Validity of Non-Text Book of Microplastics in Consumed Fish at Medan Traditional Markets

Nadya Khairun Nisa[1], Syarifuddin[2], Herbert Sipahutar[3]

{nadya04nisa@gmail.com[1], syarif_syarifuddin@yahoo.com[2], herbert_sipahutar@yahoo.com[3]}

Biology Education Departement, Post Graduated, Universitas Negeri Medan, Medan 20221[1]

Biology Education Departement, Post Graduated, Universitas Negeri Medan, Medan 20221[2]

Biology Education Departement, Post Graduated, Universitas Negeri Medan, Medan 20221[3]

Abstract. The validation of the developed non-text book was analyzed based on aspects of the feasibility of the media and material. Media aspect validation was carried out by two media expert lecturers. Material aspects are validated by one lecturer and one learning expert. The results showed that the content feasibility of the developed non-text books as a whole was included in the very good category with an average proportion of 89,5. The feasibility of the design and learning design for the presentation of non-textbook as a whole is in very good category with an average proportion of 91 and 88,50 so that it is acceptable and feasible to use in the learning process. The results of biology student's response to the non-textbook got a percentage of 87,24 in the very good category which means that the book developed is valid.

Keywords: Validity, Non-text book, microplastics, consumed fish

1 Introduction

One of the factors in supporting activities, especially in learning biology, is the existence of open materials. Teaching materials act as basic references that can direct learning activities [1]. The existence of open material makes it easy for lecturers and students to understand the concept as a whole.

Teaching materials are materials used to assist lecturers, lecturers and instructors in carrying out teaching and learning activities in the classroom and in the laboratory[2]. The material in question can be in the form of written material or unwritten material. Textbooks are part of the teaching materials designed so that students master the competencies they will achieve. The large number of textbooks in the increasingly advanced world of education provides many choices for educational institutions, lecturers and students to get the textbooks they want. Appropriate textbooks that are easy to understand and contain material that is in accordance with the applicable curriculum will make it easier to achieve learning goals. Not all open books are equally good, there should be several different books on the same field of study. Material that is less clear in one book may be easier to understand in another book. The availability of several types of open books can help students master the material.

Books are teaching materials that are widely used in schools. In connection with the Regulation of the Minister of Education and Culture Number 8 of 2016 concerning books used by

AISTEEL 2023, September 19, Medan, Indonesia

DOI 10.4108/eai.19-9-2023.2340553

educational units, it states that books used by educational units consist of textbooks and non-textbooks. Non-textbooks are different from textbooks. If examined with a lexical meaning, textbooks are books that are used to study or explore a subject of knowledge and science, as well as technology, so that it contains a presentation of principles about the subject, including clerical works related to the subject concerned.

Non-text books can be useful to complement textbooks. This is as stated in the Regulation of the Minister of Education Number 2 of 2008 article 6 (2) which states that "besides textbooks, educators can use educator manuals, enrichment books, and reference books in the learning process". This description is reinforced by paragraph (3) which states "To increase students' knowledge and insight, educators can encourage students to read enrichment books and reference books"[3].

In general, microplastics themselves are defined as plastic with a asize of less than 5 mm[4]. There are two types of microplastics, namely primary microplastics which are produced directly for certain products used by humans (such as soap, detergents, cosmetics and clothing), and secondary microplastics which originate from the decomposition of plastic waste in the oceans. These two types of microplastics can persist in the environment for a long time [5]. The very small size allows microplastic particles to mix with the plankton community which is food for several types of fish that are on the surface of the sea, this causes fish to be very vulnerable to ingesting microplastics.

One of the most well-known maritime countries with great potential in the fisheries sector is Indonesia. Therefore, Indonesian marine areas are vulnerable to microplastic contamination, this is evidenced by the results of Rochman's research which found 28% of samples of several types of fish at TPI Paotere, Makassar contained pieces of plastic that were micron in size ranging > 500 micrometers and an average of the average size is 3.5 mm. Consumption fish in several countries have also been contaminated by microplastics, as has been identified in the digestive tract of epipelagic comsumption fish in the North Pacific Ocean, finding an average of 2.1 items in each fish's body[6].In Euthynnus affinis digestive tract also found the microplasctics such as fragment, ganule, film and fiber with total aboundance of microplastic was 52.7 particles/ind, with 10.5 ±7.2 particles/ind of average that marketed at Pulau Baai Port, Bengkulu City[7]. Not only in fish, microplastic content was also found in blood clams (Anadara granosa) which are in the waters of Tanjung Tiram, Ambon Bay. Several types of consumption fish found in traditional markets in the city of Medan were the samples for this research. This location was chosen because it is an area with a coastal location that has a lot of plastic waste. The condition of beaches near residential areas is assumed to allow the presence of microplastics as suspended particles in the surrounding marine organisms.

2 Method

The type of research used is develpment research using 4 D development model developed by Thiagarajan[8].The subjects of this research are biology students class of 2022 of Universitas Negeri Medan.The non-text book validation that was developed was analyzed based on the aspects of design feasibility and material feasibility. Validation of design aspects is carried out by a design expert lecturer. Material aspects are validated by one lecturer and one expert in the field of learning (learning practitioners). The instrument used to collect data is a non-text book validation sheet based on a Likert Scale.

3 Research Results And Discussion

3.1 Material Feasibility by Material Experts

The validation of the non-text book of microplastics in consumed fish at Medan traditional market based on research is intended to find out the opinion of material experts about the components of the non-text book based on research and material substance (content feasibility, presentation feasibility and language feasibility). Material expert validation of the development of the non-text book based on this research was carried out by a biology lecturer at Medan State University. The results of the assessment sheet from the questionnaire by material experts are presented in table 1 below.

Table 1. Content feasibility assessment from material experts.

Components	Number of validator scores	Feasibility (%)	Criteria
Content feasibility	4.55	87	Very good
Language feasibility	4.50	92	Very good
Total	9.05	89,5	Very good

From the results of material expert validation regarding non-text books on the microplastics existence in consumed fish at Medan traditional market based on research, it can be concluded that the book material is in the "Very Good" criteria with an average percentage of 89.5. The validator provides several inputs which will be corrected by the researcher, such as providing instructions for using the book, including research results in the book, sentences should not be ambiguous and correct English writing procedures and others. The complete results of the material expert assessment of the developed non-text book. Following up on input from material experts, researchers have made improvements as in Table 2.

Table 2. Revision material of the non-text book content by material experts.

Before Revision	After Revision
Instruction for using the book need to be added	Instruction for using the book have added
The microplastics terms are not visible yet	It is included in the glossary section
Sentences should not be ambiguous. For example “if the size of the microplastic is too small it will cause…”	“If the size of microplastic is small, it will be easier to digest...”
It is necessary needed the procedures of writing English in non-text book	All English writing has been written in italics
All sources not referred to are only in the bibliography	It has been referred to according to the source obtained
Adjust the glossary layout to give more attention and emphasis to terms	The writing of the glossary has been italicized

3.2 Feasibility of Design by Design Experts

Validation of design product is intended to find out the opinion of design experts regarding to the design of non-text book. The validation of design experts for the development of non-

textbook on the microplastics existence in consumed fish at Medan traditional market based on research was carried out by a Biology lecturer at Medan State University. The results of the assessment by the design expert questionnaire are presented below.

Table 3. Assessment from layout design experts.

Components	Number of validator scores	Feasibility (%)	Criteria
Cover design	4.50	90	Very good
Book cover typography	4.50	89	Very good
Design content	4.50	90	Very good
Content illustration	4.55	95	Very good
Average	4.53	91	Very good

From the results of the design expert's validation of research-based non-text books, it can be concluded that the non-text book material is in the "Very Good" criteria. Valid is said if the results obtained are between 90-100. The validation results for the book design show a score of 91. In this section, the validator provides several inputs that will be corrected by the researcher, such as adding an attractive back cover to the book, the background behind the title is not bright enough, the margins of the book are consistent, the spacing of the book contents, the type of font should be different and writing errors. Following up on input from layout design experts, researchers have made the following improvements:

Table 4. Revision of non-text book layout by design experts.

Before Revision	After Revision
The cover color is less attractive and so is the design	The back cover of the book has been added
The background behind the title does not contrast well with the title text, causing the title to be less clear.	The background behind the title and title text have been corrected
The table of contents is still not neat	The table of contents has been tidied up.
The placement of each image in the book is not uniform and many are still blurry.	It has been corrected according to the suggestions
The consistency of margin spacing between paragraphs needs to be considered again	The consistency of margins and spacing between paragraphs has been improved
The font at the beginning of each chapter title doesn't match the font for the contents of the chapter	he font at the start of each chapter title has been fixed
The spacing of the books contents to the footer is too close	The spacing of the contents of the book with the footer is not close
The footer font type and book content should be different.	The footer font type and book content should be different
Please pay attention to typos	writing errors (typos) have been corrected

3.3 Non-Text Book Assessment Results by Lecturers

Assessment of non-textbook on the existence of microplastics in consumed fish at Medan traditional market based on research by lecturers was carried out to obtain information that will be used to improve the quality of teaching materials that will be developed. From the results of lecturer's validation, it can be concluded that the non-text book of is in the "very good" criteria with an average of 88.50.

3.4. Results of Non-Text Book Assessment by Students (Individual Trial)

Evaluation of the non-text book by biology students was carried out to obtain information that will be used to improve the quality of teaching materials that will be developed. The student assessment results can be seen in the table below:

Table 5. Individual assessment results by students (individual trial)

Individual Assessment	**Students (3 Students)**		
	1	**2**	**3**
Total score	147	149	148
% Evaluation	88,50%	87,05%	87,05%
Average of % evaluation		87,24%	
Criteria		Very good	

From the results of individual trials it can be concluded that the non-textbook is in the "Very Good" criteria with an average percentage of 87.24%.

3.5 Results of Non-Text Book Assessment by Students (Small Group Trial)

Evaluation of non-textbook on the microplastics in consumed fish at Medan traditional market based on research by biology students was carried out to obtain information that will be used to improve the quality of teaching materials that will be developed. The student assessment results can be seen in the table below:

Table 6. Results of small group trials by biology students

Individual Assessment	**Students (9 Students)**								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Total score	150	155	157	158	150	162	150	151	149
% Evaluation	88,23%	91,17%	92,94%	88,23 %	93,52 %	88,23 %	89,41 %	87,05 %	92,35 %
Average of % evaluation	90.12%								
Criteria	Very good								

From the results of small group trials, it can be concluded that the non-text book is in the "very good" criteria with an average percentage of 90.12%.

3.6. Results of Non-Text Book Assessment by Students (Limited Group Trial)

Evaluation of the non-text book by biology students was carried out to obtain information that will be used to improve the quality of teaching materials that will be developed. The student assessment results can be seen in the table below:

Table 5. Individual assessment results by students (individual trial)

Limited Group Assessment	Students (24 students)
Total score	3849
Average of % evaluation	94.14%
Criteria	Very good

From the results of limited group trials, it can be concluded that the non-text book is in the ”very good“ criteria with an average percentage of 94.14%.

4 Conclusion

Based on the research, it can be concluded that the feasibility contents of the development non-text book as a whole is included in the very good category with a percentage average of 89.5. The feasibility of the design and learning design for the presentation of the non-text book that was developed as a whole is in the very good category with an average percentage of 91 and 88.50 so it is acceptable and suitable for use in a learning process. The lecturer’s assessment for the non-text book that was developed as a whole is in the very good category with an average percentage of 88.50. Student’s assessment of the non-text book that was developed as a whole is in the very good category with an average percentage of 87.24.

References

[1] Indriana, D: Ragam Alat Bantu Media Pengajaran. PT Diva Press, Jakarta (2011)

[2] Prastowo, A: Panduan Kreatif Membuat Bahan Ajar Inovatif. Diva Press, Yogyakarta (2014)

[3] Departemen Pendidikan Nasional: Panduan Pengembangan Bahan Ajar. Direktorat Pembinaan Menengah Atas, Jakarta

[4] Dris, R,Imhof, H., Sanchez, W., Gasperi, J., Galgani, F., Tassin, B., Laforsach, C.: Beyond the eccean: contamination of freshwater ecosystems with (micro)plastic particles.Environ. Chem.Vol.12, pp. 539 (2015)

[5] Driedger,A: Plastic debris in the Laurentian Great Lakes: A review. Journal of Great Lakes Research. International Association for Great Lakes Research. Vol.1, pp.9-19 (2015)

[6] Boerger, C., Lattin, G., Moore, S., More, C: Plastic ingestion by planktivorous fishes in the North Pacific Central Gyre. Vol. 60 pp.2275-2278. Marine Pollution Bulletin (2010).

[7] Purnama,D: Analisis Mikroplastik pada Saluran Pencernaan Ikan Tongkol (*Euthynnus affinis*) Hasil Tangkapan Nelayan di Pelabuhan Perikanan Pulau Baai Kota Bengkulu. Jurnal Enggano. Vol.6 pp.110-124 (2021)

[8] Trianito: Model Pembelajaran Terpadu, Konsep, Strategi dan Implementasinya dalam KTSP. Bumi Aksara, Jakarta (2010)