



Development of Teaching Supplement “RESe-CIG” to Improve Understanding of Respiratory System Concepts and Attitudes towards the Dangers of Vaping

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Abstract

Cases of e-cigarette use at the youth level have increased, this proves students' lack of knowledge and caring attitude regarding the dangers of vaping. This research aims to develop a teaching supplement "RESe-CIG" to increase understanding of respiratory system concepts and awareness of the dangers of vaping. This research is Research and Development (R&D) research referring to the steps (1) potential problems, (2) information gathering, (3) product design, (4) design validation, (5) design revision, (6) trial small scale, (7) product revision, (8) large scale trial, (9) product revision, (10) final product. The research data is in the form of feasibility data, product effectiveness data in increasing understanding of concepts, as well as a caring attitude towards the dangers of vaping. All three were analyzed using quantitative and qualitative descriptive methods. The research results show that the "RESe-CIG" teaching supplement is suitable for use as teaching material for the respiratory system with media validity of 95%, material validity of 96.8%, teacher response of 92.5%, and student response of 95%. The application of the "RESe-CIG" teaching supplement as respiratory system teaching material effectively increases understanding of concepts with an N-Gain in the high category of 66% and the medium category of 22% with an average N-Gain of 0.71. The application of the "RESe-CIG" teaching supplement as a respiratory system teaching material effectively increases attitudes towards the dangers of vaping with an N-Gain in the high category of 47% and the medium category of 37% with an average N-Gain of 0.55. Based on the research results, it can be concluded that the development of the "RESe-CIG" teaching supplement is feasible and effective in increasing understanding of concepts and attitudes regarding the dangers of vaping.

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INTRODUCTION

Education is a place or forum that covers all aspects of human life to help them achieve their best potential. Education is an important component in changing human life in a better direction and has positive value in the future. Therefore, education must be provided through teaching, training and guidance in the process of changing a person's attitudes and behavior to mature them.

Biology learning must be delivered in a way that allows students to engage and explore the learning material themselves. Biology is an abstract and universal subject, so to achieve a meaningful learning process, teaching materials are needed. Good teaching materials are materials that are arranged systematically with examples of case studies from daily life and are related to the material being taught or what students need to learn. Teaching materials function as reference materials for students, who then absorb them as part of their education to become knowledgeable, while for teachers, teaching materials function as a source of information to provide knowledge to students (Widiana & Wardani, 2017).

The case study problem that is inherent in students' lives every day is smoking. According to Hidayati *et al.*, (2020) Teaching supplements can increase students' understanding of the risks associated with smoking and their caring attitudes towards it. Teaching supplements as a complement to knowledge that is not contained in the main book will help students think more broadly about science (Putri *et al.*, 2020). The role of teaching supplements is to help students become independent learners so that they can participate in class because they have read the information that will be covered. Teaching supplements indirectly teach them to be self-directed by providing students with more comprehensive material resources and including real-life case studies (Alma *et al.*, 2022).

The respiratory system material is guided by the learning outcomes at the end of phase F, students have the ability to describe the bioprocesses that occur in cells, analyze the relationship between organ structure and organ systems and their functions, as well as abnormalities or disorders that occur in the respiratory organs. Material about the respiratory system needs to be presented with good management because it includes discussion of the complex respiratory processes in the body. The concepts included in learning are used as a component of students' intellectual development (Febriyanto *et al.*, 2018). Students who are less active in searching for learning information, the main book used as a study guide, and the way the teacher presents material on the respiratory system are factors that cause difficulties for students when they study the material. One solution in this case is the use of effective learning media. Efficient learning media can significantly help students understand concepts about the human respiratory system in depth and meaning (Alfionitari *et al.*, 2019). This means that making teaching supplements with case studies of daily life and supplemented by journal research results is one way to meet learning objectives.

Seeing the increasing popularity of e-cigarettes in big cities, especially in the city of Semarang, supportive environmental conditions are a driving factor for teenagers to tend to follow current lifestyles, such as participating in e-cigarette smoking. Both smokers and other people exposed to cigarette smoke can experience health risks from cigarettes. According to Yusup *et al.*, (2021), teenagers with smoking habits can be influenced by several factors, namely the influence of parents and friends, as well as the lifestyle of today's teenagers. This is coupled with teenagers who have high curiosity and the desire to do things like adults (Melda, 2017).

In an effort to control the production of the tobacco epidemic, the World Health Organization (WHO) has implemented various initiatives to prevent smoking as the number of smokers increases, especially among young people. One strategy is to switch from using conventional cigarettes to electronic cigarettes, which are

sometimes referred to as e-cigarettes. Electronic cigarettes were created with the design of providing nicotine for users to experience the sensation of smoking without burning tobacco. Teenagers today are more likely to use e-cigarettes because they believe that e-cigarettes are safer, but the risk of inhaling e-cigarettes is actually not much different from conventional cigarettes.

It is hoped that the teaching supplement developed will be able to increase students' understanding of the risks of exposure to nicotine vapor on the structure and function of the respiratory system. Understanding concepts in science learning is an explanation based on direct observation or experimentation that produces complete and unchanging truth (Eliyana, 2020). Students' ability to understand biological concepts is an important thing they must know. According to Trianggono (2017), seven indicators of concept understanding in Bloom's revised taxonomy, including: (1) interpreting, (2) exemplifying, (3) classifying, (4) summarizing, (5) inferring, (6) comparing, and (7) explaining. This includes how students are able to understand the concept of the respiratory system material and its relation to the case of e-cigarettes studied during the learning process.

Teenagers can be taught to have a caring attitude towards a healthy life through learning at school. A caring attitude regarding e-cigarettes is a person's tendency to react to vaping behavior in the surrounding environment. According to Azwar (2021), attitude has three aspects that support each other, namely (1) cognitive, contains a person's beliefs regarding what applies or what is right for an attitude object which is related to whether or not a person is confident in knowledge of the dangers of vaping, (2) affective, concerns a person's subjective emotional issues towards an attitude object which is equated with the feelings a person has towards the dangers of vaping, and (3) conative, shows how a person's behavior or tendencies are related to the attitude object they face and tends to behave consistently, in accordance with the beliefs and feelings that form the individual's attitude to stop vaping.

The results of research regarding the increase in electronic cigarette users among teenagers show that various efforts are needed to overcome this. Teachers are required to present learning media to support the learning process in the classroom by adjusting the characteristics and needs of students. The development of teaching supplements that contain the dangers of vaping based on the results of research in scientific journals can be integrated into learning because it is more applicable and contemporary. The availability of research-based teaching supplements provides a great way to reinforce information about the respiratory system in everyday life.

Based on existing facts and problems, it is necessary to develop teaching supplements to increase students' understanding of concepts and caring attitudes towards the dangers of vaping on the respiratory system through Research and Development (R&D) research procedures. This research produces a product in the form of a teaching supplement whose feasibility and effectiveness tests have been carried out so that it can be used as a complement to biology teaching materials on the respiratory system in SMA/MA.

RESEARCH METHOD

Research on the development of the "RESe-CIG" teaching supplement was carried out in the even semester of the 2023/2024 academic year at SMA Negeri 1 Semarang and SMA Negeri 14 Semarang. The research design for large-scale trials is Pre Experimental Design with One Group Pretest-Posttest type with purposive sampling technique. The research subjects in the small-scale trial were 15 students in class XI-09 of SMA Negeri 1 Semarang, while research subjects in large-scale trial carried out with a total sample of 73 students, including 48 students in class XI-8 and XI-9 of SMA Negeri 1 Semarang, and 25 students in class XI-6 of SMA Negeri 14 Semarang. The result of product development is in the form of a teaching supplement "RESe-CIG" which increases students' understanding of concepts and caring attitudes towards the dangers of

vaping on the respiratory system. In this research, the data collected includes validity of media and materials, teacher and student responses, concept understanding test questions, as well as a questionnaire on the attitude scale regarding the dangers of vaping in the form of a questionnaire. The effectiveness of the supplement is measured by increasing understanding of respiratory system concepts and students' caring attitude towards the dangers of vaping results $\geq 75\%$ of students who obtained moderate to high N-Gain criteria.

RESULTS AND DISCUSSION

This research was motivated by the increasing cases of e-cigarette use among teenagers. The emergence of many cases of e-cigarette use is partly due to a lack of knowledge and awareness among teenagers about the dangers of using e-cigarettes. One form of education about the dangers of vaping in schools is through learning about the respiratory system. In studying the respiratory system, students learn to evaluate the dangers of vaping and its impact on health, especially on the respiratory system. Generally learning about the respiratory system uses textbooks as a learning resource, however there are shortcomings in textbooks, namely that the content is presented only in written form which is less attractive to students and does not contain examples of real cases in the surrounding environment.

In developing the "RESe-CIG" teaching supplement, media validity, material validity, teacher responses and student responses are needed to determine the suitability of the teaching supplement that has been developed so that it can be used in learning about the respiratory system. The criteria for appropriateness of textbook content as a reference in learning have been determined by the BSNP, stating that the contents of the book must fulfill material aspects, linguistic aspects, material presentation aspects and graphic aspects.

Eligibility of the "RESe-CIG" Teaching Supplement

The validity of the "RESe-CIG" teaching supplement on respiratory system material was obtained from data from media expert validation and material expert validation by filling out an instrument in the form of a statement questionnaire as well as criticism and suggestions for improvement for the validity of the "RESe-CIG" teaching supplement. In the media validation instrument there are 10 statements regarding graphic aspects in the "RESe-CIG" teaching supplement in the form of appropriateness of book size, appearance, illustrations and typography in the cover design and contents of the book. Validity results by media experts are presented in Table 1

Table 1 Validity Results of Teaching Supplement Media "RESe-CIG"

Indicator	Total score	Max score	Percentage	Category
Book size	4	4	100%	Very valid
Book cover design	11	12	91.6%	Very valid
Book content design	23	24	95.8%	Very valid
Total number	38	40	95%	Very valid

Apart from this percentage, there is an assessment in the form of criticism and suggestions given by media expert validators, namely adding the name of the supervisor on the cover and improving the long narrative in the content of the "RESe-CIG" teaching supplement. In the validation assessment by media experts, the highest indicator was the size of the book which received a percentage score of 100% in the very

valid category. The "RESe-CIG" teaching supplement has been adapted to ISO standards, namely using B5 size paper (176 x 250 mm) which with this size is able to display text and images that match the layout of the contents of the teaching supplement.

In the book content design indicator, it obtained a percentage score of 95.8% in the very valid category. Consistency and harmony, as well as the completeness of the layout of the book's contents, are arranged proportionally and adjusted to the hierarchy of presentation of teaching materials so that the delivery of information in the contents of the book is quickly understood. The arrangement of the text in the contents of the book also provides a coherent picture to clarify the respiratory system material. However, the large number of long narratives that exceed the width of the normal text structure makes the text content seem very large and untidy to look at. Therefore, the design settings for the contents of the book were improved so that it looks neat and interrelated between the layout, typography, and even illustrations of the contents of the book. The "RESe-CIG" teaching supplement is interesting in terms of illustrations with lots of colorful pictures and not just presented in words, making it interesting for students in studying the contents of the book. Therefore, to make it easier to teach the material, attract students' interest, and speed up students' understanding of the material, it is applied to teaching materials that are equipped with appropriate images (Rohemah *et al.*, 2022).

The lowest indicator assessment is the book cover design which received a percentage score of 91.6% in the very valid category. The appearance of the book cover uses color as a beauty that looks attractive so that it can clearly reflect the contents of the book even if you only look at the book cover. The appropriateness of the placement of the layout and the harmony of the arrangement of color, illustration and typography elements on the appearance of the book cover also have unity and are mutually related to each other. The book cover illustration combines elements of shape, color and size regarding illustrations of respiratory organs and e-cigarettes which depict the teaching material appropriately so as not to cause misunderstandings and interpretations. In book cover typography, use font sizes appropriate to the size of the book and don't use too many font combinations but are able to attract attention and convey the message appropriately.

The next validation is validation by material experts. In the material validation instrument there are 8 statements regarding the appropriateness, presentation and linguistic aspects of the "RESe-CIG" teaching supplement. Validity results by material experts are presented in Table 2

Table 2 Validity Results of "RESe-CIG" Teaching Supplement Material

Indicator	Total score	Max score	Percentage	Category
Material feasibility	7	8	87.5%	Very valid
Presentation	16	16	100%	Very valid
Language	8	8	100%	Very valid
Total number	31	32	96.8%	Very valid

The material compiled in the "RESe-CIG" teaching supplement must be suitable and pass validity tests so that it can be used as additional teaching material for students. In terms of material validity, presentation and linguistic aspects received the highest scores. The presentation aspect of the "RESe-CIG" teaching supplement received a percentage score of 100% with very valid criteria. Presentation with a coherent flow of chapters and subchapters, relevant images, complete with a table of contents, about the book, glossary and bibliography makes using the book easier to use. The material presented in the "RESe-CIG" teaching supplement with the integration of research and cases based on situations and conditions in everyday life

makes the teaching material more interesting because of the novelty and contextuality of the actual material presented. Research-based teaching supplements are believed to be able to expand students' knowledge and improve the quality of learning (Hafsah, 2015).

The linguistic aspect obtained a percentage score of 100% with very valid criteria. The teaching supplement "RESe-CIG" has been prepared with sentences that are effective and efficient, easy to understand, capable of motivating students, and in accordance with good and correct Indonesian language rules. Writing scientific and foreign names also written in italics can help students to interpret sentences in the material correctly and without double meaning.

The aspect that received the lowest score was the material feasibility aspect with a percentage score of 87.5% with very valid criteria. The suitability aspect of the material consists of 2 assessment points, namely the suitability of the material to the learning objectives and the accuracy of the material. The "RESe-CIG" teaching supplement has been adapted to the learning objectives in accordance with the current curriculum. Material containing anatomical structures, disorders and the impact of smoking on the respiratory system is presented accurately with appropriate facts from various health information sources. The selection of pictures, tables and illustrations in the contents of the book have also been presented attractively. However, the concept presented only focuses on students' respiratory system material so it needs to be improved by adding some additional material from journal research which has been adjusted to the students' level of understanding.

Responses to the "RESe-CIG" teaching supplement were obtained through a teacher response questionnaire. The results of the teacher response questionnaire are presented in Table 3

Table 3 Results of Teacher Responses to the "RESe-CIG" Teaching Supplement

Aspect	Total score	Max score	Percentage	Category
Graphics	12	12	100%	Very good
Presentation	9	12	75%	Good
Material	18	20	90%	Very good
Language	15	16	93.75%	Very good
Use	20	20	100%	Very good
Total number	74	80	92.5%	Very good

Student responses to the "RESe-CIG" teaching supplement were obtained through a student response questionnaire. In this research, the questionnaire was filled out by 15 class XI-8 students of SMAN 1 Semarang. The results of the student response questionnaire are presented in Table 4

Table 4 Results of Student Responses to the Teaching Supplement "RESe-CIG"

Aspect	Total score	Max score	Percentage	Category
Graphics	176	180	97.7%	Very good
Presentation	230	240	95.8%	Very good
Material	340	360	94.4%	Very good
Language	114	120	95%	Very good
Use	281	300	93.3%	Very good
Total number	1140	1200	95%	Very good

The "RESe-CIG" teaching supplement displays pictures, illustrations and tables of the dangers of e-cigarettes on the respiratory system with color combinations that are comfortable to look at so they are not eye-catching. The respiratory system material in the "RESe-CIG" teaching supplement is presented sequentially by displaying picture illustrations that make it easier for students to understand the material. The "RESe-CIG" teaching supplement presented is related to everyday life so it contains learning material about the dangers of e-cigarettes on the respiratory system.

The material presented comes from various sources, including biology textbooks, books about the dangers of e-cigarettes, and case issues from journal research. Based on this, the "RESe-CIG" teaching supplement with case examples and research is believed to provide new knowledge or understanding regarding the health care attitude of the respiratory system regarding the dangers of e-cigarettes. This is in line with Slameto (2015) which states that with using a research-based learning approach, it is hoped that students' character will have great curiosity, the ability to solve any problem, a systematic, objective way of thinking, and a strong rationale.

Writing the contents of the supplement also uses clear and easy to read letters, and writes scientific or foreign names correctly. This is in line with Kusuma (2018) which states that the preparation of textbooks must pay attention to linguistic elements related to readability elements because language standards include; uses good and correct Indonesian, terminology adheres to refined spelling, clarity of language used, suitability of language, ease of reading.

The teaching supplement "RESe-CIG" which displays the dangers of vaping can make it easier for teachers to convey material on the respiratory system so that learning objectives can be achieved. In addition, the "RESe-CIG" teaching supplement is believed to help increase students' understanding of the respiratory system and awareness of the dangers of e-cigarettes.

Effectiveness of the "RESe-CIG" Teaching Supplement

Supplements that have been declared valid and suitable for use in learning about the respiratory system are then used for large-scale testing to determine the effectiveness of the supplement in increasing students' understanding of concepts and attitudes towards the dangers of vaping. The effectiveness test was carried out with a total sample of 73 students, including 48 students in classes XI-8 and XI-9 at SMA Negeri

1 Semarang, and 25 students at SMA Negeri 14 Semarang. Data on the effectiveness of conceptual understanding was taken by administering a concept understanding test in the form of 22 multiple choice questions, while data on the effectiveness of an attitude of caring about the dangers of vaping was taken by administering a caring attitude questionnaire with 20 statement items. Large-scale trial data collection was carried out before and after the implementation of the "RESe-CIG" teaching supplement, but the concept understanding test instrument was tested for validity first with a small-scale trial in classes that had previously studied respiratory system material. Supplements are declared effective if they show an increase in test results for understanding concepts and attitudes towards caring about the dangers of vaping. Students were very interested in the teaching supplement "RESe-CIG" during the learning process, as shown by the various questions asked, students enthusiastically helped the learning process run well and produced interesting discussions.

Effectiveness of the "RESe-CIG" Teaching Supplement in Increasing Concept Understanding

The effectiveness of the teaching supplement product "RESe-CIG" can be seen from increasing students' understanding of concepts. The use of the "RESe-CIG" teaching supplement in learning the respiratory system can increase understanding of concepts in terms of the N-Gain test. After the pretest and posttest scores were collected, the scores obtained were analyzed using the N-gain test. This test is used to find out how effective the treatment is. The average N-Gain score obtained was 0.71 in the high category. With these results, it was found that the teaching supplement product "RESe-CIG" was effective in increasing students' high conceptual understanding in learning the respiratory system. The ability to understand the concept of the respiratory system in this study is based on seven indicators. The results of students being able to answer the concept understanding test based on these indicators are presented in Table 5

Table 5 Students' Concept Understanding Ability

No.	Concept Understanding Indicator	Question Number	Percentage	
			Pretest	Posttest
1.	<i>Interpreting</i>	5	85%	96%
		10	74%	95%
		Average	79.5%	95.5%
2.	<i>Exemplifying</i>	1	95%	100%
		16	62%	95%
		22	22%	78%
Average	59.6%	91%		
3.	<i>Classifying</i>	6	64%	95%
		14	22%	84%
		19	53%	92%
Average	46.3%	90.3%		
4.	<i>Summarizing</i>	2	85%	100%
		3	66%	96%
		4	66%	88%
		7	70%	89%
		20	42%	89%
Average	65.8%	92.4%		
5.	<i>Inferring</i>	8	62%	89%
		9	62%	85%
		18	77%	96%
Average	67%	90%		
6.	<i>Comparing</i>	11	78%	93%
		12	78%	95%
Average	78%	94%		
7.	<i>Explaining</i>	13	16%	70%
		15	25%	70%
		17	64%	84%
		21	36%	82%
Average	35.2%	76.4%		

Students' conceptual understanding was measured using a pretest and posttest with a total of 22 multiple choice questions. The scores obtained from 73 students were analyzed using N-Gain to determine the increase in students' understanding of concepts. The N-Gain test results can be seen in Table 6

Table 6 Concept Understanding N-Gain Test Results

Criteria	The number of students	Percentage
Tall	48	66%
Currently	16	22%
Low	9	12%
Total number	73	100%

Based on Table 6, it can be seen that the posttest results given were 22 multiple choice questions on the respiratory system material, showing that 95.5% of students were able to interpret information from one form to another. This shows that interpreting ability is an indicator of concept understanding with the highest percentage of students, while the lowest score is in the explaining indicator with a percentage of 76.4%, so it can be said that students' ability to use cause and effect models in a concept is still lacking. If sorted from highest to lowest percentage, namely interpreting, comparing, summarizing, exemplifying, classifying, inferring, and explaining.

The increase in understanding of concepts in this research was caused by the application of the "RESe-CIG" teaching supplement which can increase students' interest in learning because of the superiority of the "RESe-CIG" teaching supplement which contains picture and color illustrations which make students more interested in reading the material contained in it. inside. The use of learning media in the learning process can also increase student creativity, attract student attention to the teacher's explanation, and increase student understanding of concepts. Students tend to feel more comfortable and learning becomes more enjoyable when the material is presented in the "RESe-CIG" teaching supplement.

They must achieve students' ability to understand the concept of the respiratory system. Learning is carried out using lecture and discussion learning models. The teacher and students have a discussion where the teacher asks several questions and the students must answer them. This activity can help students understand the concept of the respiratory system from an initial level. Discussion activities aim to help students gain an understanding of the concept of the respiratory system, make connections between e-cigarettes and the respiratory system, and organize concepts so that learning objectives in the respiratory system material can be achieved. Students' understanding of concepts in the respiratory system material can increase because students' learning knowledge is built automatically through the provision of the "RESe-CIG" teaching supplement. This is in line with Murniayudi *et al.*, (2018) which states that understanding the concept allows someone to transfer knowledge about a phenomenon into various conditions that have been previously analyzed through the way each individual learns and thinks about a science.

Effectiveness of the "RESe-CIG" Teaching Supplement in Increasing Awareness of the Dangers of Vaping

Before being used, the caring attitude scale was tested for validity by an expert attitude validator. In the material validation instrument there are 9 statements regarding concept, language and appearance indicators on the caring attitude scale questionnaire. The results of the validation of the attitude scale are presented in Table 7

Table 7 Validity Results of the Concern Attitude Scale for the Dangers of Vaping

Indicator	Total score	Max score	Percentage	Category
Draft	13	16	81.25%	Very valid
Language	12	12	100%	Very valid
Appearance	6	8	75%	Valid
Total number	31	36	86.1%	Very valid

Increasing students' caring attitude towards the dangers of vaping was obtained through caring attitude scale data which was created based on attitude scale indicators and has been validated by expert attitude validators. Validation of the attitude scale from attitude experts can be used with revisions in the form of adding an explanation or construct about caring to the blueprint and sharpening the narrative or description of caring about the dangers of vaping in the indicator section of the attitude scale.

Data on attitudes regarding the dangers of vaping were taken twice, namely before learning with the "RESe-CIG" teaching supplement and after learning with the "RESe-CIG" teaching supplement. The caring attitude in this research is based on three aspects. The results of students being able to answer the caring attitude questionnaire based on these aspects are presented in Table 8

Table 8 Aspects of Attitude to Care about the Dangers of Vaping

No.	Aspects of Caring Attitude	Indicator	Percentage Yield	
			Before	After
1.	Cognitive	Knowledge about caring about the dangers of vaping is demonstrated by knowing the basic knowledge of e-cigarettes	59%	92%
2.	Affective	Feelings about caring about the dangers of vaping are shown by the dangers of e-cigarettes	82%	92%
3.	Conative	The tendency to care about the dangers of vaping is shown by the behavior of refusing e-cigarettes	85%	95%

From the results of the analysis that has been carried out, it can be seen that the attitude of caring about the dangers of vaping among students has increased. The overall results of the N-Gain test can be seen in Table 9

Table 9 N-Gain Test Results Students' Concern Attitude towards the Dangers of Vaping

Criteria	The number of students	Percentage
Tall	34	47%
Currently	27	37%
Low	12	16%
Total number	73	100%

After carrying out the pretest and posttest, there was an increase in attitudes regarding the dangers of vaping. Based on table 4.9, from a total of 73 students, the results showed that 61 students had medium to high N-Gain score criteria with a total percentage of 84%. The results of increasing students' caring attitude towards the dangers of vaping before and after treatment with the N-Gain test for each aspect of caring attitude can be seen in Table 10

Table 10 N-Gain Test Results for Each Aspect of Students' Concern about the Dangers of Vaping

Aspect	Average N-Gain	Category
Cognitive	0.74	Tall
Affective	0.60	Currently
Conative	0.51	Currently
Total number	0.55	Currently

Increasing students' caring attitudes towards the dangers of vaping is assessed from 3 aspects, including cognitive (knowledge), affective (feelings) and conative (tendencies) aspects. Regarding the attitude of caring about the dangers of vaping, shown by the behavior of refusing e-cigarettes. With these results, it was found that the teaching supplement product "RESe-CIG" was effective in increasing students' caring attitude towards the dangers of vaping. Increasing students' caring attitudes towards the dangers of vaping obtained the highest results in the aspect of students' cognition or knowledge.

In the cognitive aspect, maintaining physical health to avoid danger *vaping* shows how students view the importance of maintaining personal health from a physical and mental perspective. The existence of the "RESe-CIG" teaching supplement makes students aware that vaping is dangerous for the respiratory system if used so that students care more about their own health. The increase in knowledge in this research can be seen through students' cognitive learning outcomes in learning the respiratory system. This increase was obtained after implementing the "RESe-CIG" teaching supplement in learning the respiratory system. The "RESe-CIG" teaching supplement that is implemented has content in the form of respiratory system learning material that is appropriate to the learning outcomes and objectives so that it is suitable for application in respiratory system learning. In addition, the sequential layout contains initial knowledge of e-cigarettes, the impact of e-cigarettes, as well as examples of cases resulting from vaping presented in different chapters so that the application of the "RESe-CIG" teaching supplement can raise the correct perception regarding the dangers of vaping, and when students Having the correct perception about the dangers of vaping means students will be more concerned about the dangers of vaping.

In the affective aspect, the results of the lowest increase in caring attitudes were obtained. As students' knowledge about themselves increases, indicators of recognizing feelings to protect themselves from the dangers of vaping show that students will not be interested in trying e-cigarettes as a solution to solve their problems, However, based on the questionnaire, many students still do not realize that the impact of using e-cigarettes can be worse than using conventional cigarettes. Students still feel that vaping can reduce existing problems because they think that the liquid in e-cigarettes can relieve the stress they are experiencing. Apart from that, due to good student knowledge, students already know that there is a relationship between exposure to e-cigarette vapor and the health of the respiratory system, so e-cigarettes cannot be used as a tool to help stop smoking and can cause the effects of addiction or dependence. Therefore, students need to build an optimistic spirit to avoid the dangers of vaping by increasing students' feelings and views to become a generation that lives a healthy lifestyle by not using e-cigarettes.

In the conative aspect, the tendency to behave in telling each other about the dangers of vaping shows students' concern for mutual empathy with others about the dangers of vaping. Many students agree that if a friend asked them to try vaping, they would not try even a little because they were curious. Students' attitudes, feelings and perspectives about vaping are shown by their increasing concern for maintaining a healthy respiratory system for themselves and others.

From the results of the attitude scale before and after the implementation of the "RESe-CIG" teaching supplement, it was found that there was an increase in the overall indicators of students' caring attitude towards the dangers of vaping. This is due to the formation of perceptions regarding the dangers of vaping through learning, resulting in an increase in knowledge which is directly proportional to the increase in students' caring attitude towards the dangers of vaping. This is in line with research (Nuha & Lisdiana, 2019) shows effective results in improving learning outcomes and increasing students' awareness of the attitude of caring about the dangers of e-cigarettes for health. Based on student responses, the use of the "RESe-CIG" teaching supplement provides new insights and makes students more aware of the dangers of vaping, so in general it can be concluded that the application of the "RESe-CIG" teaching supplement is effective in increasing students' caring attitude towards the dangers of vaping.

Correlation Test of Understanding Concepts with Attitudes of Concern about the Dangers of Vaping

The correlation test aims to determine the level of closeness of the relationship between variables, apart from that it can also be used to determine the direction of the relationship between variables. The results of the correlation test between understanding the concept of the respiratory system and an attitude of caring about the dangers of vaping can be seen in Table 11

Table 11 Pearson Product Moment Correlation Test Results

		Concept Understanding	Caring Attitude
Concept Understanding	Pearson Correlation	1	,679**
	Sig. (2-tailed)		<.001
	N	73	73
Caring Attitude	Pearson Correlation	,679**	1
	Sig. (2-tailed)	<.001	
	N	73	73

** . Correlation is significant at the 0.01 level (2-tailed).

Based on table 11, it shows that the correlation coefficient result is 0.679 so it is categorized as having a strong correlation level with a significance of 0.001. The significance value shows that $0.001 < 0.05$ means that there is a significant relationship between understanding the concept of the respiratory system and caring about the dangers of vaping. The resulting correlation test shows a positive correlation (+) which shows that the relationship is in the same direction, that is, if students' ability to understand concepts increases, students' caring attitude towards the dangers of vaping will also increase.

The arrangement of material is accurate, contextual, aligned with learning objectives, and easy to read and understand, supported by graphic, material, presentation, linguistic and usage aspects. In addition, when students read the teaching supplement "RESe-CIG", the design, image illustrations and colors become objects that are used directly to attract their attention. Students can be encouraged to understand the material thoroughly through case implementation and research. This can increase knowledge and attitudes regarding the dangers of vaping. Based on an assessment with reference to using BSNP, the "RESe-CIG" teaching supplement was declared feasible and valid to be applied as another learning resource on respiratory system

material in SMA/MA, especially class XI.

CONCLUSION

Based on the analysis of the results and the description of the discussion that has been presented, it can be concluded that the "RESe-CIG" teaching supplement that has been developed is suitable for use as teaching material for the respiratory system and that the "RESe-CIG" teaching supplement in learning the respiratory system is effective in increasing students' understanding of concepts. as well as students' caring attitude towards the dangers of vaping.

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