ISSN 2964-4291
https://proceeding.unnes.ac.id/index.php/iset

The Development of Teaching Supplement "When Vape Means Fire" for Respiratory System Disorders Learning at SMA Negeri 1 Bumiayu

Yusdike Adystia, Lisdiana Lisdiana*, Ari Yuniastuti

Universitas Negeri Semarang, Indonesia
*Corresponding Author: lisdiana@mail.unnes.ac.id

Abstract. The development of the teaching supplement "When Vape Means Fire" is a solution in complementing the teaching materials used by teachers in learning respiratory system disorders where the teaching supplement developed provides actual information and it is also based on research results about vaping and its dangers. This study aims to develop a teaching supplement "When Vape Means Fire" and measure its feasibility. The research method in this research is Research and Development with ADDIE model development design (Analysis, Design, Development, Implementation, and Evaluation). The data collection technique used a questionnaire with an instrument in the form of a feasibility test sheet for teachers and students. The data is then analyzed quantitatively to determine the feasibility category and further deepened by qualitative analysis. The results of the development of the "When Vape Means Fire" teaching supplement were tested for feasibility. The feasibility was tested on 2 biology teachers at SMA Negeri 1 Bumiayu with 97.5% results and 30 students in class XI MIPA 5 at SMA Negeri 1 Bumiayu with 87.3% results, both of which were in the Very Feasible category.

Keywords: Feasibility; Teaching Supplement; Vape

How to Cite: Adystia, Y., Lisdiana, L., Yuniastuti, A. (2022). The Development of Teaching Supplement "When Vape Means Fire" for Respiratory System Disorders Learning at SMA Negeri 1 Bumiayu. *ISET:International Conference on Science, Education and Technology* (2022), 377-382.

INTRODUCTION

The development of the world in the 21st century is marked by progress and the demands of the times. In the 21st century, human capital is slowly being replaced by technology, so humans need to have skills to follow today's standards. Therefore, teachers as learning agents must have the necessary expertise and authority to carry out the learning process. The expertise and authority of teachers, one of which is determined by mastery of the learning process and also being able to use and develop interesting learning resources that are easy to use, in line with the guidelines for the development of science and technology (IPTEK) (Widhiarta, 2019) so that they can lead students to achieve educational goals. Therefore, teachers must have high self-discipline, always try to apply learning methods that can equip students with both attitudes, knowledge and skills (Rostika & Prihatini, 2019).

Based on the results of interviews, the Core Competence regarding the respiratory system is Core Competence 3.8. Analyzing the relationship between the structure of the tissues making up the organs in the respiratory system in relation to bioprocesses and functional disorders that can occur in the human respiratory system and Core Competence 4.8. Presenting the results of the analysis of the effect of air pollution on abnormalities in the structure and function of the respiratory system. The function of the human respiratory organ is based on a literature study. Teachers only use teaching materials to support the Biology learning process, the teaching materials used today are based on observations using only government teaching materials, namely school textbooks. The contents of the book are considered incomplete and lacking in depth, so it is necessary to add teaching supplements that provide up-to-date information to improve students' understanding and achieve learning objectives.

Putra et al. (2019), examined the effect of exposure to vape smoke compared to exposure to conventional tobacco smoke which was tested on male rats which showed histopathological structural damage to the lungs of rats caused by vape smoke and conventional cigarette smoke turned out to be equally harmful and cause significant loss. In addition, there is research conducted by Dr. Lisdiana, M.Sc., Dr. Nugrahaningsih W.H, M. Kes., Prof. Dr. Priyantini Widyaningrum M.S., and Dra. Ely Rudyatmi, M.Si. entitled "Analysis of Lung Histopathology Due to Exposure to Electronic Cigarettes (Electronic Nicotine Delivery System Ends) in Rats" whose purpose is to analyze the damage to the microanatomical structure of the lungs of rats exposed to e-cigarettes. The results show that exposure to e-cigarettes can cause lung

damage in mice. Lung damage can be in the form of neutrophil infiltration, alveolar septal damage and edema (Lisdiana et al., 2017).

The results of this study can be used as a medium that is presented to communicate current information that will be given as a research-based teaching supplement on the material of respiratory system disorders. Therefore, it is necessary to innovate learning resources that can improve students' understanding, particularly by using research results in the form of information that is applied in everyday life, one of which is about the dangers of vaping for the health of the recirculation system so that it can provide up-to-date information to students that can be used as a learning resource. which will be packaged in the form of a teaching supplement with the title "When Vape Means Fire". The purpose of this study was to develop a research-based teaching supplement with the title "When Vape Means Fire" and to determine the feasibility of a research-based teaching supplement that was developed.

METHOD

The development of a research-based teaching supplement with the title "When Vape Means Fire" was designed with a research and development design (Reserch and Development) based on the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) (Aldoobie, 2015). The data collection techniques in this study consisted of a questionnaire. From the data collection, the instruments needed in this study include a feasibility questionnaire sheet by teachers and students. The data was analyzed quantitatively to determine the feasibility category and was deepened by a qualitative analysis of the advantages and disadvantages of the book.

RESULTS AND DISCUSSION

The development of a teaching supplement based on the research results "When Vape Means Fire" is based on an analysis of the needs of students for learning resources for disorders of the respiratory system that are relevant to the material of the respiratory system. Then design the main content of the teaching supplement in which the main content design of the teaching supplement consists of a Cover with the title When Vape Means Fire, Foreword, Table of Contents, List of Pictures, List of Tables, Introduction, Vape Dangers and Nicotine Content, Research Results Vape Hazards, Consequences Vape, Glossary, References and About the Author.

The teaching supplement will contain information that can support the learning process of respiratory system disorders. Furthermore, a literature study was conducted from various books and articles about vaping, its contents, and its dangers. It also reads the results of research on the dangers of vaping, most of which have been tested on the dangers of vaping on mice. After doing a literature study, then hunting for personal documentation was carried out at the nearest vape store. Several photos were taken to complete the illustration of the developed teaching supplement. Such as photos of various vaping products, various kinds of vaping liquids, photos of people who are vaping, and photos of illustrations of people affected by brain disorders due to vaping. Photos that are difficult to personally document can be searched on the internet by always citing the source. The next product was developed using a design application, namely CorelDRAW X7. Here is an image of the cover design of the teaching supplement that was developed

Figure 1. Teaching supplement cover design

The cover of the teaching supplement is designed in sage green, white and gray colors with the image contained in the cover of the teaching supplement, namely a human being burned by fire while holding a vape in their hands. This is in accordance with the written title, "When Vape Means Fire" which means a very dangerous vape. The next page after the cover is the introduction, followed by a table of contents, a list of tables and then a list of pictures. Before entering the discussion about vaping, write an introduction first. The following is an introductory design drawing and the initial chapter of the teaching supplement that was

developed

Figure 2. Introduction Design

Figure 3. Chapter prefix design

At the beginning of the chapter always use letters with a larger font size, then each chapter ends with words about the dangers of vaping or some kind of motivation to better convince readers to understand the dangers of vaping so that they stop using it. Here is an image of a motivational word design.

Figure 4. Motivational word design

Some chapters are also equipped with a column "let's write!" *(Ayo Menulis)* which contains a question to be answered by students. Aims to determine the extent to which students' ability to understand the material and solve solutions to existing problems related to the material. Here is a picture of the column design "let's write!".

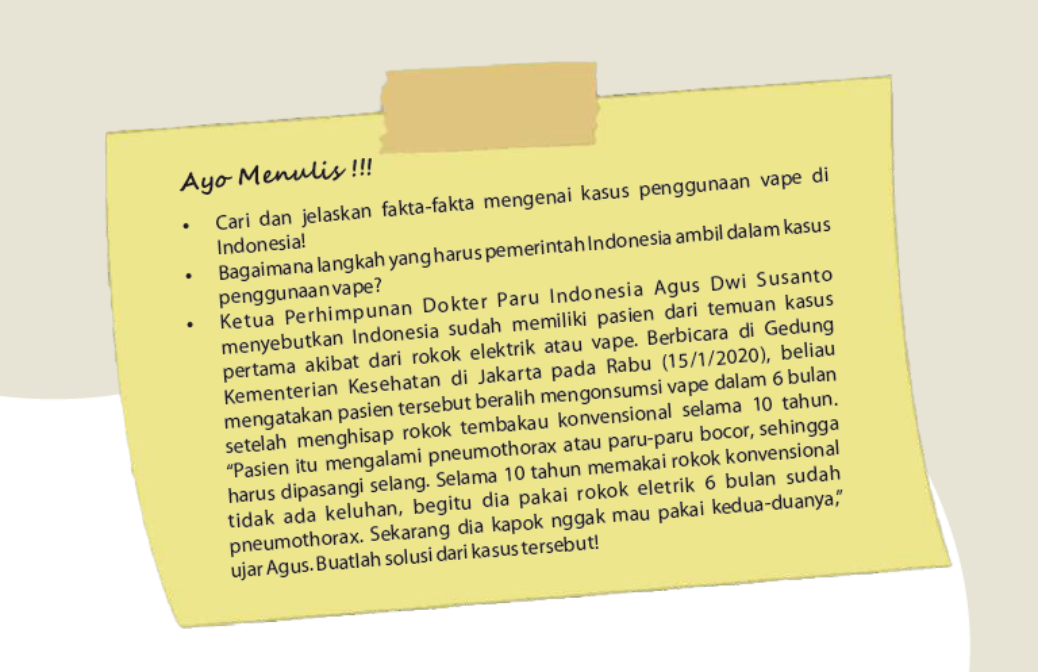

Figure 5. "Let's write!"column design

Then there is also a glossary which aims to make it easier for students to find scientific understanding that may still feel foreign to students.

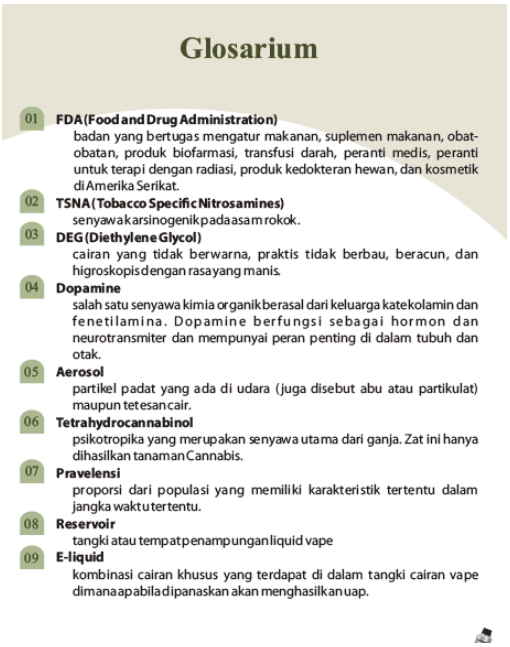

Figure 6. "Let's write!"Column design

After product development had been carried out, to determine the feasibility of the teaching supplements that had been developed, trials had been carried out. The trial was conducted on 2 biology teachers and 30 students of class XI MIPA 5 SMA Negeri 1 Bumiayu.

The results of the feasibility test by the teacher can be seen in the table below.

Table 1. Feasibility Test by Teacher

Aspect	Indicator	Score (%)
Media function	When Vape Means Fire teaching supplement helps in learning activities	100
Accuracy of media as a teaching supplement	When Vape Means Fire teaching supplement is suitable for use in learning activities	100
Interest in media	The teacher is interested in using the When Vape Means Fire teaching supplement in learning activities on respiratory system disorders	87.5

The teacher gave feedback regarding the function of the media, the accuracy of the media as a teaching supplement, and interest in the media. The results of the teacher's responses obtained reached the percentage score that was included in the Very Feasible category, which was 97.5%. The last indicator only got a score of 87.5 because one teacher only gave a score of 3. However, a score of 3 still shows that the teacher is interested in using the When Vape Means Fire teaching supplement in learning activities on respiratory system disorders. Textbooks remain the main source of information in the learning process that teachers and students want to use. Textbooks or teaching materials can be developed into complementary teaching materials in the form of teaching supplements (Damayanti, 2018). Teaching materials have a very important role in a classroom learning activity. The preparation of material in teaching materials is the most important essence in learning. Which teacher as a facilitator needs to consider the text material that will be used carefully, namely only content that is relevant to the theme or concept being studied (Lasmiyati & Idris, 2014).

The results of the feasibility test by students can be seen in the table below

Table 2. Feasibility Test by Students

Aspect	Indicator	Score (%)
Media Function	When Vape Means Fire teaching supplement helps in learning activities	86.7
Accuracy of media as a teaching supplement	When Vape Means Fire teaching supplement is suitable for use in learning activities	84.2
Interactivity	When Vape Means Fire teaching supplement can attract students' attention and successfully convey messages about the dangers of vape	92.5
Interest in media	Students are interested in using the When Vape Means Fire teaching supplement in learning activities on respiratory system disorders	83.3

Students provided feedback about the media function, the accuracy of the media as a teaching supplement, interactivity and interest in the media. The results of the student responses obtained reached the percentage score that was included in the Very Feasible category, which was 87.33%. During the trial, the students showed a very good and enthusiastic response, seen from their enthusiasm when reading the teaching supplements that were presented because they thought the teaching supplements were very interesting and also very informative.

The indicator "When Vape Means Fire teaching supplements could attract the attention of students and successfully conveyed messages about the dangers of vaping" got the highest percentage score of 92.5%, this shows that students are interested in When Vape Means Fire teaching supplements, and these teaching supplements able to convey messages about the dangers of vaping. While the indicator "Students are interested in using the When Vape Means Fire teaching supplement in learning activities on respiratory system disorders" got the lowest score percentage, which is 83.3%, this is because students on average give a score of 3 on statements with these indicators but the percentage score is still in the Very High category. Students will be more interested in using teaching supplements if there were interesting illustrations namely those contained in the When Vape Means Fire supplement. This is

in line with Aswan's research (2019), which states that the illustrations used in teaching supplements make the reader understand them first so that they create an impression in memory. A good illustration needs to pay attention to the connection of the illustration image with the topic of teaching material supplements (Marsudi & Nanda, 2020).

CONCLUSION

The research-based teaching supplement "When Vape Means Fire" has been developed according to the design which consists of a Cover with the title When Vape Means Fire, Foreword, Table of Contents, List of Pictures, List of Tables, Introduction, Vape Dangers and Nicotine Content, Research Results Vape Hazards, Consequences Vape, Glossary, References and About the Author. Based on the results of the feasibility test by 2 biology teachers at SMA Negeri 1 Bumiayu, it was found that 97.5% and 30 students of class XI MIPA 5 SMA Negeri 1 Bumiayu with a result of 87.3%, both of which were in the Very Feasible category. The feasibility of teaching supplements has been supported from aspects of media function, accuracy of media as teaching supplements, interactivity, interest in media.

ACKNOWLEDGEMENT

Thank you to the Chancellor of Universitas Negeri Semarang who has funded this study through the HIBAH TESIS UNNES and the Head of the Science Education Study Program who has supported the study so that the study runs smoothly until it is finished.

REFERENCES

Aldoobie, N. (2015). ADDIE Model. American International Journal of Contemporary Research, 5(6), 68–72.

Aswan, R. (2019). Tinjauan Elemen Visual Pada Buku Ilustrasi #88 Love Live. Narada : Jurnal Desain Dan Seni, 6(1), 187.

Damayanti. (2018). Kelayakan Media Pembelajaran Fisika Berupa Buku Saku Android pada Materi Fluida Statis. Indonesian Journal of Science and Matematics Education, 1(1), 63–70.

Lasmiyati & Idris. (2014). Pengembangan Modul Pembelajaran untuk Meningkatkan Pemahaman Konsep dan Minat SMP. PYTHAGORAS: Jurnal Pendidikan Matematika, 9(2), 161–174.

Marsudi, U., & Nanda, J. (2020). Analisa Desain Ilustrasi Buku Cerita Anak Tema Sains Biologi Berjudul "Laskar Bakteri Baik." Narada : Jurnal Desain Dan Seni, 7(2), 169.

Putra, A. I., Hanriko, R., & Kurniawaty, E. (2019). Pengaruh Efek Paparan asap Rokok Elektrik Dibandingkan Paparan Asap Rokok Konvensional Terhadap Gambaran Histopatologi Paru Mencit Jantan (Mus musculus) The Effect Of Exposure Elektrical Cigarette Smoke Compared With Cigarette Smoke Conventional On The. Majority, 8(1), 90–94.

Rostika & Prihatini. (2019). Pemahaman Guru Tentang Pendekatan Saintifik dan Implikasinya dalam Penerapan Pembeljaran di Sekolah Dasar. EduHumaniora, 11(1), 86–94.

Widhiarta. 2019. Pemanfaatan E-Learning Sebagai Alternatif Pengganti Pelatihan Tatap Muka Bagi Pendidik Dan Tenaga Kependidikan Pendidikan Nonformal. Jurnal Ilmiah VISI PTK-PNF, 4(2)