (2010), which has ten stages. Guided inquiry-based teaching materials require students to be actively involved in the learning process to connect new ideas with students' knowledge.

Guided inquiry-based digestive system teaching materials are different from books or learning companion modules in general because they are equipped with scientific activities and guided inquiry syntax to improve critical thinking and grow their scientific attitude. Critical thinking indicators used 1) simple explanation; 2) building basic skills; 3) conclude. Indicators of scientific attitude used are: 1) Students' curiosity by asking questions, 2) Objective/honest, is a reporting the results of observations and answers about, 3) critical attitude assessment, is a finding offers or questions, 4) being open to exchanging ideas and 5) tolerance, is a respecting the opinions of others. The following

are teaching materials developed based on guided inquiry syntax (Figure 2-6).

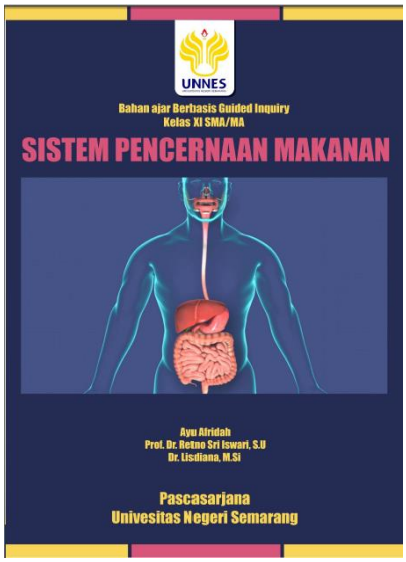

Figure 1. Guided inquiry based teaching materials

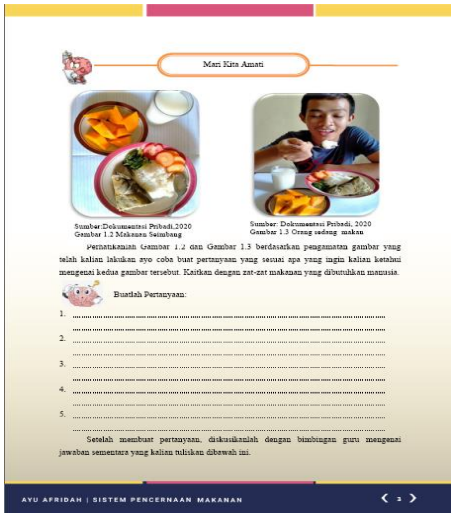

Figure 2. Stage of formulating the problem

Figure 3. Stage of making hypothesis

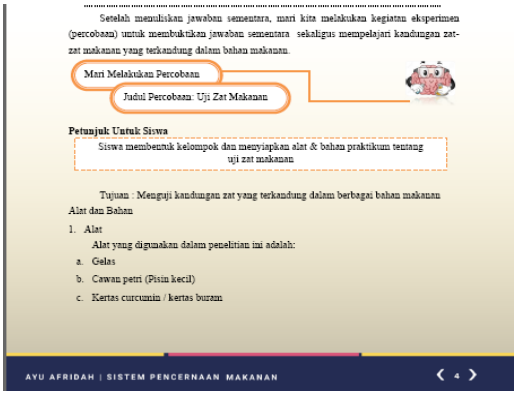

Figure 4. Stage of conducting experiments (practicum)

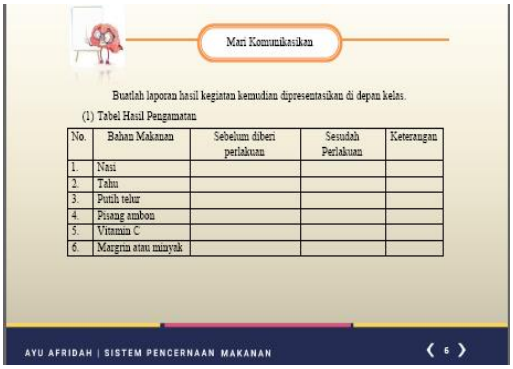

Figure 5. Communicating stage

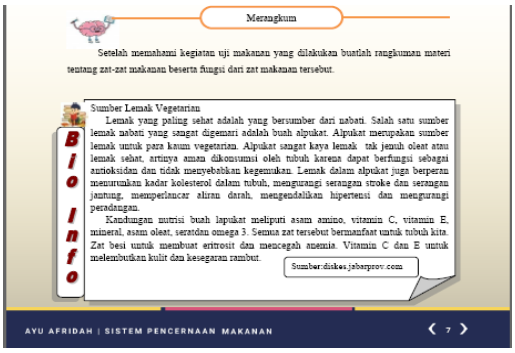

Figure 6. Conclusion stage

The advantages of guided inquiry can train students to design, develop and conduct experiments, collect data, analyze, and make conclusions to understand the concept. The sub-subjects of the specific digestive system are on KD 3.7 Analyze the relationship between the structure of the tissues that make up the organs in the digestive system and relate it to nutrients and their bioprocesses so that they can explain the process of the human digestive system; 4.7 Presenting the results of an analysis of abnormalities in the structure and function of tissues in the digestive organs that cause disturbances in the human digestive system

through various forms of media and presentations. KD analysis on the material system aims to determine indicators and learning objectives. The indicators used to develop learning objectives have adapted to aspects of knowledge, attitudes, and skills. Learning by using guided inquiry-based teaching materials raises student enthusiasm so that learning is student-centered learning which has the advantage of making it easier for students to understand independent and contextual concepts This is in line with research Putra, (2017); Ramdani (2018) states that learning with contextual-based media can help students reflect on learning with everyday life to improve understanding and learning outcomes.

CONCLUSION

Based on the research results that have been done, it can be concluded that the teaching materials for the digestive system based on guided inquiry are very valid and effective in improving student's critical thinking and scientific attitude.

REFERENCES

Ariani, N. D., Masykuri, M., & Suparmi, S. (2018). Pengembangan Modul Fisika SMA/MA Kelas X Berbasis inkuiri Terbimbing pada Materi Listrik Dinamis untuk Meningkatkan Kemampuan Berpikir Kritis Siswa. *Jurnal Inkuiri* vol 7 (1).

Arlitasari, O., Pujayanto, & Budiharti, R. (2013). Pengembangan Bahan Ajar IPA Terpadu Berbasis Salingtemas dengan Tema Biomassa Sumber Energi Alternatif Terbarukan. *Jurnal Pendidikan Fisika*, 1 (1): 81-89.

Bensley, D.A., & Spero, R. A. (2014). Improving Critical Thinking Skills and Metacognitive Monitoring Through Direct Infusion. *Thinkhing Skills and Creativity*, 12, 55-68.

Cahyaningrum, R. D., Nurjayadi, M & Rahman, A. (2017). Pengembangan E-Module Kimia Berbasis POGIL (Process Oriented Guided Inquiry Learning) pada Materi Reaksi Reduksi-Oksidasi sebagai Sumber Belajar Siswa. *JRPK: Jurnal Riset Pendidikan Kimia*, Vol. 7 No.1 hal 59-65.

Fatmasary, A & Supriyanto (2015). Pengembangan Lks Praktikum Identifikasi Proses Pencernaan Hewan Ruminansia Berbasis *Guided Inquiry* Di SMA. *Unnes Journal Of Biology Education. 4(1) 1 – 8.*

Geçit, Y., & Akarsu, A. H. (2017). Critical Thinking Tendencies of Geography Teacher Candidates in Turkey. *Universal Journal of Educational Research* 5(8), 1362-2371.

Hakim, A. R., Ramdani, A., & Setiadi, D. (2020). Bahan Ajar Biologi Berbasis Inkuiri Terbimbing Untuk Meningkatkan Hasil Belajar Peserta Didik. *Jurnal PIJAR MIPA* 15(5: 482-487.

Ikhsan, M. (2016). Pengembangan Modul Berbasis Inkuiri Terbimbing Pada Materi Sistem Gerak Manusia Untuk Meningkatkan Hasil Belajar Siswa Kelas Xi Mia Sma Negeri 1 Wera Kabupaten Bima Nusa Tenggara Barat. *JIME,* 2(1).

Lau, K. H., Lam, T., Kam, B.H., Nkhoma, Richardson, M., J., & Thomas, S. (2017). The Role of Textbook Learning Resources in E-Learning: A Taxonomic Study. *Computers & Education*.

Malmia, W., Makatita, S. H., Lisaholit, S., Azwan, A., Magfirah, I., Tinggapi, H., & Umanailo, M. C. B. (2019). Problem-based Learning as an Effort to Improve Student Learning Outcomes. I*nternational Journal of Scientific & Technology Research,* 8(9): 1140-1143.

Maresatasri, E., B. Subali & Hartono. (2012). Penerapan Model Pembelajaran Inkuiri Terbimbing Berbasis Laboratorium untuk Meningkatkan Hasil belajar dan Sikap Ilmiah Siswa. *Unnes Pyhsics Education Journal, 1(2), 27-31*

Marisa., & Fradisa, L. (2018). Pengaruh Penggunaan Modul Guided Inquiry Terhadap Kemampuan Berpikir Kritis Mahasiswa Stikes Perintis Padang. *Jurnal Ta'dib* vol.21 (2).

Mashur, A, M., Amin, M., & Lestari, U., (2018) Guided Inquiry Learning Module with Multimedia Assisted on Cell Metabolism for XII Grade of Senior High School. *Jurnal Pendidikan Sains* Volume 6, Number 3 pp. 72–79.

Muhammad, N. (2017). Model Pembelajaran Berbasis Masalah untuk Meningkatkan Kemampuan Berpikir Kritis dan Ketelitian Mahasiswa. *Jurnal Pendidikan Universitas Garut* Vol. 11 No. 02 ; 153-163.

Onyema, E. M., Eucheria, N. C., Obafemi, F. A., Sen, S., Atonye, F. G., Sharma, A., & Alsayed, A. O. (2020). Impact of Coronavirus Pandemic on Education. *Journal of Education and Practice*, 11(13): 108-121.

Puti, S & Jumadi. (2015). Pengembangan Modul Ipa Smp Berbasis *Guided Inquiry* Untuk Meningkatkan Keterampilan Proses dan Sikap Ilmiah. *Jurnal Pendidikan Matematika Dan Sains Tahun IiII No.1.*

Putra,. F. G. (2017) Eksperimentasi Pendekatan Kontekstual Berbantuan Hands On Activity (HoA) Terhadap Kemampuan Pemecahan Masalah Matematik. *Jurnal Pendidikan Matematika*, 8(1): 73-80.

Purnomo, D., Indrowati, M., & Karyanto, P. (2013). Pengaruh Penggunaan Modul Hasil Penelitian Pencemaran di Sungai Pepe Surakarta Sebagai Sumber Belajar Biologi Pokok Bahasan Pencemaran Lingkungan Terhadap Hasil Belajar Siswa. *Pendidikan Biologi* vol.5 no.1 halm. 59-69.

Purwanto, Y., & Rizki, S. (2015). Pengembangan Bahan Ajar Berbasis Kontekstual pada Materi Himpunan Berbantu Video Pembelajaran. *Aksomia*. 4(1), 67-77.

Ramdani, E. (2018). Model Pembelajaran Kontekstual Berbasis Kearifan Lokal Sebagai Penguatan Pendidikan Karakter. *Jurnal Pendidikan Ilmu-ilmu Sosial,* 10(1): 1-10.

Rohmiyati, N., Ashadi, A., & Utomo, S. B. (2016) Pengembangan Modul Kimia Berbasis Inkuiri Terbimbing pada Materi Reaksi Oksidasi-Reduksi. *Jurnal Inovasi Pendidikan IPA*, 2 (2), 223-229.

Sa'adah & Kusasi, M. (2017). Meningkatkan Sikap Ilmiah Dan Pemahaman Konsep Menggunakan Model Pembelajaran Inkuiri Terbimbing (Guided Inquiry) Pada Materi Kesetimbangan Kimia. *Jurnal Inovasi Pendidikan Sains, Vol. 8, No.1 78-88.*

Sari, R. F., Syafi'I, W., & Arnentis. (2016). The Development of Learning Module Oriented Model Guided Inquiry To Increase Student Critical Thinking Ability in Circulation System Content For Class XI. *Jurnal Online Mahasiswa vol*.3 no.3.

Setiawati, R., Fatmaryanti, D, S., & Ngazizah, N. (2013). Pengembangan Modul Berbasis inkuiri Terbimbing untuk mengoptimalkan Sikap Ilmiah Peserta Didik pada pokok Bahasan Listrik Dinamis di SMA N 8 Purworejo Kelas X Tahun Pelajaran 2012/2013. *Jurnal Berkala Pendidikan Fisika*. 3(1).

Septiani, D., Ridlo, S., & Setiati, N. (2013). "Pengembangan Lembar Kerja Siswa Berbasis Multiple Intelligences pada Materi Pertumbuhan dan Perkembangan". *Unnes Journal of Biology Education*, 2 (3): 359-365.

Sugiyono. (2010). *Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D.* Bandung: Alfabeta.

Sutiani, A., & Maisyarah, D. (2021). Pengembangan Modul Berbasis *Guided Inquiry* pada Pokok Bahasan Laju Reaksi. *Jurnal Inovasi Pembelajaran Kimia* Vol 3 No. 1 hal 96 – 105.

Syafi'I, W., Sari, R. F., & Arnentis. (2016). Meningkatkan Kemampuan Berpikir Kritis Siswa pada Materi Sistem Sirkulasi Kelas XI melalui Pengembangan Modul Pembelajaran Berorientasi Model Guided Inquiry. *Jurnal Biogenesis* Vol. 13 (1): 77-84.

Wijaya, A. S., Medriati, R., & Swistoro, E. (2018). Pengaruh Model Pembelajaran Berbasis Masalah terhadap kemampuan Pemecahan masalah Fisika dan Sikap Ilmiah Siswa di SMAN 2 Kota Bengkulu. *Jurnal Kumparan Fisika* vol.1 No.3 : 23- 35.

Wijaya, O.P., & Bukhori, I. (2017). Effect of Learning Motivation, Family Factor, School Factor an Community Factor on Student Learning Outcomes on Productive Subjects. *Jurnal Pendidikan Bisnis dan Manajemen*, 3(3): 192-202.