PROCEEDING

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Bengkulu International Conference on Science and Education (BICSE - 2017)

"Breaching international boundaries to share scientific research and advance education"

Rectorate Building 3rd Floor, University of Bengkulu
December 14 – 15, 2017

Invited Speakers:

Dr. Corey Johnson
University of North Carolina–Greensboro, USA

Dr. Jay Lennartson
University of North Carolina–Greensboro, USA

Dr. Ian Singleton
PanEco Foundation, Switzerland

Organizer:
Fakultas Keguruan dan Ilmu Pendidikan
Universitas Bengkulu

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Chief editor: M. Lutfi Firdaus, Ph.D.

FKIP UNIB Press, 2018

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Dr. Agus Sundaryono
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PREFACE FROM ORGANIZING COMMITTEE

The Bengkulu International Conference on Science and Education (BICSE-2017) was held from 14 – 15 December 2017, in Bengkulu, Indonesia. The conference is organized by Faculty of Teacher Training and Education, University of Bengkulu. The conference was hosted in the rectorate building of University of Bengkulu and new hall building of the Faculty of Teacher Training and Education located in the Bengkulu city center.

This conference was organized by Faculty of Teacher Training and Education, University of Bengkulu, which was attended by more than 100 registered presenters and participants. Invited Speakers include Dr. Jay Lennartson, Dr. Corey Johnson, and Dr. Ian Singleton. The theme of the conference is "Breaching international boundaries to share scientific research and advance education." The range of topics covered by BICSE 2017 are experimental, theoretical and empirical papers includes, but not limited to (1) Scientific research, (2) Science, physics, chemistry and biology, (3) Teaching, learning, media, and assessment in education, (4) Teacher education, (5) Teaching technology, (6) Research on education, science, and in between, and (7) Advance education.

Finally, we thank all the participants of BICSE 2017, everybody who helped in the organization, all sponsors, the PEER-project supported by USAID, and we are looking forward to meeting you again at BICSE 2019.

Bengkulu, 28 February 2018
BICSE Organizer,

M. Lutfi Firdaus, Ph.D
Chairman

PREFACE FROM PEER PROJECT

Principal Investigator (PI) of Sumatran Turtles Conservation Project

There is a clear distinction between scientists and science teachers in Indonesian universities, with scientists focusing on pure biology (science) and science teachers focusing on learning biology (pedagogy). Some educational institutions in Indonesia still emphasize this *dichotomy* between content and learning, which has been noted as *a classical problem* in science education. The difference between a scientist identity and a science teacher identity is only where to place the emphasis. I believe that both science and learning research capacity to show that these two identities can co-exist in a single individual and that can be very beneficial. In the meantime I also witnessed the facts that Science education at the K-12 levels in Bengkulu does not focus on biodiversity. Fieldwork is rarely included as an instructional technique at any educational level, and there is little focus on local conservation issues. Bengkulu University (UNIB) recently started a graduate program for teachers with the theme of "Natural Conservation Education for A Better Life". In conjunction with this graduate program, UNIB has also started a pioneering conservation effort, "UNIB Campus, A Safe Home for Turtles," with educational components at the K-12 level and at the university as part of the Science Teacher Education curriculum track. On the basis of the description I feel that the development of science teachers through the experience of science and learning research is one option for the improvement of science education in locations similar to Bengkulu.

Implementation of *science and learning research* in science teacher education was not easy. It requires a long discussion and openness of the existing dichotomy paradigm. Students of biology education, for example, usually do not easily answer with a short sentence when asked: "What is the difference between biology and pure biology?" Some of them answered; "We study biology according to the curriculum demands where we will teach". I communicated with some science education experts, among others, Dr. Catherine Matthews. She is a science educator at the University of North Carolina Greensboro (UNCG), and is also Principal Investigator (PI) on the National Science Foundation (NSF) -funded project; "Herpetology Education in Rural Places and Spaces". Matthews and I visited each other, wrote some manuscripts, and submitted a number of research proposals including titled; "Developing science and learning research capacity of Bengkulu University in ex situ conservation of Sumatran freshwater and terrestrial turtles". The proposal is funded by USAID through the Partnerships for enhanced engagement in research (PEER) project for the period of December 2015 - November 2018.

The main goal of this PEER project is to develop both *science and learning research* capacity through cooperation between UNCG and UNIB using the field of herpetology as a venue to improve conservation education and, indeed, conservation itself. Furthermore the cooperation is designed to achieve the following goals; (1) identify some safe habitats for five species of turtles, (2) increase science and learning research capacity through the thesis research of nine graduate students, (3) develop teaching modules, (4) develop both indoor and outdoor learning resources, and (5) establish a new teacher training center in herpetology and environmental education on the green campus of UNIB. This project will

support the spirit of the program "UNIB Campus, A Safe Home for Turtles," which is a novelty for Indonesia. The existence of the turtles on the UNIB campus will be a learning resource for conservation education for the young people in Bengkulu. This model of conservation efforts through educational approaches is designed to be completed over three years, as an attempt to improve the competence of biology teachers in Bengkulu and other provinces of Indonesia.

As the PI of Sumatran Turtles Conservation Project, I am very excited with Bengkulu International Competence on Science and Education 2017 (BICSE 2017). BICSE 2017 is an excellent forum for exchanging experiences on science and learning research. Hopefully in the next, BICSE becomes an annual regular agenda. Welcome to Bengkulu. Congratulations to do your best for science education.

Bengkulu, 28 February 2018

Dr. Aceng Ruyani, MS
Principal Investigator

GENERAL TIME SCHEDULE

Venue: University of Bengkulu (main campuss)
Jl. WR. Supratman, Kandang Limun, Bengkulu 38371
Plenary session: Rectorate of University of Bengkulu, 3rd floor – main meeting room
Parallel and poster session: Graduate School of Science Education office hall, 3rd floor

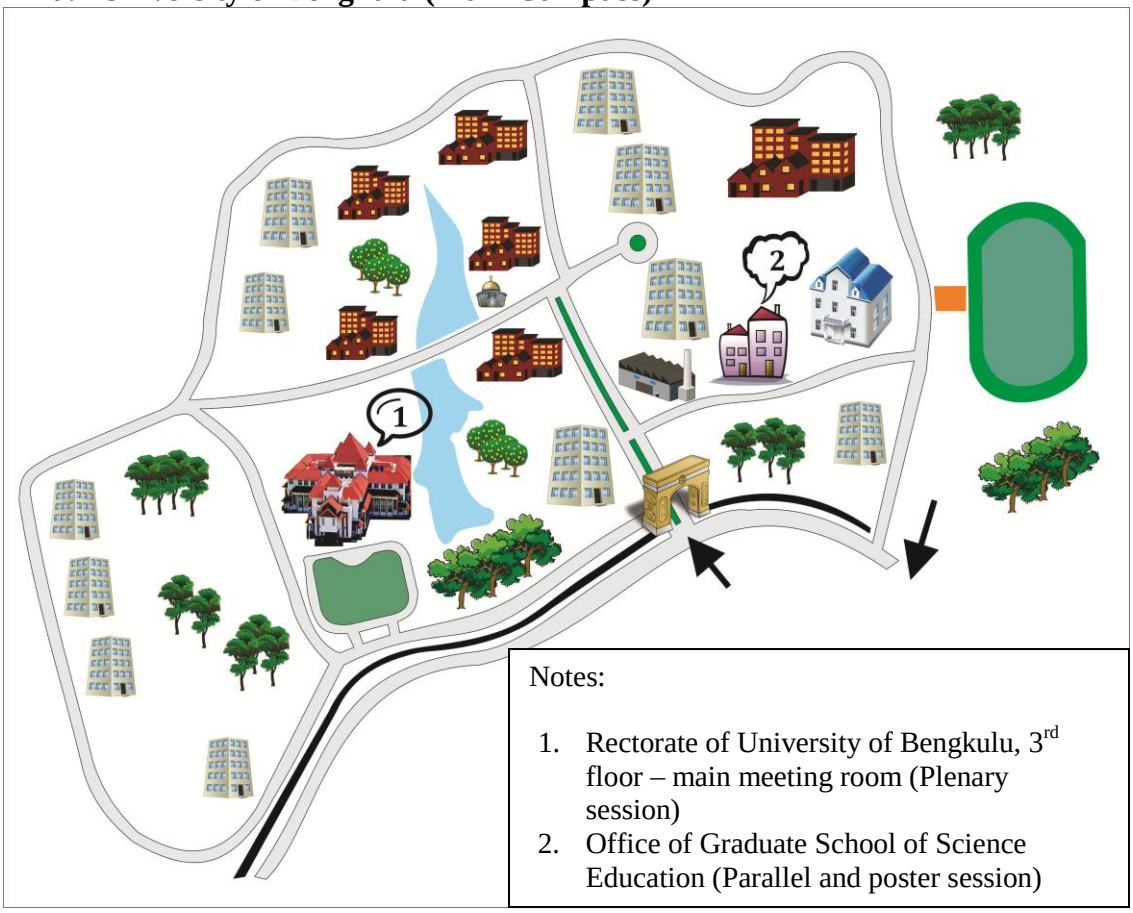
Day 1: December 14, 2017

08:00 – 08:45	Registration
08:45 – 09:45	**Opening ceremony**
	Traditional dance
	Singing "Indonesia Raya"
	Prayer readings
	Speech 1: BICSE chairman
	Speech 2: Dean of Faculty of Teacher Training and Education
	Speech 3: Rector of University of Bengkulu
	Photo session
	Chorus "Heal the World"
09:45 – 12:00	**Plenary session**
	Dr. Corey M. Johnson
	Dr. Jay Lennartson
	Dr. Ian Singleton
12:00 – 13:00	Lunch break
13:15 – 13:45	Poster session
13:45 – 16:00	Parallel session (5 rooms, each presentation 12 minutes)
16:00 – 16:30	Closing
	Best oral and poster presenter announcement

Day 2: December 15, 2017
Bengkulu City Tour
Location: Fort Marlborough, Soekarno's seclusion house, Anggut souvenir market, Long beach, etc.
Please register first at registration desk on December 14, 2017.

FLOOR PLAN

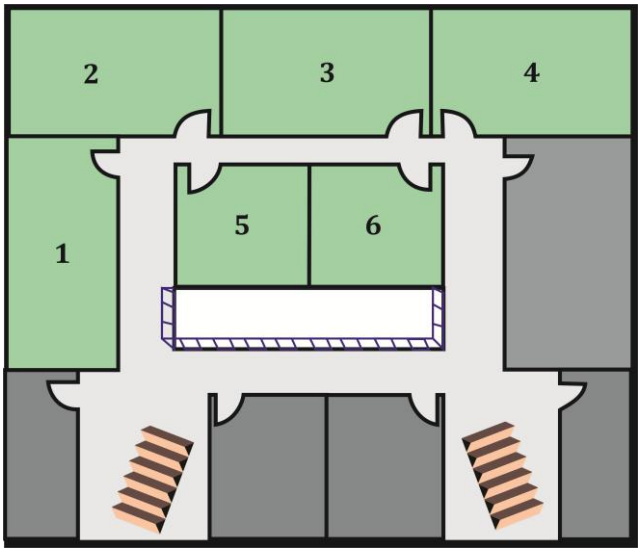
a. University of Bengkulu (Main Campuss)



Notes:

1. Rectorate of University of Bengkulu, 3rd floor – main meeting room (Plenary session)
2. Office of Graduate School of Science Education (Parallel and poster session)

b. Floor Plan for Parallel and Poster Session



Notes:
Room name: Office of Graduate School of Science Education

Place: 3rd floor
Poster Session : Room 1

Room Number (Parallel Session):

1. Room Group 1
2. Room Group 2
3. Room Group 3
4. Room Group 4
5. Room Group 5
6. Room Group 6

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KEYNOTE SPEAKERS

Dr. Corey M. Johnson

Department of Geography, The University of North Carolina at Greensboro, 237 Graham Building 1009 Spring Garden Street, Greensboro, NC 27412, USA.

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Examining environment and development tradeoffs through the Resource Nexus (RN): The case of urban governance

ABSTRACT

With the publication of the United Nations' *Sustainable Development Goals* and the Paris Agreement on climate, and a host of other multilateral agreements, governing environmental change is front and center in global governance. Now attention turns to the challenges of implementation, measurement, and metrics, especially in the arena of natural resource use. The resource nexus (RN) approach has been offered as one of escaping the trap of individual resource categories by critically engaging the interlinkages between two or more natural resources used as inputs into socio-economic systems. This presentation draws on work with a collaborative network of RN scholars, first providing a brief overview of the concept and its relationship to environmental change, sustainable development, and security. It then looks at the specific case of RN issues in urban spaces, where an ever increasing share of the world's population lives. Cases from South and East Asia are used to illustrate the potential—and some of the limitations—of RN approaches to help us understand and better address the environmental consequences of resource extraction and consumption in cities.

Dr. G. Jay Lennartson

Department of Geography, The University of North Carolina at Greensboro, 237 Graham Building 1009 Spring Garden Street, Greensboro, NC 27412, USA.

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The Seven Pillars of Environmental Destructiveness

ABSTRACT

America is the global leader in per capita emissions of greenhouse gas emissions as a result of environmental behaviors and attitudes that are antithetical to environmental sustainability. My talk will highlight the seven key American behaviors that have proven so detrimental to the global environment and will explore ways in which such behaviors and attitudes can be changed so that developed and developing countries can function in a more environmentally sustainable manner.

Dr. Ian Singleton

Director
Sumatran Orangutan Conservation Programme
PanEco Foundation, Switzerland

Saving Sumatra's Orangutans

ABSTRACT

Orangutans are Great Apes, along with Chimpanzees, Bonobos and Gorillas. 2 species of orangutan were recognized, the Sumatran orangutan (Pongo abelii), and the Bornean orangutan (Pongo pygmaeus), but a recent scientific publication announced the existence of a third, new species – the Tapanuli orangutan (Pongo tapanulienses) in the Tapanuli region of North Sumatra. Most orangutans in Sumatra reside in the Leuser Ecosystem, straddling the border of Aceh and North Sumatra provinces. SOCP surveys suggest there are only around 13,500 Sumatran orangutans remaining, and less than 800 Tapanuli orangutans. Threats to both species include habitat conversion for palm oil, the construction of new roads and the development of new so-called renewable energy projects. The Tapanuli orangutan populations is also already fragmented in at least 3 smaller sub populations and corridors to reconnect these fragments are urgently needed. The paper will also describe some legal successes against palm oil companies illegally burning orangutan habitat in the Tripa swamps region of the Leuser Ecosystem and how groups of dedicated individuals can make a difference in conservation in Indonesia. The paper will also argue that the economic justification for continued destruction of Sumatra's remaining forests habitats is weak, at best.

39. The Making of Organic Chemistry I Digital Books by Using the Sigil Epub Editor Application

Dewi Handayani[1*]
[1]Department of Chemistry Education, University of Bengkulu
*Email: zidan1712@yahoo.com

ABSTRACT

The purpose of this research is to improve the quality of chemistry learning with digital book media with the help of Sigil ePub editor application. This research includes the type of Development Research with the steps: Conducting preliminary research or preliminary survey, undertaking planning that needs to be developed and small scale expert test planning on the developed model design, initial product development in the form of preparation of learning materials, guidance, and evaluation tools. Furthermore, early-stage field trials with small-scale targets and revised primary test products. Future research (next year) will be field trials with larger subjects, revise operational products, conduct field tests that can be done through observation and questionnaires, revise the final product, disseminate product results. From the results of research, obtained the results of digital books Organic chemistry 1 for students of Chemistry Education Studies Program FKIP UNIB has been created and validated by a team of experts. The created digital book is judged valid by material validator and media validator by providing 85% success rate (very good criteria) and 80.5% (good criteria). Students as users state that the media is very well used to learn independently. This is stated in the percentage of student responses to digital book media is 85.7%. Testing by students is only new in limited classes. The resulting digital book needs further revisions to be able to use into large classes.

Keywords: Digital Book, Organic Chemistry 1, ePub Editor Sigil.

1. Introduction

Learning in the 21st century demands a curriculum that focuses on mastery of teaching materials, development of English proficiency, possesses skill / skills in the laboratory, good attitude, and mastery of ICT media. Particularly in the use of ICT media, in Higher Education the teaching aids or media used has not given students the opportunity to study individually outside campus learning. This reduces students' interest and motivation to learn independently.

With the development of science technology and communication resulted in significant changes to the model of learning in Higher Education (University). Among them are e-learning based learning, e-book, video-based and others. The devices currently used are also very supportive, such as computer lab facilities, BATIK (Technology, Information and Communications Board at Bengkulu University), WIFI networking facilities, laptops, and Smartphones which on average have been owned by everyone (lecturers and students). The development of technology and communications introduced models and patterns. The facility is required to be able to access and run the various learning media created. Gadgets or hardware can be a tool that can be used by lecturers in learning on campus and facilitate students in learning outside school.

[1] defines the learning media as a physical and non physical tool that deliberately used as an intermediary between teachers and students in understanding learning materials to be more effective and efficient. Learning media used to facilitate students off of campus to learn the development of digital books or e-books. E-book or electronic book (or also digital book) is the evolution of the print books we used to read everyday [2]. A digital book is a publication composed of text, images, or sound and published in digital form that can be read on computers and other electronic devices. Digital books are usually an electronic version of a printed book, but not infrequently a book is only published in digital form without a printed version. The program that will be used is ePub (Elektronic Publication) Editor Sigil. Electronic publication (Epub) is one of the digital book formats agreed by International Digital Publishing Forum (IDPF) in October 2011. Epub replaces the Open eBook role as an open book format. Epub consists of multimedia files, html5, css, xhtml, xml packed in one file. (Southeast Asian Ministers of Educatioan Regional Organization Open Learning Center [3]. The advantages of ePub are:

1. It has been standardized, so it is expected to be read on various devices
2. Able to hold multimedia files in it (mp4, mp3, ogg, webm)
3. Reflowable content, Able to have a modified layout so that it can enter into space around other objects in the document. Whether writing, drawing or video can be arranged layout.

The ePub editor application Sigil is an open source ePub editor software. Some features of Sigil are as follows:

1. Free and Open Source with GPLv3 license
2. Multiplatform: can run on Windows, Linux and Mac
3. Multiple view: Book view, Code View and Preview
4. Can directly edit the look of epub in book view
5. Generator table of contents with support for multi-level heading
6. Sigil metadata editor already supports import video and audio files since version 0.7.0. In this book we will use Sigil version 0.7.2.

From the observations, the Chemistry Education Study Program especially in the course of Organic Chemistry 1 has not used digital books in support of Chemistry learning reference in Higher Education. While the University of Bengkulu already has facilities BATIK and WIFI to support the use of digital books. This course of Organic Chemistry describes the notions of organic chemistry, describes the structure of organic molecules, functional groups in organic chemistry and organic chemical stereos.

The fundamental problem in the application of digital books is that lecturers have not understood the importance of digital books in the era of information and communication technology, besides not yet skilled teachers make the digital book. Therefore, researchers with a team of experts try to develop learning with reference to digital book support through ePub application. In terms of ease of making it, making digital book ePub editor Sigil including the easy to work. We make it unnecessary internet network, just off line.

Given the ease of making and using as well as the great benefits of a digital book, researchers are trying to create a digital book for Organic Chemistry 1. The general aim of this research is to improve the quality of Chemistry learning. In addition to this, the development of digital books is also in order to follow the development of the digital world that information can be accessed and studied anywhere without having to bring the physical form of textbooks. The specific purpose of this research is to create a digital book in the course of Organic Chemistry 1 with the help of Sigil ePub editor application and see student response with the digital book.

2. Methods

This research includes research and development (R & D) which is research method used to produce certain product and test the effectiveness of the product [4].

This research was conducted in May 2017 until October 2017. The research place in GB 3 University of Bengkulu. According to [5] Sample is the partial or representative of the population under study. Meanwhile, according to [6] explained that the sample is a small group taken from the population environment and then observed or conducted research. The sample in this research is the third semester student of Chemistry Education Study Program of academic year 2016/2017. The sample selection was done randomly and then performed a limited trial of the class.

Research method of development in this research as according [7] consists of 3 main components, namely: (1) Development Model, (2) Procedure Development, and (3) Product Testing. The development research procedure includes the following steps:

1. Development model consists of:
   a. The depiction of the model structure to be developed
   b. Reasons for choosing the model to be developed
   c. Components related to the developed model
2. Development Research Procedures consist of:
   a. Conduct preliminary research or preliminary surveys aimed at digging deeper into the problems that occur in the field
   b. Planning by identifying and pouring out any skills, objectives, learning sequences that need to be developed, and expert test planning and small-scale testing of the design of the developed model
   c. Initial product development in the form of preparation of learning materials, guides, and evaluation tools
   d. initial field trials with small target scales
   e. Revise key input-based products and suggestions of preliminary results (In this study, the study was limited to initial field trials).
   f. Main field trials with larger subjects
   g. Revise operational products based on inputs and objectives of field test results
   h. Conducting field tests that can be done through observation and questionnaires
   i. Revise the final product
   j. Dissemination of product results
3. Models of test or products

   Consists of 3 stages:
   a. Expert test with the result of validation on inputs from the expert team of products to be developed
   b. The trial was limited in the experimental class with the test sample teaching the material with about 10 students and 2 observers further inputs for revised product improvements. (In this study, the study was limited to product trials only to a limited trial).
   c. Field test in 2 experimental classes as a whole with 30-35 students. In this field trial there must be peer observer.

2.1 Data Collection Technique

The data collected in the form of inputs are poured in the questionnaire and the result checklist observation instruments that are recorded in accordance with its components. The feasibility of developed media products includes the criteria of a good multimedia component [8].

For the view of developed products will be seen also as [9] stated the assessment of the software includes assessment of text, graphics, sound, music, video, and animation and learning activities in it.

2.2 Data Analysis

The data analyzed is a description containing the inputs from the research objectives and quantitative calculations in the form of the percentage of the feasibility of product testing using the percentage of answer choice formula. Data obtained from questionnaires are summed or grouped according to the instruments used. The formula used in descriptive analysis is as follows:

$$\% = n / N \times 100\%$$

information:

n = Number of values obtained.

N = Total of all ideal values (number of respondents x highest score). [4].

For the purposes of quantitative analysis the answers are scored for each statement as follows:

1. Not good
2. Good enough
3. Fine
4. Very good

So for the purposes of the analysis of percentage scores transferred into qualitative values are grouped into 4 categories. Category determination in percentage as follows:

a. % highest = (4/4) X 100% = 100%
b. % lowest = (1/4) X 100% = 25%
c. Strain in% = 100% - 25% = 75%
d. Interval% = 75% / 4 = 18.75%

Table 1. Descriptive Criteria Percentage digital book of Organic chemistry 1

Percentage Intervale	Criteria
81,25% - 100%	Very good
62,5% - 81,25%	Good
43,75% - 62,5%	Good Enough
25% - 43,75%	Not good

The digital book is declared valid or eligible to use if the percentage results show a range of scores between 62.5% - 81.25% (good) or 81.25% - 100% (very good).

3. Results And Discussion

Organic Chemistry I digital book with ePub editor application sigil already created and produced. The steps in making the digital book Organic Chemistry I with ePub application editor sigil of them are as follows:

a. Conduct preliminary research or preliminary surveys aimed at digging deeper into the problems that occur in the field
b. Planning by identifying and pouring out any skills, objectives, learning sequences that need to be developed, and expert test planning and small-scale testing of the design of the developed model
c. Initial product development in the form of preparation of learning materials, guides, and evaluation tools
d. initial field trials with small target scales
e. Revise key input-based products and suggestions of preliminary results (In this study, the study was limited to initial field trials).

In the implementation of research carried out with 3 main stages:

3.1 Study Preliminary Study

At this stage consists of 2 parts, among others, literature studies and field studies. Literature study is done by finding references and libraries related subjects chemistry organic 1. While field studies are conducting field observations by digging information, exploring problems and identifying problems. The problems that occur in the course of organic chemistry 1 of which is the student does not have media that can be used to study independently in studying this course. The use of media by new lecturers is limited to the use of power point in delivering the material. With the creation of digital books, can help lecturers in learning on campus and can be used self-study students anywhere and anytime.

3.2 Development Stage

At this stage consists of several parts of which are the drafting of the model design. Data obtained from the field survey and supported by the basics of theories from the results of literature study, the researchers then drafted the design of learning media model consisting of 3 stages, among others:

3.2.1 Preparation of draft materials, manuscripts, and digital books.

Digital book writing design is meant here is the media preparation framework used as a guide in the making of digital books which will be adjusted the content of the material and display of digital books in accordance with the needs of students. The writing of digital books understand and maintain the starter system begins by composing opaque digital books. The resulting digital book is expressed as blurred up to the completion of the validation and testing process. If the test results have been declared feasible, then the digital book can be implemented in real field. The drafting of the materials in this study refers to the syllabus of the course of organic chemistry 1. The material or manuscript of the digital reference book is drawn from several existing organic chemistry books with several developments and modifications made by the researcher. Some videos related to the material are also made by the researchers themselves.

3.2.2 Digital book making

The making of a digital book begins with collecting data. Data collection is done by summarizing the learning materials in the course of Organic Chemistry 1. Furthermore, data processing is done using:

a. Microsoft word: This software serves to create a content manuscript.
b. Sigil: This software serves as an editor where we can add media images, audio, and video that we have created which later changed into an Epz file format.
c. Ulite: This software is used for video editing by giving some view effects to make videos look more interesting.
d. Google readium: the google app used to read Epub files can be downloaded in the google app.
b. Gitden Reader: android app used to read Epub can be downloaded Play Store android.

In the preparation of digital books in the course of Organic Chemistry 1, there are several parts of them are:

a. Introduction which includes introduction, table of contents, course objectives, course descriptions, list of topics / subjects, reference books used and the Organic Chemistry 1 course syllabus.
b. Lecture material consisting of carbon compound, stereochemical, alkane and cycloalkanes, alkene and alkynes, alcohol and ether materials, aldehydes and ketones, carboxylic acids, esters, benzene and derivatives.
c. The cover consists of conclusions, suggestions, bibliography, and research biographies.

3.2.3 Expert team validation (expert judgment)

The validity of the assessment in this study refers to the opinion of [10] states that a valid instrument means the measuring instrument used to obtain the data (measure) is valid. Valid means the instrument can be used to measure what should be measured. Assessment of organic chemistry learning media 1 conducted by experts or practitioners through assessment instruments based on existing theories then used as indicators in the assessment is by experts. Experts or practitioners include three expert experts including: material / learning experts and media experts. Material experts who assess the feasibility of learning media is a team of lecturers organic chemistry course 1. Media experts are lecturers who master the media and functional developers LPMP learning technology Bengkulu.

3.2.4 Preparation of a pilot assessment.

Assessment of trial in the form of validation of assessment conducted by media users, among others, students. The assessment sheet is based on indicators of selection of instructional media. A limited trial was conducted with 6 respondent students (semester 3) taking an organic chemistry course 1 to assess the instructional media that had been designed and passed through the validation of the experts. Grid Sheet Product Media Validation Aspects of Materials For Organic chemistry 1:

Table 2. Grid Question Media Validation For Material Experts

Media Validation Sheet Criteria	Indicator	Question number
Lessons	a) Can be used for individual, small and large group learning	1
	b) Topics in the program are clear	2
	c) The learning approach can adjust the students	3
Curicullum	d) Media in accordance with the material taught in learning	4
	e) The media is relevant to the material students are studying	5
Content Contents	f) Material concepts are correct and correct	6
	g) Have a practice or test problem	7
Interactions	h) Program structure is flexible to users	8
	i) The program has a feedback from user-supplied input	9
Reverse	j) Programs have varying responses so users do not get bored.	10

Grid Sheet Product Validation Media Aspects For Media Experts are:

Table 3. Grid Question Media Validation For Material Experts

Criteria of media validation sheet	Indicator	Questions Numbers
Criteria of Program display	a) Display Program	1
	b) Use of Grammar	2, 3
	c) Use of Interactive Functions	4, 6, 12, 13, 14
	d) Grapich	6, 8
	e) Audio	7,11
	f) Animation/video	5,10
	g) Interface design	15,16
Criteria of tecnition qualitty	h) Program Operation	3, 4
	i) User Response	1, 2

Assessment of media experts contains 18 aspects of the questionnaire with the criteria of the material validation sheet which consist of 14 questions and the criteria of technition quality which consist of 4 questions. Grid Sheet Product Validation Media Feasibilitys For Students Experts are:

Table 4. Grid Questionnaire Media Feasibility For Students

Criteria of media validation sheet	Indicator	Question Numbers
Program display criteria	a) Color use	1
	b) The text in the program is clear	2
	c) Program language is easy to understand	3
	d) Sound in the program clearly	4
Content	e) Material concept is correct and correct	6.8
	f) Have practice or test questions	10
Interaction	g) Program has a reverse user-supplied input	9
Reversed	h) The program has a variative response	11,12,13,14

Input from a team of experts include:

1. The table of contents is not perfect layout, need improvement
2. The video display is still truncated because the sizenya is too big
3. Repair the cover

From the input is done digital book repair made:

1. The digital book is repaired both from the introduction, the contents of the material and the cover.

2. For video display, video size is not perfect appearance krn size is too big so need to be converted / resized with application format factory

3. Repair cover both color and writing.

From the results of making digital books, the book is good, but for large classes there are still improvements, including: Repair lay out, letters on the book, color display and the composition of the book and added images that support the content of learning materials so that the book becomes more interesting. For a limited trial it is necessary to prepare apps that support reading digital books e-pub sigil. For example in google chrome the program that supports is the reign.

3.2.5 Preparation of a pilot assessment.

Assessment of trials in the form of validation of judgments conducted by media users ie students. The assessment sheet is based on indicators of selection of instructional media. A limited trial was conducted with 6 semester 3 student respondents who took organic chemistry course 1 to assess the instructional media that had been designed and passed through the validation of the experts.

The feasibility of digital book reviewed by material / learning experts, media experts and students as users / users of learning media through validation of the assessment of instruments, referring to the opinion [10], can be seen in table 5 below:

Table 5. Eligibility Based on Assessment Instruments

No	Appraisal	Result (%)	Criteria	Eligibility
1	Expert material	85	Very Good	Very Decent
2	Media Experts	80,5	Well	Worthy
3	Students (Trial limited)	85,7	Very Good	Very Decent

3.3 Evaluation Stage

The final model is part of the evaluation phase after the digital book validated the assessment by the material / learning expert and the media expert. The development of instructional media in the organic chemistry 1 is inseparable from the role of multimedia that produces an information in the form of images, sounds, and animations so that the role of multimedia is very helpful in information distributors. According [11], seara general multimedia is defined as a combination of text, images, senigrafik, animation, sound and video. Various media are combined into a unity of work that will produce an information that can not only be seen as a printout, but also can be heard, forming simulations and animations that can generate interest and have high graphic arts value in the presentation. [12]suggests that multimedia is divided into two categories, namely: linear multimedia and interactive multimedia. Linear multimedia is a multimedia that is not equipped with any controller that can be operated by the user. This multimedia runs sequentially (sequentially). Interactive multimedia is a multimedia equipped with controller which can be operated by the user so that the user can choose what is desired for the next process. Development of learning media of organic chemistry course 1 especially the practice of referring to interactive multimedia category, that is learning media equipped with controller which can be controlled by user. The development of organic chemical practice media 1 is designed by combining images, sounds, and animations combined into a single unit.

This digital book has the following advantages:

a. Open and free formats are easy to obtain and cheap
b. Tools to read them are available on various devices
c. Can insert video and sound, so that can be enjoyed by learners independently.
d. The appearance is interesting
e. Easy text setting
f. Can be taken anywhere because it is available in the form of files.

4. Conclusion

From the results of research, obtained the results of digital books Organic chemistry 1 for students of Chemistry Education Studies Program FKIP UNIB has been created and validated by a team of experts. The created digital book is judged valid by material validator and media validator by providing 85% success rate (very good criteria) and 80.5% (good criteria). Students as users

state that the media is very well used to learn independently. This is stated in the percentage of student responses to digital book media is 85.7%. Testing by students is only new in limited classes. This digital book has its advantages as follows; open and free format means easy to get and cheap. Tools to read them are available on various devices. Can include video and sound, so that can be enjoyed by learners independently. It looks interesting. Easy text setting. Can be taken anywhere because it is available in the form of files. The resulting digital book needs further revisions to be able to use into large classes.

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