Designing Lectora Based Interactive CD Learning Media in Basic Programming Subjects (Case Study of Class X SMKN 2 Padang)

Indra Wijaya*, Rini Sefriani, Menrisal, Popi Radyuli, and Lili Andrayani
Universitas Putra Indonesia YPTK Padang, Padang, Indonesia
indrawijaya@gmail.com*

Abstract. This research and development aims to produce products in the form of Interactive Media CDs for students of class X majoring in software engineering at Padang State Vocational High School 2 based on the lectora inspire application. The research method used is the method of research and development, using the ADDIE development model. The development steps are: (1) Analysis, (2) Design, (3) Development, (4) Implement, (5) Evaluate. Product development validation includes. The results of the assessment by experts in terms of the aspect of content eligibility: 71.00%, language component: 71.25%, presentation component: 71.00%, graphical component: 71.25%. Overall, the validator test evaluation of the Basic Programming Interactive CD Media is 71.13%, so that the level of validity can be interpreted Fairly Valid to be used. The results of the practicality test assessment in terms of the user state: 80.11%, the effectiveness of learning time: 79.60%, benefits: 80.90%. Overall, the practicality assessment of the Basic Programming Interactive CD Media is 80.20%, so that the practical level can be interpreted as practically used. The results of the effectiveness test were reviewed from the aspect of learning pleasure: 79.08%, the presence of interesting teaching materials in learning: 71.50%. Overall, the assessment of the effectiveness.

1. Introduction
The development of science and technology increasingly encourages efforts to renew the use of technological results in the learning process. At first the use of computers was only focused on data processing, along with current technological advances the use of computers is not only focused on processing data, but also used as a medium of information in various fields, one of which is education. Education is a major factor in the formation of the human person, education plays an important role in shaping the good or bad of the human person according to its normative size. A good education system is expected to emerge the next generation that is qualified and able to adapt to live in the nation and state. Educational reform is a response to the development of global demands as an effort to adapt the education system that is able to develop human resources to meet the demands of the developing era. The quality of education is very important because it will determine the quality of the successor of the nation, which in turn will become the leader of the nation in the future. The quality of human resources increases will be realized if placing education as a means of encouragement and educational aids will have the
meaning and purpose in increasing resources if the education has a system that is relevant to development and good quality in the process and results.

Vocational High School is a secondary level vocational education provided by the government in order to prepare ready-to-use workers. This is in accordance with the instructional objectives of vocational secondary education, namely students are expected to become professionals who have adequate, productive, creative and capable skills in entrepreneurship.

To create vocational graduates who have quality ready to use in their field, efforts are needed to achieve these qualities such as completing facilities and infrastructure, improving the quality of teaching staff, and improving curriculum that emphasizes the development of aspects that lead to improvement and development of life skills (Life Skill) that is realized through the achievement of competencies of students to be able to adapt, and succeed in the future.

One of the subjects taught in Vocational High School especially in the Department of Software Engineering is Basic Programming using computer media as the main media to carry out the learning process. In basic programming learning students are required to be active and be able to master the previous material they learned because the material presented in Basic Programming learning is interconnected and complementary between one material with other material.

Learning media is one of the important components contained in the learning process [1]. The use of learning media should be a part that gets the attention of teachers in learning activities. However, it does not vary and the learning media that are used are not optimal, causing a lack of interest in students to learn. This is very unfortunate, because it is contrary to the purpose of learning media, namely as a learning aid that is useful for streamlining the learning process.

Lectora is very necessary as a learning media that aims to create interactive learning media at SMK Negeri 2 Padang. This is because learning media that have been used in the form of books and learning media using power point still do not support student achievement. Learning media using lectora is expected to be able to increase the attractiveness of students in attending classes at SMK Negeri 2 Padang especially in grade X.

The learning process with learning media using the lectora program is the same thing with the delivery of learning usually in the classroom, but with this learning media the delivery of learning will be easier. Using the lectora application in the learning process has indeed become an option lately, because learning media created with the lectora program can be used to combine text, video, flash / animation, audio, images and so on according to Nur Sidik(2014)[2]. In addition, in making learning media using Lectora users can design how the shape and running of the learning media to make it look attractive.

The use of the lectora software is expected to be able to make interactive CD media so that the material delivered can be responded positively by students. Referring to the existing problems, the researcher is interested in researching the design and manufacture of learning media so that learning is centered on students with the title Design and Making of Lectora-Based Interactive CD Learning Media in Basic Programming Class X Students of Software Engineering at SMK Negeri 2 Padang.

The purpose of this study was to determine Validity, Practicality, and Effectiveness of Lectora-based interactive CD media on Basic Programming subjects in class X RPL of SMK N 2 Padang.

2. Theoretical
A. Interactive Learning Media

Interactive media is a learning media that can stimulate students to carry out active learning activities in the presence of interactive media students can explore, discover, investigate and build their own learning concepts. The media functions for the purpose of instruction where the information obtained in the media must involve students in the form of tangible activities so that students can play an active role in the learning process. According Arsyad (2011) [3] "interactive concepts in learning are most closely related to computer-based". Interactive means having the influence of each other. Computer learning will give students the opportunity to use learning materials that can interact better [4].
Indra Wijaya [5] suggests that interactive media has the following characteristics:

1) Combining several media elements such as text, images, audio, and video.
2) Ability to accommodate user responses.
3) Being independent, in the sense of providing ease and completeness of the content in such a way that users can use it without the guidance of others.
4) Fulfill the function to strengthen user response as soon as possible and as often as possible.

Based on the characteristics of the interactive media, it can be seen that interactive learning media must fulfill its function as a learning medium that is able to accommodate user responses through interaction and generate actions and reactions between the media and its users, so as to strengthen the user response as quickly and as much as the user wants when giving action [6].

Furthermore, creative use of media will increase the possibility for students to learn more. As can be seen in the picture below regarding the cone of Edgar Dale's experience.

![Figure 1. Conical of Edgar Dale's Experience](image)

Based on the opinions of some experts above, it can be concluded that interactive learning media are learning media that can stimulate students to carry out active learning activities with the interactive media students can explore, discover, investigate and build their own learning concepts, because interactive has the characteristics that interactive media can provide feedback to students.

B. Lectora application

Nur Sidik[2] suggests that Lectora is a program for making E-learning or multimedia learning and presentation with computerize, also known as authoring. Lectora software can be used for learning needs both online and offline that can be made quickly and easily. Lectora can be used to combine flash, record video, combine images, and screen capture. Lectora was developed by Trivantis Corporation. Its founder was Timothy D. Loudermilk in Cincinnati, Ohio, America in 1999.

Lectora is very easy to use in developing Interactive Multimedia Learning (MPI) content. In 2000, Lectora became the first AICC certified authoring system on the market. This achievement shows lectora credibility so that it deserves acceptance in the e-learning industry. Since 2000, Trivantis has released the lectora version at the beginning of each year, which contains at least 50 new features. Lectora software was created to enable non-programmer someone to develop product e-learning content the latest version of lectora includes advanced features for experienced users.

According to Nur Sidik (2014: 1) [2], the advantages of Lectora software for Interactive Learning Media (MPI) include:
1) Lectora is used to create websites, interactive e-learning content, and presentations.
2) Content developed with Lectora software can be published to various outputs such as HTML, single file executable, CD-ROM, or e-learning standards such as SCORM and AICC.
3) Lectora is compatible with various learning management systems (LMS).
4) Lectora is very easy to use or User Friendly
5) Has a lot of features that can be used for media development as needed.
6) Have lots of templates
7) Can make evaluations easier and more interesting (compared to Flash and PowerPoint).

The main page of the Lectora Inspire program can be seen as shown below:

![Image of Lectora Inspire program](image)

**Figure 2.** The main page of Lectora Inspire program

3. Method

The design of interactive learning module based on Adobe Director on computer assembly subject for Computer Networking student is a research and development (research and development). According to Sugiyono [7], Development research method is a research method used to produce a particular product, and test the effectiveness of the product. The resulting product is not always in a form like books, stationery, and other learning tools. But it can also be in the form of software (software).

The learning media of Adobe Director’s interactive module is developed using four-D models developed by Thagarajan, Semmel (1974) in Trianto (2011)[8]:
**Data analysis**

Data analysis of this research is done by using descriptive analysis. The analysis includes Interactive-module validity analysis, analysis Interactive module-practice and Interactive module effectiveness analysis.

Interactive module-practice and Interactive-module effectiveness analysis.

1) Provide score answers with criteria based on Likert scale modified by Sugiyono (2013)[7]

| Option         | Bobot |
|----------------|-------|
| Strongly Agree | 5     |
| Agree          | 4     |
| Less Agree     | 3     |
| Disagree       | 2     |
| Strongly Disagree | 1   |

*Table 1. Assessment of Answers*

*Source: Sugiyono (2013 : 93)*

2) Determine the highest score

Highest score = number of validator x number of item x questions maximum score.

3) Determine the number of scores from each validator by summing up all the scores obtained from each indicator.

4) Determine the scores obtained by summing the scores of each validator.

5) Determination of validity value modified from Purwanto (2011) as follows:

\[
NP = \frac{R}{SM} \times 100
\]

Information:

- NP = The percent value sought or which are expected
- R = raw score obtained students
6) Provide an assessment of validity with the modified criteria from Purwanto (2010: 82) follows:

| No | Average Value  | Rated aspect       |
|----|----------------|--------------------|
| 1  | 90%-100%       | Very Valid         |
| 2  | 80%-89%        | Valid               |
| 3  | 65%-79%        | Valid enough        |
| 4  | 55%-64%        | Less Valid          |
| 5  | ≤ 55%          | Invalid             |

Source: Purwanto (2010: 82)

7) Then determine the modified frequency distribution distribution value of prof. Dr. H. Agus I. Irianto [10] as follows:

\[ R = \text{max} - \text{min}. \]

\[ K = 1 + 3.3 \log n \]

\[ P = \frac{R}{K} \]  

(2)

Information:

- \( P \) = Length of interval class
- \( R \) = Calculate the distance or range
- \( K \) = Number of classes

4. RESULTS AND DISCUSSION

A. Design Results

The result of the display design is the design of an interactive CD media interface as a learning resource. The results of the display design can be explained in the following points:

1. Main Menu Page and Instructions for Use

This main menu page is the main page on interactive CD media, there is a menu of instructions, competencies, material, training, profiles and videos. Display These instructions are display usage of Interactive CD Media. The picture of the main menu page and Instructions for Use are as follows:

![Figure 4. Main Menu Page](image1)

![Figure 5. Instructions for use page](image2)

2. Basic Competency Pages and Learning Material Pages

The page contains about Competency Standards, Basic Competencies and learning objectives from Basic Programming Subjects. Material 1 is about determining user requirements, in
material there are several components of material, namely, a) Explaining the meaning and types of data types, b) Explaining the meaning of identifier, c) Explaining about the kinds of basic operations. The picture of the Competency page and the Learning Material Page can be seen below:

![Basic Competence Page (KD)](image1)

![Learning Material Page](image2)

![Practice Question Page](image3)

![Score page](image4)

3. Display Training Questions and Score Pages

This display is a matter of learning exercises in the form of objective questions. Exercise Score display in the form of the results of the answers to questions. The picture of the Exercise Questions and Page Score is as follows:

![Practice Question Page](image5)

![Score page](image6)

B. Analysis of Validity, Practicality, and effectiveness.

1. Analysis of Validity

Interactive media validation from the validator is done to assess the design of interactive media. The validator provides ratings, suggestions and comments on the design of interactive media by filling out the questionnaire provided. Interactive media validation is carried out by 3 assessors. By filling out the feasibility questionnaire for the Basic Programming interactive media, which numbered 20 items, To be more clear, see the Table below:

| No | Kelas Interval | f0 | %f0  |
|----|----------------|----|------|
| 1  | 76-80          | 2  | 66.67|
| 2  | 81-85          | 0  | 0    |
| 3  | 86-89          | 1  | 33.34|
| Sum |                | 3  | 100  |

Based on the Test Results Validity can be explained to look for calculation of class intervals and class length can be seen in the graph below:
The results of the average calculation of the value of the 3 media expert validators is 71.13% and see the table of interpretation criteria, so it is concluded that the validation of the experts in interactive media media on Basic Programming subjects is declared Valid.

2. Analysis of Practicality

Practicality test was used to determine the practicality level of interactive media, practicality tests conducted on 34 students and 1 subject matter teacher. Aspects assessed in Practicality test consisted of 1) readability of interactive media, 2) state of use of interactive media, 3) effectiveness of learning time, and 4) benefits of interactive media. Data on the distribution of Practicality questionnaire scores can be seen in table 5 below:

| No | Kelas Interval | f0 | %f0  |
|----|----------------|----|------|
| 1  | 83-85          | 5  | 14.29|
| 2  | 86-87          | 15 | 42.86|
| 3  | 88-89          | 13 | 37.14|
| 4  | 90-91          | 1  | 2.86 |
| 5  | 92-93          | 0  | -    |
| 6  | 94-95          | 1  | 2.86 |
| Sum|                | 35 | 100  |

Based on Practicality Test Results can be explained to look for calculation of class intervals and class length can be seen in the graph below:
Data on the practicality of interactive media through practical testing of 34 students and 1 teacher of study with a total of 19 items of statements seen an average value of 80.20% can be said to be the level of practicality of interactive media Basic Programming is Practically used.

3. Analysis of Effectiveness
At this stage, activities are focused on evaluating whether interactive media on Basic Programming subjects are developed effectively to enhance learning activities. To get a clear picture of the distribution of questionnaire scores Effectiveness can be seen in table 6 below:

Table 5. Frequency Distribution of questionnaire score Effectiveness

| No | Interval Class | f0 | %f0 |
|----|----------------|----|-----|
| 1  | 40 – 42        | 1  | 2.5 |
| 2  | 43 – 45        | 16 | 46  |
| 3  | 46 – 48        | 17 | 49  |
| 4  | 49 – 51        | 0  | 0   |
| 5  | 52 – 54        | 0  | 0   |
| 6  | 55 – 57        | 1  | 2.5 |
| Sum|                | 35 | 100 |

Based on the Test Results Effectiveness can be explained to find the calculation of class intervals and class length can be seen in the graph below:

Figure 12. Effectiveness Questionnaire Graph

Data on the effectiveness of interactive media on Basic Programming subjects through testing the effectiveness of 34 students and 1 teacher in the field of study with the number of 11 statements seen an average value of 75.29% can be said the level of interactive media effectiveness Basic Programming was declared Effective.

5. Conclusion
Design and manufacture of interactive CD media in Basic Programming subjects following the procedures and development of Sugiyono's 4D Models and (Research and Development) (2013)[7]. Based on the description, data analysis, and the development of interactive CD media applications conducted at SMK Negeri 2 Padang can be summarized as follows:

a. Validity by evaluating validator tests on interactive CD media applications on basic programming subjects is 71.13%, so the level of validity can be interpreted to be quite valid to use.
b. The practicality of interactive CD media applications in basic programming subjects is 80.20%, so the practical level can be interpreted Practically used.

c. The effectiveness of interactive CD media applications in basic programming subjects is 75.29%, so the effectiveness can be interpreted to be quite effective to use.

References

[1] I. Sefriani, Rini. Wijaya, “INTERACTIVE MULTIMEDIA LEARNING MODULE BASED ON ADOBE DIRECTOR ON OPERATION SYSTEM COURSE ON VOCATIONAL HIGH SCHOOL,” INTECOMS, vol. 1, no. 1, 2018.

[2] S. Nur, Membangun E-Learning Mudah dan Asik dengan Lectora. Margasari: eM Tiga Group, 2014.

[3] A. Arsyad, Media Pembelajaran. 2011.

[4] S. R. Wijaya Indra, “Interactive Multimedia CD Design Chemistry Lesson In Concept Training Material and amendment For Class X Vocational High School (SMK),” J. Dyn., vol. 1, no. 1, 2016.

[5] I. Wijaya and F. Tanjung, “Perancangan dan Pembuatan Media Pembelajaran CD Interaktif Berbasis Macromedia Director MX pada Mata Pelajaran Pemrograman Web Dinamis,” vol. 4, no. 2, pp. 207–219, 2017.

[6] indra & S. rini Wijaya, “INTERACTIVE MODULES BASED ADOBE DIRECTOR ON COMPUTER ASSEMBLING SUBJECTS FOR VOCATIONAL SECONDARY SCHOOL,” volt Pendidik. elektro, vol. 2, 2017.

[7] Sugiyono, Metode Penelitian Kuantitatif, kualitatif dan R & D. 2013.

[8] M. A. Hamid, D. Aribowo, and Desmira, “Development of learning modules of basic electronics-based problem solving in Vocational Secondary School,” J. Pendidik. Vokasi, vol. 7, no. 2, pp. 149–157, 2017.

[9] N. Purwanto, Evaluasi Hasil Belajar. Yogyakarta: Pustaka Belajar, 2011.

[10] Irianto Agus, Statistik konsep Dasar, APlikasi dan Pengembangannya, Empat. Jakarta: Prenadamedia Group, 2015.