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The image shows two screenshots of a Gmail interface. The top screenshot displays an inbox with three emails from 'Young Scholar' (yssssee@radenintan.ac.id). The first email is a 'Certificate' dated 9/29/20. The second is a 'Revision Required' dated 9/21/20. The third is an 'INVOICE' dated 9/11/20. The bottom screenshot shows the 'INVOICE' email open, with the following text: 'Dear author of YSSSEE 2020 International Conference, Along with this e-mail, we want to send the invoice. Thank you for your cooperation. Sincerely yours YSSSEE 2020 Committee'. Below the text is a PDF attachment and three buttons: 'Thank you for your email.', 'Thank you for your mail.', and 'Received, thank you.'. At the bottom, there are 'Reply' and 'Forward' buttons.

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Mon, Aug 31, 2020, 2:55 PM

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Kindly send your revised results by September 3rd, 2020

Sincere Regards,

YSSSEE 2020 Committee

2 Attachments

076-YSSSEEUNRL...  
Template YSSSEE ...

Andi Thahir, MA, Ed. D -andithahir@radenintan.ac.id-  
to Young

Fri, Sep 4, 2020, 11:03 AM

Dear Editor YSSSEE

I submitted a repair article, thank you

Andi Thahir, S.Psi, M.A, Ed.D

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Hee we send you the 2nd review of your manuscript. Please revise this according to the comments. We expect you to send us the results before September 17th, 2020. Thank you

Best regards

YSSSEE 2020 Committee

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Sun, Sep 20, 2020, 4:24 PM

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Best Regards

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**(YSSSEE 2020) Certificate**

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Tue, Sep 29, 2020, 5:00 PM

Dear Presenter,

Thank you for your big contribution as the presenter in the Young Scholar Symposium on Science Education and Environment 2020. We appreciate your involvement in this event. As an expression of our thanks, we give you a Certificate of Appreciation. We hope that this collaboration will continue in the future. Once again, thank you so much.

Best Regards

YSSSEE 2020 Committee

2 Attachments

84- SRI Zahra Buha...  
Andi Thahir.pdf

It was my pleasure! Thank you for your support! Received, thank you.

Reply Forward





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Awarded to

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In the Young Scholar Symposium on Science Education and Environment (YSSSEE) International Conference 2020. Held in UIN Raden Intan and Emersia Hotel, Indonesia, September 22<sup>nd</sup> - 23<sup>rd</sup>, 2020.



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# Respiratory System Materials: Development of Student Worksheets Based on Learning Content Development System (LCDS)

Andi Thahir<sup>1</sup>, Gustina<sup>2</sup>, Siti Zahra Bulantika<sup>3</sup>, Permata Sari<sup>4</sup>, Rubi Rimonda<sup>5</sup>, Tri Dewantari<sup>6</sup>, Yetri<sup>7</sup>

Universitas Islam Negeri Raden Intan, Indonesia

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**Abstract.** This study aims to develop an LCDS-based LKPD on the respiratory system material to help and motivate students in participating in classroom learning. This research is development research using the Borg and Gall research model, with 7 steps, namely the preliminary study, the planning stage, the product development stage, the design validation stage, the testing and revision of the results. The results of this study indicate that the development of an LCDS-based LKPD falls into the very feasible category, and also the system material that can be used easily with instructions for use encourages students to learn maximally, presents interesting and not boring.

**Keywords:** LCDS, Respiratory System, Student Worksheets.

## 1. Introduction

Biology lessons are lessons that are tested rationally and must be given to students who major in science.<sup>1</sup> Biology courses include the study of life, living organisms, structure, function, growth, evolution, distribution, and taxonomy. Biology is a science that studies the life of the world with various aspects, the life of living things, the environment, and the interaction of living things with the environment. In biology, there are various branches of study, one of which is the anatomy and physiology of living things. Living things can include humans, animals, and plants both single-celled and multicellular.

Understanding biology is beneficial for understanding the anatomy and physiology of the human body.<sup>2</sup> For an understanding of the anatomy and physiology of the human body in biological material to be absorbed effectively, it must be supported by the existence of learning media, teaching aids, or teaching materials. Media as a source and learning tool as audio, visual, and audio-visual aids. Apart from learning media, the existence of teaching materials is also very much needed for the learning effectiveness of students.

<sup>1</sup> Marlina Kamelia, Ahmad Ahmad, and Yeni Novitasari, "Pengaruh Strategi Joyful Learning Dengan Teknik Mind Map Terhadap Hasil Belajar Kognitif Peserta Didik Kelas XI IPA SMA Negeri 6 Bandar Lampung," *Biosfer: Jurnal Tadris Biologi* 8, no. 2 (2017): 132–157.

<sup>2</sup> Phillip E. Pack, *Anatomi Dan Fisiologi*, 1st ed. (Bandung: Pakar Raya, 2013).

**Commented [u1]:** Disarankan untuk memodifikasi judul menjadi:  
Respiratory System: A Learning Content Development Sytem-based Student Worksheet in Biology

**Commented [u2]:** Jika satu afiliasi, cukup tuliskan 1 saja

**Commented [u3]:** LKPD?

**Commented [u4]:** A development

**Commented [u5]:** Apa maksud anda dengan system material?

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According to Fitriana, teaching materials are all forms of materials used to help educators or instructors in carrying out learning activities in the classroom. Teaching materials used in the learning process, which are developed according to the needs of educators and students and properly utilized will be one of the important factors that can improve the quality of learning. Improving the quality of learning is a task that must be carried out by educators.<sup>3</sup>

Teaching materials make educators not the only learning resource in the classroom. In this case, the educator acts as a facilitator to direct students in the learning process. So that one of the teaching materials that are still widely used is the Student Worksheet (LKPD). LKPD is the result of technology development that is printed in the form of books and contains visual material, Arsyad argues that LKPD is a hand out that supports students learning directed.<sup>4</sup> Focused learning using LKPD which can train students to find new things and can also be a handbook for educators in addition to other books.

According to Komalasari, LKPD is practice questions that are adapted to learning materials arranged in the form of textbooks. LKPD as a form of material evaluation tool as well as a learning source, in LKPD contains summaries.<sup>5</sup> Understanding learning material is the goal of making LKPD. The purpose of making LKPD is to facilitate educators in delivering learning material. Learning contains knowledge, attitudes, and skills that students must have in carrying out learning activities.<sup>6</sup> Skills in packaging learning and motivating students can be implemented using LKPD. The use of LKPD for educators' answers was not maximal because students were less interested in using LKPD. One of the reasons why students are less motivated is because the LKPD is still in printed form, the presentation is in blurred paper, black and white writing. The appearance and presentation of the LKPD are less attractive, the image misplacement does not match the material, the material is full and solid with very small font size.

Disinterest in learning can be seen from the reactions of all students when educators ask questions from printed LKPD, students pay less attention and are slow to respond. This results in participants feeling bored and sleepy while learning takes place. According to Hastuti, the use of LKPD should be a learning activity for students to improve the quality of learning.<sup>7</sup> In line with this, efforts to build basic abilities that must be carried out by students are contained in a set of activities that are in accordance with the LKPD criteria.<sup>8</sup>

Good LKPD criteria have a title, study instructions, competencies, supporting information such as info, assignments or exercises, work steps, and evaluation. Based on this statement, the researchers analyzed the LKPD that are still in use today using the 2013 curriculum. The result is that there are still many educators who use LKPD at the end of learning with tasks that must be done right away, and a short time so that students have difficulty understanding reading and creative thinking skills do not develop. The LKPD that is presented also has limitations on displays such as images on supporting information that is not colored and the placement of the images is wrong, indicators and learning objectives are not formulated, supporting information and the scope of learning that includes material content that looks so full and dense, causing participant activity students are partially low.

**Commented [u10]:** LKPD itu Bahasa Indonesia, mohon untuk mentranslate dengan benar

<sup>3</sup> Desi Eka Nur Fitriani, Evi Amelia, and Pipit Marianingsih, "Penyusunan Modul Pembelajaran Berbasis Sains Teknologi Dan Masyarakat (Stm) Pada Konsep Bioteknologi (Sebagai Bahan Ajar Siswa SMA Kelas XII)," *Biosfer: Jurnal Pendidikan Biologi* 10, no. 2 (2017): 60–72.

<sup>4</sup> Azhar Arsyad, "Media Pembelajaran" (Jakarta: PT Raja grafindo persada, 2011).

<sup>5</sup> Komalasari Kokom, "Pembelajaran Kontekstual Konsep Dan Aplikasi," *Bandung: PT Refika Aditama* (2014).

<sup>6</sup> Agus Suyatna dan Undang Rosidin Septa Nini Susanti, "Pengembangan Lembar Kerja Siswa (LKS) Berbasis Keterampilan Generik Sains (KGS) Pada Materi Hukum OHM Dan Hukum Kirchoff," *Jurnal Pendidikan Fisika FKIP Unila* (2013): 38.

<sup>7</sup> Dewi Mustikaningtyas dan Arif Widiyatmoko Annisa Aulia Hastuti, "Pengembangan LKS Berbasis Education Game Pada Tema Rokok Dan Kesehatan," *Jurnal Pendidikan IPA UNNES* 3 (2014): 580.

<sup>8</sup> Dira Ayu Annisa, "Pengembangan Lembar Kerja Siswa Pada Materi Teori Tumbukan Berbasis Discovery Learning" (2016).

The problem of developing students' thinking by using printed LKPD can overcome the use of facilities from schools. Facilities and infrastructure such as LCD, wifi, and smartphones can be used in the learning process in the classroom. Schools provide space or computer laboratories, but their utilization is still not optimal, especially in biology lessons. The use of computer laboratories is only used in basic computer lessons, so the use of interactive multimedia in biology lessons is minimal. Learning using interactive multimedia can be tutorials in nature, such as giving exercises and repetitions and simulations. It is said to be interactive because it contains content that is active and experiences interactions with other users who present images, varied writing, animation, and video.<sup>9</sup> So that students' interest in learning and LKPD can be presented electronically using the Learning Content Development System (LCDS).

LCDS is an accessible, high-quality, interactive creation of online learning content. Learning using LCDS makes it easy for educators to convey interactive learning information directly or indirectly.<sup>10</sup> LCDS is a technology that can be used as an attractive learning medium and increases students' interest in learning. LKPD with the use of LCDS becomes the learning support capacity in the classroom. Making LKPD using LCDS is quite easy, namely by compiling LKPD with the available content on the LCSS.

Based on the results of distributing questionnaires to 30 students of class XI MIA 2 at MAN 1 Bandar Lampung, it shows that the use of facilities and infrastructure has been used well, except for computer laboratories in biology learning, and students easily absorb material using audio-visual, multimedia media. interactive. The use of LKPD in class XI MIA is still in printed form, and 80% of students have problems with the worksheets they have used so far. The expected LKPD is in the form of LCDS-based electronics. Students show enthusiasm by directly trying the LCDS application when the researcher introduces it. Given the maximum use of learning facilities, researchers are interested in developing LCDS-based LKPD on respiratory system material to help and motivate students in participating in learning in the classroom.

## 2. Methods

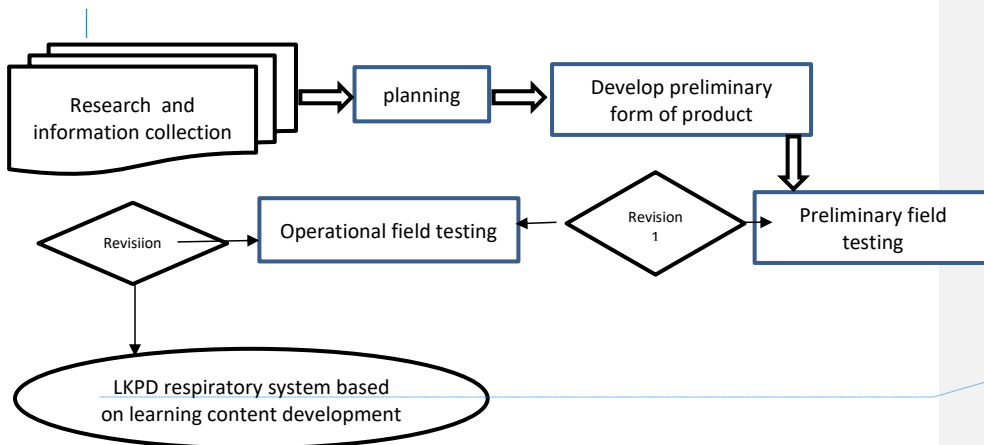
This research and development use a development model from Borg and Gall. Their stages are adjusted to the purpose of this study to produce a product in the form of student worksheets based on learning content development that is feasible in terms of content and format. So that in this study only carried out until the seventh step, namely limited field testing. The research and development steps are described in Figure 1.

**Commented [u11]:** Cantumkan hasil penelitian terdahulu yang juga membahas variable yang sama. Kemudian berikan perbandingan perbedaan penelitian anda dengan penelitian sebelumnya. Apa yang membuat penelitian anda special?

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<sup>9</sup> Asep Sunantri, "Pengembangan Modul Pembelajaran Menggunakan Learning Content Development System Pada Materi Usaha Dan Energi," *Skripsi Program Pendidikan Fisika Jurusan Pendidikan Matematika dan Ilmu Pengetahuan Alam Universitas Lampung* (2016): 10.

<sup>10</sup> Agus Suyatna dan Ismu Wahyudi Yani Suryani, "Pengembangan Modul Pembelajaran Menggunakan Learning Content Development System Materi Gerak Harmonic Sederhana," *Jurnal Pendidikan IPA Indonesia, pendidikan fisika UNILA* (2016): 89.



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Furthermore, the stages carried out in this study began with a preliminary survey. At this stage, the identification of problems in the field was carried out by observing, interviewing, and conducting a need assessment by filling out a questionnaire in MAN 1 Bandar Lampung for class XI MIA students. Besides, literature studies were also carried out to collect material; in this activity, the sub material was the respiratory system. The second stage is planning by preparing the respiratory system material based on the 2013 curriculum from various relevant sources. The third stage is product development; at this stage, making an LCDS-based LKPD initial product design. After the initial design of the food product is formed, a validation test is carried out consisting of media experts, material experts, and language experts. After the validation test was carried out, the researcher revised or improved the product according to the input of the experts. Furthermore, a limited product trial was carried out by conducting a small-scale test involving 30 students and a more extensive scale test with a total of 90 students in three high schools located in Bandar Lampung. After a limited trial was carried out, a second improvement was carried out to obtain a product that was suitable for use.

The data collection instrument used consisted of a media expert rating scale, a material rating scale, a user rating scale, and an LKPD expert rating scale. This scale will measure the acceptance aspects of the respiratory system LKPD. The data obtained are qualitative and quantitative. Qualitative data is input, comments, and criticism about the developed LKPD, while quantitative information is the LKPD assessment score. Quantitative data were analyzed using the calculation of the percentage of relevance items, which would later provide an overview of the agreement between experts and users regarding the developed LKPD.

### 3. Result

Before being given to the user, an assessment of the content/material and format of the respiratory system LKPD is assessed by media experts, material experts, and language experts. The results of the assessment are described in table 1.

**Commented [u14]:** Buatlah storyboard yang berisi bagian-bagian lkpd dengan penjelasannya



Table 1  
Expert and User Test Assessment

Expert	Before the Revision	After the Revision	Final criteria
Media	63.23%	85.29%	Very worthy
Theory	61.54%	75%	Well worth it
Language	70.83%	88.89%	Very worthy
Teacher	-	76.75%	Well worth it

In table 1, it is known that the final result of the product assessment, according to media experts, is 85.29%, which falls into the very feasible criteria. The material expert's assessment is 75%, which is in the feasible category. The linguist's assessment was 88.89%, and it was included in the very feasible criteria. This shows that this book fulfills the acceptability aspect so that an assessment is carried out from the user, namely three biology teachers with 76.75% results and is included in the feasible category.

In addition to data in the form of a percentage of eligibility, input from experts was also obtained in the way of information, criticism, and suggestions described in table 2.

Table 2  
Revised Expert and User Ratings

Expert	Input	Revision
Media	Change the design from portrait to landscape orientation	It was changed to landscape with a more attractive appearance and color.
Theory	Match the image to the material	Images in the respiratory system are explained to make it more transparent. The breathing flow is also drawn with a diagram

After assessing and improving the product, a small group is tested for feasibility. The first short group test was conducted on 30 students, and the second small group test was carried out on 90 students. The results of the feasibility test are presented in Figure 2.

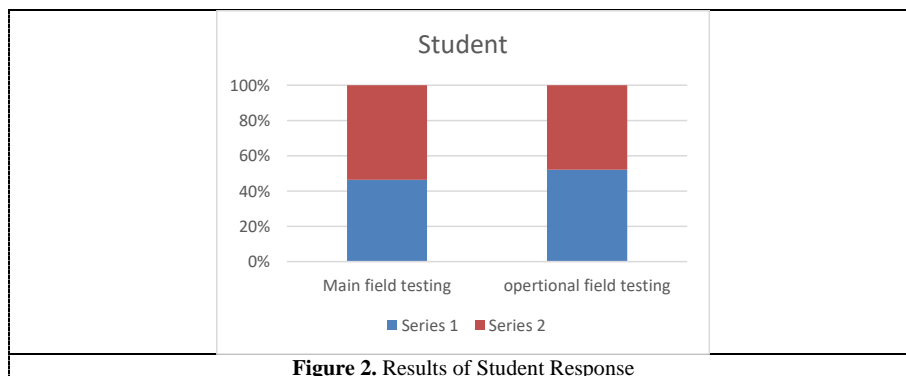


Figure 2. Results of Student Response

Based on the results of the small test, it is known that the percentage obtained is 80.48% in the SL criteria. In the broad-scale test carried out in 3 school places, namely MAN 1 Bandar Lampung, YP UNILA Bandar Lampung SMA, and SMA AL-AZHAR 3 Bandar Lampung, which is as many as 90 students obtained a percentage of 81.45% and expressed in SL criteria. The purpose of carrying out this small-scale test and the wide-scale test is to determine the feasibility of the LCDS-based LKPD on the respiratory system material. Based on the results of the response, it can be seen that the LCDS-based Student Worksheet on the Respiratory System Material is stated in the SL criteria to be used in teaching activities.

#### 4. Discussion

The suitability of the resulting product for research and development purposes is presented in a discussion with the revised product. The aim of the researcher in developing this research and development product is to produce an LCDS-based LKPD in the respiratory system material in a more attractive, comfortable, useful, and practical way as a learning resource.

The implementation of this research is in MAN 1 Bandar Lampung, YP UNILA SMA Bandar Lampung, and SMA AL-AZHAR 3 Bandar Lampung in class XI IPA students. The model used in the development of Borg and Gall developed by Sugiyono, which consists of 7 stages, namely preliminary studies and literature, planning in research, initial research product design, product testing before revision, product revision, product testing of the initial correction, revision. This statement is similar to research carried out by Asep Sunantri, Agus Suyatna, and Undang Rosidin in 2016.<sup>11</sup>

Products developed can be in the form of teaching materials or media such as interactive multimedia. Learning activities that are used in an optimization manner as a form of information technology are referred to as interactive multimedia.<sup>12</sup> The use of interactive multimedia as a learning activity can make learning directed, effective, and able to improve student learning achievement.<sup>13</sup> One of the interactive multimedia used in this study is LKPD. The LKPD developed aims to solve the learning problems of students; the learning base that is deemed appropriate is to use the learning content development system application. According to AREMU Microsoft LCDs, which is software from Microsoft in the publication of electronic learning programs, LCDS is also not too difficult in its use to its users so that it produces customized, high-quality and interactive content that contains quizzes, animations, demos, and other multimedia.<sup>14</sup> Thus it was concluded by Iqbal and Dani in 2013 which stated that LCDS is software that can be accessed online and offline as well as of high quality and interactive, which makes it easy to create learning content.<sup>15</sup>

The unique characteristic of this developed product, namely the LCDS-based LKPD, is easy to use because it can be accessed online and offline, interesting because, in its use, it can combine videos, animations, images, and evaluation questions in one content. This statement is similar to the research conducted by Yani Suryani et al. that the LCDS-based LKPD, which is equipped with learning videos, animations, and images, can make students think more thoroughly about the material presented. Students who are enthusiastic and active in digesting the video display or animation shown on LKPD based

<sup>11</sup> Asep Sunantri, Agus Suyatna, and Undang Rosidin, "Pengembangan Modul Pembelajaran Menggunakan Learning Content Development System Materi Usaha Dan Energi," *Jurnal Pembelajaran Fisika* 4, no. 1 (2016).

<sup>12</sup> Rangga Sanjaya, "Multimedia Interaktif Pelatihan Service Excellent Menggunakan Pendekatan Story Based Learning," *Jurnal Informatika* 3, no. 1 (2016).

<sup>13</sup> Claudia Citra, "Implementasi Modul Pembelajaran Berbasis Learning Content Development System Terhadap Penguasaan Konsep Siswa SMA Materi Usaha Dan Energi" (FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN, 2017).

<sup>14</sup> Ayotola Aremu and Bamidele Michael Efuwape, "A Microsoft Learning Content Development System (LCDS) Based Learning Package for Electrical and Electronics Technology-Issues on Acceptability and Usability in Nigeria," *American Journal Of Education Research* 1, no. 2 (2013): 41-48.

<sup>15</sup> Dani Rusda Taufani and Mohamad Iqbal, "Membuat Konten E-Learning Dengan Microsoft Learning Content Development System (LCDS)," *Bandung: Universitas Komputer Indonesia* (2011).

LCDS.<sup>16</sup> Furthermore, the research conducted by Luh Sri Asmarani Suradnya stated that with the addition of interactive evaluation questions, students said that it made the LCDS-based LKPD more enjoyable to use because students could immediately know the answers and scores on questions with a choice of right or wrong answers. Besides, the LCDS-based LKPD is equipped with the user manual contained on the home page. Therefore it can be used easily by users.<sup>17</sup> In this case, the user referred to by the researcher is a class XI IPA student.

After knowing the character of the LKPD that will be developed, then the type of data to be obtained can be in the form of quantitative data and also qualitative data. This statement is similar to the research conducted by Abdul Ghofur and Rudy Kustijono in 2015.<sup>18</sup> The type of data used is qualitative data, namely, data made descriptively, while quantitative data is data that is made in the form of numbers.<sup>19</sup> Agree with research that has been carried out by Adi Pratomo and Agus Irawan in 2015 that for the manufacture of the instrument used to gain knowledge, namely information in product development will then be shared with users or respondents.<sup>20</sup> The product eligibility criteria in the form of SL (very feasible), L (feasible), CL (quite feasible), TL (not feasible), and STL (very improper) results were obtained from the validation result data then averaged to get the final result. Furthermore, for the scale that the researcher uses, the Likert scale. Agree with other research which says that the validation instrument is prepared with 4 answer choices, namely: 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree.<sup>21</sup>

To test the feasibility of an LCDS-based LKPD on respiratory system material, it is first validated by experts. According to Daryanto in the journal Akbar Handoko, the mastery of learned competencies can be done by asking for help from validation experts.<sup>22</sup> Furthermore, the statement by Ismu Fatikhah that validation is based on rational thinking by providing an assessment of the product design being developed.<sup>23</sup> In this study, there were three expert validators, namely material experts, linguists, and media experts. So that the requirements for being used as a validator are undergraduate or postgraduate education in their field as needed.

Data results from the average eligibility obtained in a smaller scale test, namely with a total of 30 students as respondents from each of the three schools, namely in MAN 1 Bandar Lampung, YP UNILA SMA Bandar Lampung, and SMA AL-AZHAR 3 Bandar Lampung can be obtained. With an average score of 80.48%, this result places LCDS-based LKPD in the "Very Appropriate" criterion. The trial that was carried out was more extensive, which was followed by students with a total of 90 students, there was an average score of 81.45% with the criteria "Very Feasible". This is by previous research conducted by Allita Cahyani, I Dewa Putu Nyeneng and Eko Suyanto, who obtained the results of the

<sup>16</sup> Yani Suryani, Agus Suyatna, and Ismu Wahyudi, "Pengembangan Modul Pembelajaran Menggunakan Learning Content Development System Materi Gerak Harmonik Sederhana," *Jurnal Pembelajaran Fisika* 4, no. 3 (2016).

<sup>17</sup> Luh Sri Asmarani Suradnya, Eko Suyanto, and Wayan Suana, "Modul Interaktif Dengan Program LCDS Untuk Materi Cahaya Dan Alat Optik," *Jurnal Pembelajaran Fisika* 4, no. 2 (2016).

<sup>18</sup> Abdul Ghofur, "Pengembangan E-Book Berbasis Flash Kvisoft Flipbook Pada Materi Kinematika Gerak Lurus Sebagai Sarana Belajar Siswa SMA Kelas X," *Inovasi Pendidikan Fisika* 4, no. 2 (2015).

<sup>19</sup> Sitty Rahmi Lasena, "Analisis Penentuan Harga Pokok Produksi Pada PT. Dimembe Nyiur Agripro," *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis dan Akuntansi* 1, no. 3 (2013).

<sup>20</sup> Adi Pratomo and Agus Irawan, "Pengembangan Media Pembelajaran Interaktif Berbasis Web Menggunakan Metode Hannafin Dan Peck," *Positif* 1, no. 1 (2015): 159673.

<sup>21</sup> Putri Rahayu Wulan Sari, "Pengembangan Lembar Kerja Siswa (LKS) Dengan Model Problem Based Learning (PBL) Pada Materi Fluida Statis" (2016).

<sup>22</sup> Akbar Handoko, Sajidan Sajidan, and Maridi Maridi, "Pengembangan Modul Biologi Berbasis Discovery Learning (Part of Inquiry Spectrum Learning-Wenning) Pada Materi Bioteknologi Kelas XII IPA Di SMA Negeri 1 Magelang Tahun Ajaran 2014/2015," *INKUIRI: Jurnal Pendidikan IPA* 5, no. 3 (2016): 144-154.

<sup>23</sup> Nurma Izzati, "Pengembangan Modul Pembelajaran Matematika Bermuatan Emotion Quotient Pada Pokok Bahasan Himpunan," *Eduma: Mathematics Education Learning and Teaching* 4, no. 2 (2015).

feasibility of developing LCDS-based teaching materials with the attractiveness, ease, and effectiveness of products as much as 85.29% and students completing KKM after reaching >75%.<sup>24</sup>

In this case, the LCDS-based LKPD that the researcher developed received a positive response by students as users, including 1) LCDS-based Student Worksheets are exciting to use and can provide direct experience to students, 2) students think LCDS-based LKPD can increase independence in carrying out learning.

Research conducted by researchers from the three high schools in Bandar Lampung received a positive response and was worthy of use. So that in various cases before carrying out this research, researchers sought information from numerous previous studies. The results of prior research developed LKPD, which showed integration between biological material, especially the respiratory system, with chemicals, especially nicotine, which is found inactive substances in cigarettes. Then other research developed LKPD with the attractiveness, convenience, usefulness, and effectiveness of the product.<sup>25</sup>

Furthermore, other research develops LKPD with process-oriented skills so that it can be applied in the learning process, describes the implementation of the learning process, the level of readability by students, and can know the completeness of students' learning outcomes after using this LKPD.<sup>26</sup> Furthermore, another study developed LKPD with the STAD Type method.<sup>27</sup> Another research developed using LCDS on mathematical number patterns material.<sup>28</sup> Furthermore, other research has also developed LCDS in science studies, which show that the products that are developed are attractive, easy to use, and of great benefit for educators and students.<sup>29</sup> It can be concluded from the above discussion that in this study, LKPD can be developed with various innovations as learning materials and media for students.

## 5. Conclusions

Based on the data from the results of the research and discussion described in chapter IV above, it can be concluded that the LKPD development is based on the learning content development system (LCDS) on the respiratory system material. has characteristics: (1) LCDS-based LKPD is easy to use. (2) LKPD based on LCDS is exciting and helps to understand the material. (3) LCDS-based LKPD is easy to use because there are instructions for use. The results of the assessment by media experts, material experts, and linguists on the LCDS-based LKPD fall into the category of "Very Appropriate: with an average score of 85.29%, 75%, and 88.89%. The development of student worksheets based on learning content development (LCDS) on the respiratory system material received an assessment of responses with a percentage of 81.45% with the criteria "Very Appropriate" by the responses of students, and a "Feasible" assessment was obtained based on the assessment of biology educators with a percentage of 77.41%.

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<sup>24</sup> Alitta Cahyani, I Dewa Putu Nyeneng, and Eko Suyanto, "Pengembangan Modul Pembelajaran Menggunakan LCDS Pada Materi Hukum Newton Tentang Gravitasi," *Jurnal Pembelajaran Fisika* 4, no. 1 (2016).

<sup>25</sup> Rosita Wati, Agus Suyatna, and Ismu Wahyudi, "Pengembangan LKS Berbasis Inkuiri Terbimbing Untuk Pembelajaran Fluida Statis Di SMAN 1 Kotaagung," *Jurnal Pembelajaran Fisika* 3, no. 2 (2015).

<sup>26</sup> R KURAINI MASITHUSSY, "Pengembangan Lembar Kegiatan Siswa (LKS) Berorientasi Keterampilan Proses Pada Pokok Bahasan Sistem Pernapasan Manusia," *BioEdu* 1, no. 1 (2012).

<sup>27</sup> Syafrimen Syafril and Titik Rahayu Yantikno, "Pengembangan Lembar Kerja Siswa (LKS) IPA Terpadu Menggunakan Metode Kooperatif Tipe STAD Di Sekolah Menengah" (2016).

<sup>28</sup> Iin Rahmatul Ula and Abi Fadila, "Pengembangan E-Modul Berbasis Learning Content Development System Pokok Bahasan Pola Bilangan SMP," *Desimal: Jurnal Matematika* 1, no. 2 (2018): 201–207.

<sup>29</sup> Deny Kurniawan, Agus Suyatna, and Wayan Suana, "Pengembangan Modul Interaktif Menggunakan Learning Content Development System Pada Materi Listrik Dinamis," *Jurnal Pembelajaran Fisika* 3, no. 6 (2015).

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