Journal of Education and Learning Research
Journal homepage: https://jelr.greadc.org/index.php/jelr

E-ISSN 3024-9589

Development of Science Literacy-Based E-Booklet Accompanied by Mind Mapping on Human Digestive System Material

Virdana Paduwinata, Ana Yuniasti Retno Wulandari*, Badrud Tamam, Eva Ari Wahyuni, Try Hartiningsih

Natural Science Education Study Program, University of Trunojoyo Madura, Bangkalan, East Java, 69162, Indonesia

ARTICLE INFO

Article history:

Received: 27 June 2024
Revised: 02 July 2024
Accepted: 04 July 2024
Published online: 10 Aug 2024

Keywords:

E-Booklet;
Mind Mapping;
Science Literacy

* *Corresponding author.*
E-mail: ana.wulandari@trunojoyo.ac.id

Article Doi

Doi: https://doi.org/10.62208/jelr.2.1.p.19-27

A B S T R A C T

E-Booklet based on science literacy accompanied by mind mapping is a form of the diversity of learning products that can be aligned with the development of technology and information. The purpose of this study aimed to determine the feasibility, response, and readability of a science literacy-based e-booklet accompanied by mind mapping on human digestive system material. This type of research is development research with the ADDIE model without the implementation phase. The research subjects included 31 students of class VIII-A and 13 students of class VIII-B. Based on the research that has been done, the average results of the media aspect feasibility test assessment were validity of 1 with a valid category, 92.2% reliability with a very reliable category, and a material aspect validity of 0.99 with a valid category, 100% reliability with a very reliable category. The results of the assessment of student responses and readability of the e-booklet obtained a very good category. It concluded that the use of science literacy-based e-booklets accompanied by mind mapping on human digestive system material is feasible to use in learning.

1. Introduction

The development of the times is directly proportional to progress and innovation in the field of Science and Technology (IPTEK). The millennial era, where everything can be accessed easily, makes the use of gadgets inseparable from everyday life, one of which is by students. Using devices according to their functions, such as learning resources to find learning materials, can help students in their learning process. This condition applies not only to apply when students study independently but also during the teaching and learning process at school. Using devices in the learning process can help students deepen their science literacy skills (Ati et al., 2022).

Organization for Economic Co-operation and Development (OECD) states that science literacy is the ability to use scientific knowledge in making decisions about natural phenomena through the stages of identifying problems and drawing conclusions based on facts carried out by humans (Fuadi et al., 2020). The results of the PISA survey from 2000 to 2018 placed Indonesia as one of the

countries with low levels of science literacy. One of the factors causing the lack of student science literacy is the use of teaching materials with learning material content without being associated with phenomena that occur in the surrounding environment (Narut & Supradi, 2019).

Based on the results of interviews conducted with science teachers, it is found that teaching materials originating from the government have several areas for improvement, such as containing a lot of writing and lack of feedback to students. This forgets that there is a diversity of teaching materials that can expand students' understanding and science literacy skills. Learning materials that can be developed and accumulated are used to present attractive displays and are equipped with photos, images, and even animated videos. One of these learning materials is an e-booklet (Asnawati et al., 2021; Sholeh & Basuki, 2019).

The application of e-booklet can be combined with the use of application technology, namely Canva. E-Booklet can be equipped with mind mapping so that students easily understand the description of the material presented in the e-booklet. Mind mapping is made by bringing up the main branches in the material accompanied by different colors and image insertions for each keyword to strengthen memory (Panggabean et al., 2020). Based on the student needs analysis questionnaire, it was found that students found it difficult when acquiring human digestive system material because of the large amount of material in it. The complex digestive system material causes students to have difficulty understanding and memorizing essential parts of the material (Dewi et al., 2021).

Based on the background description above, it is necessary to develop a learning product. The development in question is the development of a science literacy-based e-booklet accompanied by mind mapping on human digestive system material. This results is in line with previous research stating that science literacy-based and mind mapping-based modules can facilitate and be an alternative for teachers and students in the learning process (Sujiani et al., 2022; Wahab et al., 2021). Based on the above background, the objectives of this study are to determine the feasibility, response, and readability of a science literacy-based e-booklet accompanied by mind mapping on human digestive system material. The development of the times is directly proportional to progress and innovation in the field of Science and Technology (IPTEK). The millennial era, where everything can be accessed easily, makes the use of gadgets inseparable from everyday life, one of which is by students. Using devices according to their functions, such as learning resources to find learning materials, can help students in their learning process. This condition applies not only to apply when students study independently but also during the teaching and learning process at school. Using devices in the learning process can help students deepen their science literacy skills (Ati, 2022).

Organization for Economic Co-operation and Development (OECD) states that science literacy is the ability to use scientific knowledge in making decisions about natural phenomena through the stages of identifying problems and drawing conclusions based on facts carried out by humans (Fuadi, 2020). The results of the PISA survey from 2000 to 2018 placed Indonesia as one of the countries with low levels of science literacy. One of the factors causing the lack of student science literacy is the use of teaching materials with learning material content without being associated with phenomena that occur in the surrounding environment (Narut & Supradi, 2019).

Based on the results of interviews conducted with science teachers, it is found that teaching materials originating from the government have several areas for improvement, such as containing a lot of writing and lack of feedback to students. This forgets that there is a diversity of teaching materials that can expand students' understanding and science literacy skills. Learning materials that can be developed and accumulated are used to present attractive displays and are equipped with photos, images, and even animated videos. One of these learning materials is an e-booklet (Asnawati et al., 2021; Sholeh & Basuki, 2019).

The application of e-booklet can be combined with the use of application technology, namely Canva. E-Booklet can be equipped with mind mapping so that students easily understand the description of the material presented in the e-booklet. Mind mapping is made by bringing up the main branches in the material accompanied by different colors and image insertions for each keyword to strengthen memory (Panggabean et al., 2020). Based on the student needs analysis questionnaire, it was found that students found it difficult when acquiring human digestive system material because of the large amount of material in it. The complex digestive system material causes students to have difficulty understanding and memorizing essential parts of the material (Dewi et al., 2021).

Based on the background description above, it is necessary to develop a learning product. The

development in question is the development of a science literacy-based e-booklet accompanied by mind mapping on human digestive system material. This results is in line with previous research stating that science literacy-based and mind mapping-based modules can facilitate and be an alternative for teachers and students in the learning process (Sujiani et al., 2022; Wahab et al., 2021). Based on the above background, the objectives of this study are to determine the feasibility, response, and readability of a science literacy-based e-booklet accompanied by mind mapping on human digestive system material.

2. Methodology

The research was conducted in class VIII-A with 31 students and class VIII-B with 13 students in the even semester of the 2022/2023 school year. This type of research is pure development research with the ADDIE model without the implementation phase. The steps in the ADDIE development model carried out are Analyze, Design, Develop, and Evaluate. The analysis phase is carried out on several aspects, including gap analysis in learning, goal analysis, student analysis, analysis of resources that can be used, and material analysis. Gap analysis in learning aims to obtain statements related to a problem through interviews with science teachers. Analysis of objectives in the form of determining learning objectives that are adjusted to Bloom's taxonomy and contain audience, behavior, condition, and degree components. Student analysis is done by giving questionnaires to students. Analysis of resources that can be used is obtained through interviews with science teachers, and material analysis is carried out based on Basic Competencies (KD) through making concept maps.

The design phase includes creating flowcharts and storyboards. The development phase includes content creation, validation, one-to-one trial, small-group, and large-group tests. The implementation phase in this study did not take place. The evaluation phase includes formative evaluation in the form of suggestions for improvement in each research phase. The test subjects in this study included three students of class VIII-B (one-to-one trial), ten students of class VIII-B (small-group test), and 31 students of class VIII-A (large-group test). The type of data is interval data. The research instruments used include media validation sheets, material validation sheets, science teachers, student response questionnaires, and readability questionnaires. Data collection techniques include interviews, questionnaires, and documentation. Data analysis techniques include expert validity test analysis, expert reliability test analysis, student response questionnaire analysis, and readability questionnaire analysis made in the form of a Likert scale. The validity results obtained were then calculated using Aiken's V formula to determine the validity of the e-booklet with the following formula (Irman & Waskito, 2020).

$$V = \frac{\sum s}{[n(c - 1)]}$$

Information:
s = r – lo
n = number of assessment panels
lo = lowest validation rating number (1)
c = highest validation rating number (4)
r = the number given by the validator

The validity test results were then analyzed to determine the validity level of the e-booklet using Table 1.

Table 1. Validity Criteria

Interval	Description
V ≥ 0,61 – 1,00	Valid
V < 0,61	Invalid

(Source: Irman & Waskito, 2020)

The following data analysis technique is expert reliability analysis to determine the level of reliability of the e-booklet through calculations using the Borich method known as Percentage of Agreement (PA). The PA calculation to determine the reliability value (Astuti et al., 2021).

$$PA = \left(1 - \frac{A - B}{A + B}\right) \times 100\%$$

Information:
PA = instrument reliability
A = highest assessment score from the validator
B = low assessment score from the validator

The reliability test results were then analyzed to determine the level of reliability of the e-booklet using Table 2.

Table 2. Reliable Criteria

Interval	Description
0 ≤ PA ≤ 40	Less Reliable
40 < PA ≤ 60	Moderately Reliable
60 < PA ≤ 80	Reliable
80 < PA ≤ 100	Very Reliable

(Source: Wardhani, 2018)

The following data analysis technique is the analysis of student response questionnaires to determine student responses to e-booklet. The student response

questionnaire assessment of the e-booklet is calculated using the following formula (Hapsari & Zulherman, 2021).

$$P = \frac{F}{N} \times 100$$

Information:
P = percentage
F = number of respondents' answers
N = maximum number of respondents

The criteria for assessing students' responses to the e-booklet can be seen in Table 3.

Table 3. Student Response Assessment Criteria

Percentage (%)	Category
75 < P ≤ 100	Very Good
50 < P ≤ 75	Good
25 < P ≤ 50	Less Good
0 ≤ P ≤ 25	Not Good

(Source: (Mardiah et al., 2018)

The last data analysis is the readability questionnaire analysis to determine whether the e-booklet has good readability for readers. The readability questionnaire analysis was calculated using the following formula (Sugianto et al., 2018).

$$\bar{R} = \frac{T_{sp}}{T_{sm}} \times 100\%$$

Information:
$\bar{R}$ = average value
T_{sp} = number of scores obtained
T_{sm} = maximum number of scores
The percentage criteria for readability of science literacy-based e-booklet accompanied by mind mapping can be seen in Table 4.

Table 4. Criteria for Readability Percentage

Percentage (%)	Category
75 < P ≤ 100	Very good/very interesting
50 < P ≤ 75	Good/interesting
25 < P ≤ 50	Fairly good/quite interesting
0 ≤ P ≤ 25	Not good/not interesting

(Source: Sugianto et al., 2018)

3. Results and Discussion

The science literacy-based e-booklet accompanied by mind mapping as support for the human digestive system material was developed with the ADDIE development model without the implementation phase. The following are the results of each ADDIE phase that has been carried out. The first phase is analysis. The analysis phase includes several aspects, including gap analysis in learning, goal analysis, student analysis, analysis of resources that can be used, and material analysis.

The first analysis is gap analysis in learning. Based on the results of the interview, it was found that the teaching materials from the government had several shortcomings, such as containing a lot of writing and a lack of feedback to students. The interview results were supported by Sulistyosari (2018), who stated that the use of teaching materials from the government is less effective in learning by looking at the diversity of student characteristics. This results are also supported by Sriwahyuni et al. (2019), who state that teaching materials should be adapted to the development of Science and Technology (IPTEK), and innovations can be made that lead to ease of access and provide enlightenment and intelligence. The second analysis is goal analysis. The results of the goal analysis, namely the learning objectives in the e-booklet, follow Bloom's taxonomy as well as the audience, behavior, condition, and degree components (Adha et al., 2021).

The third analysis is student analysis. The results of student analysis include students find it difficult when obtaining human digestive system material because of the large amount of material in it, students like science learning that is associated with surrounding phenomena, students tend to dislike learning with the lecture method, students like science learning that is related to the use of gadgets, and students like teaching materials that contain interesting animated images and videos. This result is in line with Thorndike's behaviorism learning theory which states that students are said to learn if there is a change in behavior due to stimulus and response. The stimulus, in this case, can be the use of teaching materials in the learning process to determine students' responses (Hermansyah, 2020).

The fourth analysis is the analysis of resources that can be used. The analysis results of resources that can be used include Wi-Fi, devices, Canva platforms, and Mindomo applications that students can use in the learning process. This result is in line with Sarip et al. (2022), which state that one of the resources that can be used in the learning process is the internet network. This is harmonized with the use of learning products such as e-booklet.

The fifth analysis is the material analysis of the Basic Competencies (KD) used in the e-booklet. The Basic Competencies used in this study are KD 3.5, analyzing the digestive system in humans and

understanding disorders associated with the digestive system, as well as efforts to maintain a healthy digestive system. The use of human digestive system material is because many material components can be related to phenomena that occur in the surrounding environment, so the systematic preparation of e-booklet based on Basic Competencies can provide new learning experiences to students through the use of e-booklet (Delfita et al., 2018). The second phase is the design phase. The design in this study was made using a flow chart as a form of initial design regarding the product being made, as well as making e-booklet designs through storyboards (Cahyadi, 2019). The storyboard in this study was created using Canva. Canva is a platform for various infographic needs that are accessed online for free and paid and can be operated on devices and computers (Purba & Harahap, 2022).

The third phase is the development phase. The development phase in this study includes content creation, validation, one-to-one testing, small-group testing, and large-group testing. The first stage of content creation is making mind mapping used with the help of the Mindomo application. The second stage is combines the components presented in the e-booklet with the support of the Canva application. The last stage is converting the e-booklet to become a product that can be operated on a device in the form of a link and contains website links and animated videos on YouTube.

Figure 1. Making Mind Mapping

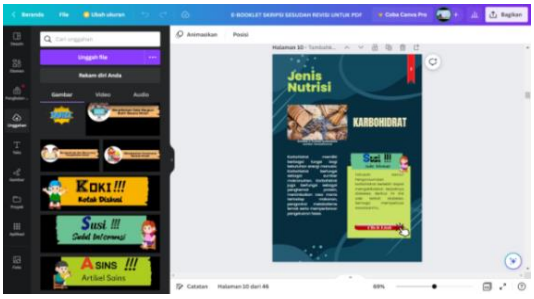

Figure 2. Combination of Components in the E-Booklet

Figure 3. Converting the E-Booklet to HTML Link Format

The next stage in the development phase is to conduct validation related to the science literacy-based e-booklet accompanied by mind mapping from media and material aspects before being tested on students. Media validation was carried out by two experts, namely Mr. Dwi Bagus Rendy Astid Putera, S.Pd., M.Pd as a lecturer in the Science Education study program at Trunojoyo University Madura and Mrs. Da'watul Khoiroh, M.Pd as a science teacher at UPTD SMPN 5 Bangkalan. The results of the assessment of literacy-based e-booklet accompanied by mind mapping in the media aspect can be seen in Table 5.

Table 5. Recapitulation of Media Feasibility Assessment

No	Assessment Aspect	Expert	Average Assessment Score	
			Validity	Reliability (%)
1.	Size of E-Booklet	Media Science Teacher	0,915	93%
2.	Cover Design of E-Booklet	Media Science Teacher	0,90	92%
3.	Content Design of E-Booklet	Media Science Teacher	0,88	91,6%
	Average		0,9	92,2%
	Assessment Criteria		Valid	Very Reliable

Based on the results of the assessment analysis related to the validation of science literacy-based e-booklet accompanied by mind mapping for media aspects, the average score was 0.9 with a valid category, and the reliability obtained an average percentage score of 92.2% with a very reliable category. Based on these data, science literacy-based e-booklet accompanied by mind mapping are declared feasible for use in the learning process. This result is supported by Ariyanti et al. (2022), who

stated that e-booklet have a form that tends to be small in size with practical and flexible properties, so it is feasible to use in the learning process. E-Booklet are varied, following Ausubel's opinion, which states that presenting images and videos about surrounding phenomena can make students associate new knowledge with previously received knowledge to create a meaningful learning process. The next validation is material validation by two experts, namely Mr. Dr. Yamin, S.Pd.I., M.Pd as a lecturer in the Science Education study program at Trunojoyo University Madura, and Mrs. Da'watul Khoiroh, M.Pd as a science teacher at UPTD SMPN 5 Bangkalan. The results of the assessment of the literacy-based e-booklet accompanied by mind mapping on the material aspect can be seen in Table 6.

Table 6. Recapitulation of Material Feasibility Assessment

No	Assessment Aspect	Expert	Average Assessment Score	
			Validity	Reliability (%)
1.	Content Feasibility	Media Science Teacher	1	100%
2.	Presentation Feasibility	Media Science Teacher	0,97	100%
3.	Language Feasibility	Media Science Teacher	1	100%
Average			0,99	100%
Assessment Criteria			Valid	Very Reliable

Based on the results of the assessment analysis related to the validation of a science literacy-based e-booklet accompanied by mind mapping for the material aspect, the average score is 0.99 with a valid category, and reliability obtains an average percentage score of 100% with a very reliable category. Based on this data, the material presented in the e-booklet follows the basic competencies, namely KD 3.5, analyzing the digestive system in humans and understanding disorders associated with the digestive system, as well as efforts to maintain a healthy digestive system. Based on this, the e-booklet is also suitable for use in the learning process. This result is supported by Aritonang et al. (2022) stated that what needs to be considered in a learning product is the suitability between the competencies and objectives to be achieved through the use of the product made. The e-booklet presents a brief and simple description of the discussion by paying attention to sentences suitable for students' understanding and cognitive development. This result is supported by Muharni et al. (2022), who stated that the use of good language in e-booklet makes it easier for students to understand the material and avoid misinterpretation of information or misconceptions.

The next stages of the development phase are a one-to-one trial, small-group test, and large-group test. The respondents used in the one-to-one trial were three students of class VIII-B, and the small-group test was ten students of class VIII-B, where students who had acted as respondents in the one-to-one trial were not included in the small-group test respondents. Respondents used in the large-group test were 31 students of class VIII-A. Students as respondents filled out a response and readability questionnaires after using the e-booklet. The results of student response data in the one-to-one trial, small-group, and large-group can be seen in Table 7.

Table 7. Recapitulation of One-to-One Trial, Small-Group, and Large-Group Student Responses

No.	Aspects	One-to-One Trial	Small-Group	Large-Group
1.	Quality of Content and Purpose	91,7%	96,25%	91,7%
2.	Engineering Quality	87,5%	93,44%	89,7%
3.	Quality of Learning	88,33%	95,75%	90,14%
Total Average		89,2%	95,15%	90,5%
Criteria		Very Good	Very Good	Very Good

Based on the data in Table 7 above, it is known that the e-booklet received a very good response from students. This result is evidenced by the average percentage in the one-to-one trial of 89.2%; small-group test of 95.15%; and large-group test of 90.5%. This result is supported by Hanifah et al. (2020), who stated that e-booklet could help students to learn independently to create a pleasant atmosphere, wherein not only material is presented, but pictures, mind mapping, videos, and practice questions (quizzes). The presentation of mind mapping in the e-booklet makes it easier for students to remember complex material to be more concise. This result is supported by Riska et al. (2023), who stated that mind mapping helps students recognize and see the entire content of the material presented. Mind mapping is a mind mapping technique through the relationship and relationship of a topic with other sub-topics to form a hierarchy (Darmuki et al., 2020). Through the use of e-booklet, students can involve themselves in learning activities. This result is supported by Piaget's constructivism theory which

states that students can improve their understanding of a concept in learning material through their participation in learning (Waseso, 2018). Furthermore, students filled out the readability questionnaire. The results of the readability data on the one-to-one, small-group, and large-group can be seen in Table 8.

Table 8. Recapitulation of Readability of One-to-One Trial, Small-Group, and Large-Group

No.	Aspects	One-to-One Trial	Small-Group	Large-Group
1.	Short Length of the Sentence	79,15%	98,1%	88,1%
2.	Word Difficulty Level	81,95%	97,5%	91%
3.	Linguistic	75%	98,1%	90,5%
Total Average		78,7%	97,9%	89,9%
Criteria		Very Good	Very Good	Very Good

Based on the data in Table 8, it is known that the science literacy-based e-booklet accompanied by mind mapping on the material of the human digestive system developed is very well read and interesting by students with an average percentage including in the one-to-one trial of 78.7%; small-group test of 97.9%; and a large-group test of 89.9%. E-Booklet based on science literacy with mind mapping have clear writing and are easy for students to understand. E-Booklet based on science literacy accompanied by mind mapping uses language adapted to students' level of thinking and age. This result is supported by Muharni et al. (2022), who stated that simple and concise language makes it easy for students to understand the material presented in the e-booklet to minimize the occurrence of material misconceptions. E-Booklet, in its presentation, uses an attractive writing style or font and is appropriate by paying attention to its appearance in the e-booklet. This result is supported by Sarip et al. (2022), who state that the presentation of writing in an e-booklet must pay attention to the distance between words or sentences so that they are not too tight or too tenuous and that it does not make difficult for students to understand the material presented. The last phase is the formative evaluation phase. Formative evaluation is input and suggestions for improvement from testers, validators, and students. The evaluation carried out in this study can be seen in Table 9.

Table 9. Results of the Evaluation Phase in the Conducted Research

Phase	Evaluation
Analyze	No revisions
Design	No revisions
Development	Some revisions include a dot on the table of contents, presentation of the number of calories in food and drinks, improvement of the form of mind mapping, the addition of surrounding phenomena related to the material, and changes in the background color of the e-booklet to make it a little brighter.

The advantages of the developed e-booklet include being practical and flexible to use anywhere and anytime, having a book-like appearance but in digital form, covering all discussions on human digestive system material, and having varied components. The disadvantage of this e-booklet is the need for an internet network to operate it.

4. Conclusion

Based on the description above, it can be concluded that the development of a literacy-based e-booklet accompanied by mind mapping on the material of the human digestive system has answered the problem and is following the research objectives. The developed e-booklet is declared suitable for use in the learning process. This result is evidenced by validity and reliability results from experts received the feasibility of e-booklet with valid and highly reliable categories. The e-booklet also obtained excellent and interesting responses and readability from students.

References

Adha, N., Karma, I. N., & Husniati, H. (2021). Identifikasi Kesulitan Guru dalam Penyusunan Rencana Pelaksanaan Pembelajaran (RPP) Kurikulum 2013 di Sekolah Dasar Gugus 1 Kediri. *Renjana Pendidikan Dasar, 1(3)*, 218-229. https://doi.org/10.32672/jp2v.v1i1.2050

Aritonang, R., Rangkuti, I. N., & Dhana, V. P. (2022). Developing E-Booklet Based on Hair Trimming Video for Blended Learning. *Proceedings of the 6th Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2021), 591*, 732–735. https://doi.org/10.2991/assehr.k.211110.171

Ariyanti, W., Hardiansyah, H., & Mahrudin, M.

(2022). Pengembangan Bahan Ajar Berbentuk E-Booklet Ikan Familia Bagridae di Sungai Barito Desa Bantuil Kabupaten Barito Kuala pada Konsep Animalia. *JUPENJI: Jurnal Pendidikan Jompa Indonesia*, *1*(3), 61–77. https://doi.org/10.57218/jupenji.Vol1.Iss3.373

Asnawati, A., Sutrisno, S., & Imaningtyas, I. (2021). Pengembangan E-Sudent Worksheets (E-SW) Berbasis Literasi Sains dalam Pembelajaran IPA Muatan Gaya untuk Siswa Kelas IV Sekolah Dasar. *Efektor*, *8*(2), 98–109. https://doi.org/10.29407/e.v8i2.16207

Astuti, Y., Sutrio, S., & Verawati, N. N. S. P. (2021). Pengembangan Perangkat Pembelajaran Cooperative Tipe Group Investigation Untuk Meningkatkan Motivasi Berprestasi dan Kemampuan Berpikir Kritis Fisika Peserta Didik. *ORBITA: Jurnal Kajian, Inovasi Dan Aplikasi Pendidikan Fisika*, *7*(1), 65–71. https://doi.org/10.31764/orbita.v7i1.3855

Ati, A. P., Dja'far, H. I., Mubasyira, M., Wulansari, L., Sandiar, L., & Widiyarto, S. (2022). Penyuluhan Penggunaan Gawai untuk Mencegah Gangguan Belajar pada Siswa. *Jurnal Pengabdian Untuk Mu NegeRI*, *6*(1), 90–95. https://doi.org/10.37859/jpumri.v6i1.3543

Cahyadi, R. A. H. (2019). Pengembangan Bahan Ajar Berbasis ADDIE Model. *Halaqa: Islamic Education Journal*, *3*(1), 35–43. https://doi.org/10.21070/halaqa.v3i1.2124

Darmuki, A., Hariyadi, A., & Hidayati, N. A. (2020). Peningkatan Minat dan Hasil Belajar Keterampilan Berbicara Menggunakan Metode Mind Map pada Mahasiswa Kelas IA PBSI IKIP PGRI Bojonegoro Tahun Akademik 2019/2020. *KREDO : Jurnal Ilmiah Bahasa Dan Sastra*, *3*(2), 263–276. https://doi.org/10.24176/kredo.v3i2.4687

Delfita, R., Haviz, M., Nurhasnah, N., & Ulva, R. K. (2018). Pengembangan Modul Sistem Pencernaan Makanan Berbasis Literasi Sains Kelas VIII MTsN Padang Japang. *Natural Science Journal*, *4*(1), 480–491.

Dewi, A. C., Adi, E. P., & Abidin, Z. (2021). Pengembangan Infografis melalui Instagram sebagai Penguatan Pemahaman Pokok Bahasan Sistem Pencernaan Manusia. *JKTP: Jurnal Kajian Teknologi Pendidikan*, *4*(2), 216–224. https://doi.org/10.17977/um038v4i22021p216

Fuadi, H., Robbia, A. Z., Jamaluddin, J., & Jufri, A. W. (2020). Analisis Faktor Penyebab Rendahnya Kemampuan Literasi Sains Peserta Didik. *Jurnal Ilmiah Profesi Pendidikan*, *5*(2), 108–116. https://doi.org/10.29303/jipp.v5i2.122

Hanifah, H., Afrikani, T., & Yani, I. (2020). Pengembangan Media Ajar E-Booklet Materi Plantae untuk Meningkatkan Hasil Belajar Biologi Siswa. *Journal Of Biology Education Research (JBER)*, *1*(1), 10–16. https://doi.org/10.55215/jber.v1i1.2631

Hapsari, G. P. P., & Zulherman, Z. (2021). Pengembangan Media Video Animasi Berbasis Aplikasi Canva untuk Meningkatkan Motivasi dan Prestasi Belajar Siswa. *Jurnal Basicedu*, *5*(4), 2384–2394. https://doi.org/10.31004/basicedu.v5i4.1237

Hermansyah, H. (2020). Analisis Teori Behavioristik (Edward Thordinke) dan Implementasinya dalam Pembelajaran SD/MI. *Modeling: Jurnal Program Studi PGMI*, *7*(1), 15–25.

Irman, S., & Waskito, W. (2020). Validasi Modul Berbasis Project Based Learning pada Mata Pelajaran Simulasi dan Komunikasi Digital. *Jurnal Ilmiah Pendidikan dan Pembelajaran*, *4*(2), 260–269.

Mardiah, S., Widyastuti, R., & Rinaldi, A. (2018). Pengembangan Modul Pembelajaran Matematika Berbasis Etnomatematika Menggunakan Metode Inkuiri. *Desimal: Jurnal Matematika*, *1*(2), 119–126. https://doi.org/10.24042/djm.v1i2.2228

Muharni, S., Toha, F., Aryani, F., & Husnawati, H. (2022). Pengaruh Media Edukasi E-Booklet terhadap Tingkat Perilaku Tenaga Teknis Kefarmasian pada Penggalian Informasi Swamedikasi Common Cold. *Jurnal Penelitian Farmasi Indonesia*, *11*(1), 7–14. https://doi.org/10.51887/jpfi.v11i1.1538

Narut, Y. F., & Supradi, K. (2019). Literasi Sains Peserta Didik dalam Pembelajaran IPA di Indonesia. *Jurnal Inovasi Pendidikan Dasar*, *3*(1), 61–69.

Panggabean, N. H., Danis, A., & Nadriyah, N. (2020). Pengembangan Bahan Ajar Berbasis Mind Mapping pada Pembelajaran IPA Tema Lingkungan Sahabat Kita. *Jurnal Tunas Bangsa*, *7*(2), 204–218. https://doi.org/10.46244/tunasbangsa.v7i2.1177

Purba, Y. A., & Harahap, A. (2022). Pemanfaatan Aplikasi Canva sebagai Media Pembelajaran Matematika di SMPN 1 NA IX-X Aek Kota Batu. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *6*(2), 1325–1334. https://doi.org/10.31004/cendekia.v6i2.1335

Riska, J., Syafii, W., & Mahadi, I. (2023). Development of Prezi-Based Electronic Mind Map Learning Media on High School Animalia Biology Material. *Journal of Educational Sciences*, *7*(2), 341–349. https://doi.org/10.31258/jes.7.2.p.341-349

Sarip, M., Amintarti, S., & Utami, N. H. (2022). Validitas dan Keterbacaan Media Ajar E-Booklet untuk Siswa SMA / MA Materi Keanekaragaman Hayati. *JUPEIS: Jurnal Pendidikan Dan Ilmu Sosial*, *1*(1), 43–59. https://doi.org/10.57218/jupeis.Vol1.Iss1.30

Sholeh, M., & Basuki, U. J. (2019). Pengembangan Bahan Ajar Berbasis Teknologi Informasi pada Guru SD Muhammdiyah Pandes Pleret Bantul. *Dharma Bakti*, *2*(2), 166–176.

Sriwahyuni, I., Risdianto, E., & Johan, H. (2019). Pengembangan Bahan Ajar Elektronik Menggunakan Flip PDF Professional pada Materi Alat-Alat Optik di SMA. *Jurnal Kumparan Fisika*, *2*(3), 145–152. https://doi.org/10.33369/jkf.2.3.145-152

Sugianto, S. D., Ahied, M., Hadi, W. P., & Wulandari, A. Y. R. (2018). Pengembangan Modul IPA Berbasis Proyek Terintegrasi STEM pada Materi Tekanan. *Natural Science Education Research*, *1*(1), 28–39. https://doi.org/10.21107/nser.v1i1.4171

Sujiani, S., Malahayati, E. N., & Anggraini, D. P. (2022). Efektivitas Modul Berbasis Mind Mapping untuk Meningkatkan Hasil Belajar Muatan Pelajaran IPA di MTS. *Edutainment : Jurnal Ilmu Pendidikan Dan Kependidikan*, *10*(1), 32–36. https://doi.org/10.35438/e.v10i1.638

Sulistyosari, Y. (2018). Kreativitas Guru dalam Mengembangkan Bahan Ajar IPS pada SMP/MTs Se-Kecamatan Ngadirejo Kabupaten Temanggung. *Harmony*, *3*(2), 178–189.

Wahab, M. N. N. D., Istyadji, M., & Febriyani, P. R. (2021). Pengembangan Modul Pembelajaran IPA SMP Berbasis Literasi Sains pada Materi Sistem Tata Surya. *Jurnal Ilmiah Pendidikan Fisika*, *5*(3), 278–291. https://doi.org/10.20527/jipf.v5i3.3675

Wardhani, S. W. (2018). Pengembangan Media Scrapbook pada Materi Pengelompokan pada Hewan untuk Materi Kelas III Sekolah Dasar. *Jurnal Sekolah*, 2(2), 124–130. https://doi.org/10.24114/js.v2i2.9934

Waseso, H. P. (2018). Kurikulum 2013 dalam Prespektif Teori Pembelajaran Konstruktivisme. *Ta'lim: Jurnal Studi Pendidikan Islam*, *1*(1), 59–72. https://doi.org/10.52166/talim.v1i1.632

How to cite this article:

Paduwinata, P., Wulandari, A. Y. R., Tamam, B., Wahyuni, E. A., & Hartiningsih, T. (2024). Development of Science Literacy-Based E-Booklet Accompanied by Mind Mapping on Human Digestive System Material. *Journal of Education and Learning Research*, *2(1)*, 19-27.