



# Journal of Educational Sciences

Journal homepage: <https://jes.ejournal.unri.ac.id/index.php/JES>



P-ISSN  
2581-1657

E-ISSN  
2581-2203

## Analysis of Module Needs as Chemical Teaching Materials on Colloidal Subjects in SMA Negeri 1 Tembilahan

Andini Saputri\*, Sjaeful Anwar, Heli Siti Halimatul

Chemistry Education, Magister Chemistry Education Program, Universitas Pendidikan Indonesia, Bandung, 40154, Indonesia

### ARTICLE INFO

#### Article history:

Received: 11 Aug 2022

Revised: 28 Sept 2022

Accepted: 03 Oct 2022

Published online: 24 Oct 2022

#### Keywords:

Analysis

Teaching Materials

Colloid

### ABSTRACT

The purpose of this study was to analyze the needs of teachers and students on the use of modules as colloidal teaching materials at SMAN 1 Tembilahan. This type of research is descriptive with a qualitative approach. Collecting data using interview sheets and questionnaires. The subjects of this study were three teachers and ten students of class XII IPA 3 SMAN 1 Tembilahan. Based on the results of the questionnaire given, 100% of teachers have used teaching materials that are in accordance with the 2013 curriculum. As many as 67% of teachers experience limited handbooks, both in terms of completeness of materials, explanation techniques, and examples of applying concepts in everyday life. For the use of other teaching materials (outside of school handbooks), only 33% used them while the rest had not used other teaching materials. Regarding the use of application-based teaching materials during the learning process, 100% of teachers have never used them. 33% of teachers have developed teaching materials in the form of modules independently and the rest have never. 100% of teachers expressed interest in the electronic module. From the results of the questionnaire analysis of student needs, it can be concluded that students need a teaching material that can help them to more easily understand chemical concepts and the teaching materials are equipped with pictures, videos, and animations so that learning becomes more interesting and interactive.

## 1. Introduction

Education is a conscious and structured effort to realize the atmosphere and learning process so that learners are active in empowering their potential to have spiritual strength, self-control, personality, intelligence, noble morals, and skills (Briyanti, 2020). Through human education can optimize their potential and can imitate the things they face. The main purpose of education is to educate people's

\* Corresponding author.

E-mail: andinisptr23@gmail.com

Doi: <https://doi.org/10.31258/jes.6.4.p.645-652>

lives. The development of the quality of education can be done by improving the quality of learning and interaction with learning resources used in the learning process. Learning is the process of constructing knowledge through thinking activities. Learning can hone the critical thinking skills of learners, of course by teaching them using their critical thinking skills which is one of the goals of education itself (Kazempour, 2013) and also is the implementation of the 2013 curriculum.

In the 2013 curriculum, the role of teachers as educators is required to be able to design learning that meets the needs of the 21st century, one of which is critical learning, where learners are required to be active, critical, innovative and creative during the learning process. This aims to help learners learn independently and also make learners more active in building the cognitive structure that exists within them (Pratama, 2022). In order for this goal to be achieved, teachers are expected to create interactive learning supported by the use of teaching materials (Nuryanti, 2018).

Teaching materials are a set of materials that are systematically designed both written and unwritten so as to create conditions that allow students to learn (Wahyuni, 2015). Teaching materials are used as one of the sources of information that can be directly studied independently or in groups. The availability of teaching materials is very important to support the success of learners in learning. Teaching materials that are usually used by teachers in learning include: student worksheets, LKS, modules, textbooks, handouts, etc. Students often only have one such handbook. This certainly has an impact on the limited information obtained in learning.

One of the teaching materials that can be used to help the learning process is the module. Modules are a book written with the aim that learners can learn independently without or with the guidance of teachers. Learning modules can be designed according to the desired learning needs. In line with this, PP No. 19 Article 20 of 2005 explained that in the learning process, teachers are expected to be able to develop their own learning materials or materials as one of the learning resources for learners (Nurul, 2021).

In the era of globalization, education using science and technology (SCIENCE AND TECHNOLOGY) is interrelated and influences the development of innovative teaching materials. One of them is an electronic module or commonly known as an e-module. Online-based electronic modules are a set of learning resources that focus on a topic and can be accessed over the internet (Hollingsworth, 2015). The University of Central Florida (UCF) and The American Association of State Colleges and Universities (AASCU) define electronic modules (e-modules) as functional divisions of mixed learning that present learning content and problem training or a combination of both in one or more pages (Rahayu, 2019). E-Module is a soft file teaching material that can be opened and read by learners anywhere and anytime (Andani & Yulian, 2018). In addition, e-modules can display readable materials and information using electronic devices. E-modules can help learners to better understand the material

---

being studied, provide opportunities to compete, and explore learners to achieve (Malina, et al., 2021).

Based on the results of interviews with chemistry teachers at Tembilahan State High School, the use of teaching materials in the school is still limited. Learners only use package books, LKS and some materials made by LKPD during classroom learning. The teacher also found the limitations of the handbook both from the completeness of the material, explanatory techniques and examples of application of concepts. Supported by the statements of learners obtained through questionnaires, the handbook that has been used is difficult to understand because the material contained in the handbook is monotonous and less visually interesting because it is more dominant in writing and images only so that learners are less interested in reading and finding learning information. This certainly has an impact on learners in understanding the material taught. Learners also have difficulty understanding chemical concepts during the learning process. The difficulty is caused by several things such as the level of difficulty of chemicals that contain many abstract and difficult concepts so that it takes teaching materials containing text, images, sounds, videos and animations that can complement what is still lacking in the book. Based on interviews conducted by researchers, researchers obtained information that most teachers rarely use teaching materials that can empower students' critical thinking skills during the teaching and learning process. This information is the basic basis for researchers in the purpose of this study, namely to explore and analyze the needs of teachers and students for the development of teaching materials in the form of electronic modules (e-modules) which contain text, images, sound, video and animation and provide links so that they are expected to help expand information and increase student learning resources.

## **2. Methodology**

This research uses qualitative research methods with a descriptive approach. The research was conducted at SMA Negeri 1 Tembilahan with the research subjects of 3 chemistry teachers and students of class XII MIPA 3. Data on the needs of modules as teaching materials is collected with questionnaire instruments given to 3 chemistry teachers and learners and interview sheet instruments to chemistry teachers to find out about the use of teaching materials in schools and module needs as teaching materials, especially on colloidal subjects. The data analysis technique used is descriptive analysis of interview results and looking for an average of the results of the questionnaire which is then described qualitatively.

## **3. Results and Discussion**

Based on the results of the interview, the teacher's needs analysis obtained the results as stated in table 1. Data on the results of the questionnaire distributed to 3 teachers related to the needs and constraints of teaching materials is listed in table

---

2. And the data of the results of the questionnaire distributed to learners is listed in table 3.

Analysis of teacher needs for teaching materials is done through the interview process with the following interview guidelines:

1. What are the teaching materials that you use during the learning process?
2. What do you think about the learner handbook from the visual aspect and completeness of the information?
3. What are the obstacles encountered in chemical learning, especially on colloidal subjects?
4. Have you ever used application-based teaching materials before the learning process?
5. What do you think about the electronic module (e-module)?

Table 1. Teacher Needs Analysis

No.	Question Analysis
1	Package book, LKS, and some LKPD
2	Quite interesting and quite complete
3	Lack of learning resources that can facilitate to study Chemistry subject matter optimally. During this time the explanation given by the book used is difficult to understand by learners while the time to follow the learning process in the classroom is very limited
4	Not yet, only use ppt
5	E-modules can be a good choice of teaching materials, if viewed in terms of visuals can attract the interest of learning learners because it is more interesting when compared to printed books and can be a means of self-study for learners

Table 2. Results of Teacher Needs

No.	Statement	Percentage
1	Teachers uses teaching materials in accordance with the 2013 curriculum	100%
2	Teachers have teaching materials that are in accordance with the 2013 curriculum (e.g. BSE, modules, handouts, or LKS)	100%
3	Teachers have encountered limitations of the handbook (for example the completeness of the material, the technique of explanation along with examples of concept applications).	67%
4	Teachers use other teaching materials (outside of those provided by the school).	33%
5	Teachers have used application-based teaching materials during the learning process.	100%
6	Teachers have had difficulty aligning colloidal subjects, (for example due to limited teaching materials).	67%
7	Teachers have felt the importance of developing other teaching materials (modules) that are more complete and interesting in terms of presentation to align colloidal subjects.	100%
8	Teachers have developed teaching materials (modules) independently.	33%
9	Teachers interested in electronic modules (e-modules)	100%
10	Teachers have used teaching materials that can cultivate	33%

---

11	students' critical thinking skills. Teachers find obstacles to empowering students' critical thinking skills through self-paced activities in learning modules.	33%
----	--	-----

---

From the results of interview analysis and teacher needs questionnaires in tables 1 and 2, it is seen that teachers and learners have handbooks for learning chemistry, but the material contained in the handbook is difficult for learners to understand so that the handbook used is not sufficient as a source of learning. Teachers need other learning resources to support learning activities, as well as need learning resources that can be understood independently by learners. A systematic learning resource that can be understood independently in the form of electronic module teaching materials (e-modules) that can contain text, images and learning videos that are different from printed teaching materials, so that learners can develop their critical thinking skills and to learn to solve problems using their own means and can use them as a source of self-study (Santosa, Santyadiputra, & Divayana, 2017).

Based on the results of the questionnaire provided, 100% of teachers have used teaching materials that are in accordance with the 2013 curriculum. Teaching materials used in the form of package books, LKS, and LKPD in some learning materials. As many as 67% of teachers encountered limitations of the handbook, both in terms of material completeness, explanatory techniques, and examples of concept applications in everyday life. For the use of other teaching materials (outside the handbook of the school), only 33% use it while the rest have not used other teaching materials. Regarding the use of application-based teaching materials during the learning process, 100% of teachers have never used them. 33% of teachers have developed teaching materials in the form of modules independently and the rest have never been. 100% of teachers expressed interest in electronic modules. And therefore, teachers feel the importance of developing other teaching materials in the form of more complete and interesting electronic modules in terms of presentation to align chemicals, especially on colloidal subjects and teaching materials that can foster students' critical thinking skills through independent activities in learning modules.

Based on the results of the needs of learners distributed to 10 students of class XII IPA 3 SMA N 1 Tembilahan, obtained results that are detailed listed in table 3.

Table 3. Results of Student Needs

No.	Questions	Percentages	
		Yes	No
1.	Do you have a handbook for studying chemistry?	100%	0%
2.	Do you study chemistry independently at home?	70%	30%
3.	Are you looking for materials other than a handbook at school to help you understand the material being taught, for example; Internet, magazines or other books?	50%	50%
4.	Is the colloidal subject contained in the handbook already interesting in terms of visualization?	20%	80%

---

---

5.	When presenting in teaching materials is dominated by images, audio, video and moving animations. Are you helped to understand colloidal subjects?	100%	0%
6.	Do you need alternative teaching materials that can be used to learn colloidal concepts more easily and interestingly?	90%	10%
7.	Have you ever used modules as a learning resource in chemistry learning?	70%	30%
8.	Do you know about electronic modules (e-modules) as a source of learning?	40%	60%
9.	Do you want to know and try to learn using electronic modules (e-modules)?	100%	0%

---

From the results of the analysis of the needs of learners in table 3 above it can be concluded that learners need a teaching material that can help them to more easily understand the concepts of chemistry and teaching materials are equipped with images, videos, and animations so that learning becomes more interesting and interactive.

Based on the analysis of needs that have been done, constraints in learning influenced by teaching materials show the importance of the development of teaching materials in the form of electronic modules. The purpose of the development of electronic modules (e-modules) is so that learners can learn independently with or without teacher guidance so that at least this module is expected to contain basic components of teaching materials to achieve these goals. This is in line with what was revealed by Prastowo (2012) that modules are a teaching material that is systematically arranged using language that is easy to understand and understood by learners and can be learned independently without the need for a facilitator. In addition, the results of questionnaires and interviews state that teachers need teaching materials that contain complete, interesting and easy-to-use materials such as electronic modules (e-modules) on colloidal subjects with critical thinking skills based.

#### **4. Conclusion**

Based on the results of the needs analysis and discussion, it can be concluded that the use of teaching materials in schools is still limited. Bahar teaching used in the form of package books, LKS and LKPD in certain materials that are difficult for learners to understand. So that learners need teaching materials with a language that is easier to understand and accompanied by images, videos, and animations so that learners are more interested in finding information with the teaching material. Therefore, it is necessary to design a teaching material in the form of interactive electronic modules based on critical thinking skills on colloidal subjects.

The advice and input for the development of further teaching materials on colloidal subjects is to make efforts to develop teaching materials in other chemicals in high school, and research further for the development of teaching materials on colloidal subjects and research about the effectiveness of the use of teaching materials.

---

## Acknowledgment

I would like to thank Mr. Sjaeful Anwar, and Mrs. Heli Siti Halimatul as mentors who have provided criticism and suggestions in this writing. I also thank the UPI chemistry education lecturer who has become an expert assessor in this research.

## References

- Andani, D. T., & Yulian, M. (2018). Pengembangan bahan ajar electronic book menggunakan software kvisoft flipbook pada materi hukum dasar kimia di SMA Negeri 1 Panton Reu Aceh Barat. *Jurnal IPA & Pembelajaran IPA*, 2(1), 1-6.
- Hollingsworth, H. L., & Lim, C. I. (2015). Instruction via web-based modules in early childhood personnel preparation: A mixed-methods study of effectiveness and learner perspectives. *Early Childhood Education Journal*, 43(2), 77-88.
- Kazempour, E. (2013). The effects of inquiry-based teaching on critical thinking of students. *Journal of Social Issues & Humanities*, 1(3), 23-27.
- Malina, I., Yuliani, H., & Syar, N. I. (2021). Analisis kebutuhan e-modul fisika sebagai bahan ajar berbasis PBL di MA muslimat NU. *Silampari Jurnal Pendidikan Ilmu Fisika*, 3(1), 70-80.
- Nuryanti, L., Zubaidah, S., & Diantoro, M. (2018). Analisis kemampuan berpikir kritis siswa SMP. *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan*, 3(2), 155-158.
- Prastowo, A. (2012). *Panduan Bahan Ajar Tematik*. Yogyakarta: Diva Press
- Pratama, R., Alamsyah, M., & Noer, S. (2022). Analisis Kebutuhan Guru Terhadap Pengembangan Modul dalam Meningkatkan Kemampuan Berpikir Kritis Peserta Didik. *EduBiologia: Biological Science and Education Journal*, 2(1), 7-13.
- Rahayu, J., & Solihatini, E. (2019). Pengembangan Modul Pembelajaran Online Pada Mata Pelajaran Kimia. *Jurnal Ilmiah Wahana Pendidikan*, 5(1), 13-28.
- Santosa, A. S. E., Santyadiputra, G. S., & Divayana, D. G. H. (2017). Pengembangan e-modul berbasis model pembelajaran problem based learning pada mata pelajaran administrasi jaringan kelas XII teknik komputer dan jaringan di SMK TI Bali global Singaraja. *Kumpulan Artikel Mahasiswa Pendidikan Teknik Informatika (KARMAPATI)*, 6(1), 1-11.
- Sari, O. B. M., Risdianto, E., & Sutarno, S. (2020). Analisis kebutuhan pengembangan LKPD berbasis POE berbantuan augmented reality untuk melatih keterampilan proses dasar pada konsep fluida statis. *PENDIPA Journal of Science Education*, 4(2), 85-93.
- Wahyuni, S. (2015, September). Pengembangan bahan Ajar IPA untuk meningkatkan kemampuan berpikir kritis siswa SMP. In *PROSIDING: Seminar Nasional Fisika Dan Pendidikan Fisika* (Vol. 6, No. 6).
-

Yanti, N. H., & Hamdu, G. (2021). Analisis Kebutuhan Pengembangan Elektronik Modul Berbasis Education For Sustainable Development Untuk Siswa di Sekolah Dasar. *Edukatif: Jurnal Ilmu Pendidikan*, 3(4), 1821-1829.

How to cite this article:

Saputri, A., Anwar, S., & Halimatul, H. S. (2022). Analysis of Module Needs as Chemical Teaching Materials on Colloidal Subjects in SMA Negeri 1 Tembilahan. *Journal of Educational Sciences*, 6(4), 645-652.

---