

# Application Evaluation of Simulation of Agribusiness Concept of Livestock (SPEKTRUM) at SMK Al Jauhar Ngawi, East Java

Marya Mujayana<sup>1</sup>, Endra Rahmawati<sup>2</sup>  
Computerized Office and Secretarial Diploma<sup>1</sup>, Information System<sup>2</sup>,  
Institut Bisnis dan Informatika Stikom Surabaya  
ana@stikom.edu<sup>1</sup>, rahmawati@stikom.edu<sup>2</sup>

**Abstract** – The objective of this research is to evaluate the students' understanding on the concept of livestock agribusiness using application of Simulation of Agribusiness Concept of Livestock (SPEKTRUM). To build the application, the method used is Luther Models Multimedia Development Lifecycle. This method was chosen because it has been widely used to create similar learning applications. To determine the degree of differences in students' understanding the material between before using the application and after using the application, the researchers add evaluation menu on SPEKTRUM application to assess the students' final outcome. The evaluation menu in the application uses a multiple-choice question form. Test of evaluation menu was conducted to 35 students of SMK Al Jauhar Ngawi. The total 35 students, the average value generated without using the application was 67.71. While the average value generated after the students use the application was 76.28. Thus, there is an increase in students' score as much as 8.57 points compared to without using the application. Based on this result, it can be concluded that SPEKTRUM application can help to improve students learning outcomes in SMK Al Jauhar Ngawi.

**Keywords:** Evaluation, Simulation of Livestock Management, Agribusiness, Cattle.

## I. INTRODUCTION

This study took a case study at SMK Al Jauhar Ngawi, because it is the only Vocational High School majoring in Livestock Agribusiness in Ngawi District. The purpose of education in a vocational school tends to focus on how to prepare students to be able to work in certain areas as workers / employees [1]. SMK Al Jauhar Ngawi also prepares the students to be able to open their own business after graduation, especially in the field of animal husbandry.

The school stated that they have difficulty in doing practice of the process of cattle farming in the field because the land provided is not proportional to the number of students and cost constraints are quite high. For vocational schools majoring in livestock agribusiness, it is not easy to give examples of how to apply good farming cultivation to their students. On the other hand, breeders should spend

approximately 70% of the production cost for feed costs [2] [3].

The farms are currently only built on very limited land [4]. Thus, students majoring in livestock will do the practicum to the location of the cattle ranchers which are outside the school location [5]. To assist the learning process with a simple simulation, this research builds an application of Simulation of Agribusiness Concept of Livestock (SPEKTRUM). This application presents a simulation process designed with characteristics ranging from types of livestock, feeding, cow weighting, cattle breeding, livestock distribution in Indonesia, processed cattle, and marketing and profit calculations.

This learning application is intended for teachers in the process of delivering the materials in the classroom, so that the students can know the proper cultivation model to manage the farm before going directly to the field. This app is created using the concept of multimedia. Multimedia is an element that can increase the motivation or interest in understanding the material presented by the teachers [6].

Various previous researches on simulation application of livestock feeding calculation have been done, such as application to calculate the weight of livestock and livestock recording [7]. In addition, there is also a research on Java-Based Visual Programming Application of Chicken Ranch in Independent Chicken Farming [8]. The application has an optional menu for livestock data input, livestock sales data, and nutrition feeding calculation, as well as analysis of chicken breeding profits based on breeding chickens and selling prices.

To know the degree of differences in students' understanding between before and after using the application, researchers added SPEKTRUM evaluation menu to assess student outcomes. This evaluation menu in the application uses a multiple-choice question form. The evaluation test was conducted to 35 students of SMK Al Jauhar Ngawi.

## II. RESEARCH METHODS

### A. Software Development with *Luther Models*.

Based on the analysis of the situation and background, The main problem that is found is the difficulty of applying cattle breeding due to the lack of land and high constraints for the school. Thus, the solution offered is the development of Application of Simulation of Agribusiness Concept of Livestock (SPEKTRUM) by specializing in cows.

To build the application, the method used is *Luther Models Multimedia Development Lifecycle*. This method was chosen because it has been widely used to create similar learning applications [6][9].

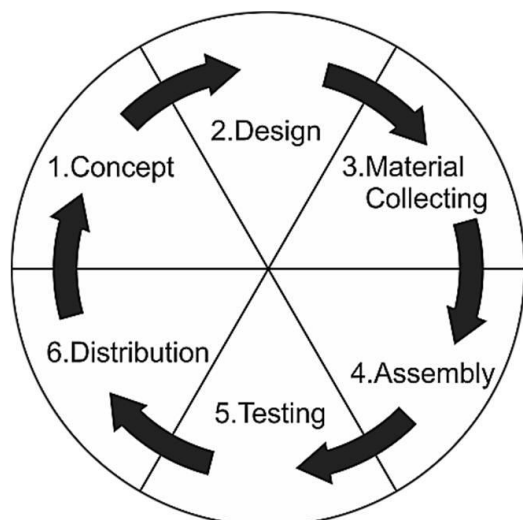


Fig 1. Stages of Multimedia Application Development.

The stages in making the learning application using *Luther Models*, are as follows:

#### 1. Concept

The concept stage is a step to identify the needs of users (teachers and students). The end goal of the users is to simulate the management of cattle for the needs of learning in school.

#### 2. Design

Tahapan design ini merupakan tahapan untuk membuat daftar spesifikasi arsitektur program seperti pembuatan *storyboard* dan diagram alir. This design stage is the stage to create a list of programming architecture specifications such as storyboard creation and flowchart.

#### 3. Material Collecting

This stage of collecting materials is the stage for collecting application supporting files, such as images (images / clip art), additional animations, audio / music that can be designed by image processing applications such as Adobe Photoshop or Corel Draw.

#### 4. Assembly

The assembly stage becomes an important stage of all stages, namely the development of multimedia applications by including all contents and material collecting in accordance with the storyboard that has been made.

#### 5. Testing

This stage is a stage that serves to test whether the application is in accordance with the wishes and goals of the users or not. To determine the level of understanding between students before using the application and after using the application, the researchers add SPEKTRUM evaluation menu to assess the students' outcome. This evaluation menu in the application uses a multiple-choice question form.

#### 6. Distribution

This stage of distribution becomes the last stage for distributing applications to teachers and students for the learning process.

The application of Simulation of Agribusiness Concept of Livestock (SPEKTRUM) uses projected media concept, because it is applied to the computer / laptop of the learners.

## III. RESULTS AND DISCUSSIONS

### A. The implementation of Application of Simulation of Agribusiness Concept of Livestock (SPEKTRUM)

This research has been able to produce an application of Simulation of Agribusiness Concept of Livestock (SPEKTRUM) with 7 main menus. Figure 3.1 shows the opening page of the SPEKTRUM Application and Figure 3.2 shows the menus provided in the application.



Fig 2. the opening page of the SPEKTRUM Application

There are 7 menus that can be accessed in this application, namely types of livestock, feeding, cow weighting, cattle breeding, livestock distribution in

Indonesia, processed cattle, and marketing and profit calculations. Addition is done by adding the SPEKTRUM Evaluation Menu located at the bottom of the 7 menus for testing to the students.



Fig 3. Main Menu Page of SPEKTRUM

### 3.2. Results of Application Evaluation and Students' Value Comparison

To find out the level of differences between the students understanding before using the application and after using the application, the researchers add SPEKTRUM Evaluation Menu to assess the students' final outcome. The value of the Evaluation Results before using the application has been done by the teacher during the Mid Semester Exam.



Fig 4. Spektrum Evaluation Menu – Multiple-Choice Questions



Fig 5. Spektrum Evaluation Menu that has already been done by the student.

TABLE 1 THE RESULTS OF STUDENTS' EVALUATION

No.	Score Range	Predicate	Number of students - Exam before using the application	Number of students - Exam after using the application
1.	96 – 100	A	-	5
2.	91 – 95	A-	4	
3.	86 – 90	B+	-	2
4.	81 – 85	B	4	
5.	75 – 80	B-	-	11
6.	70 – 74	C+	8	10
7.	65 – 69	C	1	
8.	60 – 64	C-	9	6
9.	55 – 59	D+	9	
10	< 54	D	-	1
		Total of students	35 students	35 students
		Average Scores	67.71	76.28

The SPEKTRUM Evaluation Menu in the application uses the multiple-choice question form (see Figure 3.3). Evaluation Menu Testing was conducted on 35 students and differences of comparison results without or with using application can be seen in Table 3.1.

There are differences in the students' values from the table above. The scores of the exam before using the application were taken from the students' mid-test where the learning process did not use the application.

Of the total 35 students, the average value generated without using the application was 67.71. While the average value generated after the students use the application was 76.28. Thus, there is an increase in students' score as much as 8.57 points compared to without using the application. Based on this result, it can be concluded that SPEKTRUM application can help to improve students learning outcomes in SMK Al Jauhar Ngawi.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

##### A. Conclusions

From the research of making the application, it can be drawn some conclusions as follows:

- a. The application of Simulation of Agribusiness Concept of Livestock (SPEKTRUM) can be used as a learning tool that can help teachers and students to apply the knowledge obtained, especially in the field of cattle farming.
- b. The application of Simulation of Agribusiness Concept of Livestock (SPEKTRUM) has been evaluated through student learning outcomes that have increased students' values as much as 8.57 points compared to without using the application.

##### B. Suggestion

A suggestion that can be done for the development of the research and application is to create a similar application based on the website.

#### V. ACKNOWLEDGEMENT

Foremost, we would like to express our sincere gratitude to Ministry of Research, Technology and Higher Education of the Republic of Indonesia for supporting us by giving funding to this research. Our sincere thanks also goes to SMK Al Jauhar Ngawi for allowing us to do the research to their students. Last but not the least, we would like to thank Institut Bisnis dan Informatika Surabaya for always motivating us to do the research.

#### REFERENCES

- [1] Slamet PH, 2013, "Pengembangan SMK Model Untuk Masa Depan, Februari 2013, Th XXXIII, No. 1," *Jurnal Ilmiah Cakrawala Pendidikan*, Hal. 14-26.
- [2] Paul., et al Crosson, 2016, "The Development of a Simulation Model To Cost Home Produced Feeds For Ruminant Livestock," *Technology Updates Animal & Grassland Research and Innovation Publication. Teagasc, Oak Park, Carlow, Ireland.*
- [3] Hartanto, 2008, "Estimasi konsumsi lahan kering, protein kasar, total digestible nutrien dan sisa pakan pada sapi Peranakan Simmental," *Agromedia*, vol. 26(2), pp. 34-43
- [4] Husni, M.D., Permana, Soleh., Muslihudin. 2016. *Implementasi Model Luther Pada Pengembangan Aplikasi Pembelajaran Tata Surya Berbasis Android*. Jurnal VOI, STMIK Tasikmalaya. Vol.5, No.2 hal 79-90.
- [5] Ika, Humas UGM. 2012. *Peternakan Sapi Indonesia Masih Kekurangan Lahan*. (<https://ugm.ac.id/id/berita/4629-peternakan.sapi.indonesia.masih.kekurangan.lahan>)
- [6] I Made Dwika., Gede Agung, Anak Agung., Wawan Sudatha, I Gde Handikha, 2013, "Pengembangan Multimedia Pembelajaran Interaktif Model Luther Pada Mata Pelajaran IPA Kelas VIII Semester Ganjil Tahun Pelajaran 2012/2013 di SMP Negeri 1 Marga Kabupaten Tabanan," *Jurnal Edutech (Jurnal Jurusan Teknologi Pendidikan)*, Vol. 1, No. 2.
- [7] Didik., Salasa, Mukarom Yusuf. (2013) Software Kalkulator Penghitung Bobot Ternak dan Recording Ternak. Artikel Lembah Gogoniti Farm. [Online]. <http://www.lembahgogoniti.com/artikel/65-software-peternakan/129-software-kalkulator-penghitung-bobot-ternak.html> dan <http://www.lembahgogoniti.com/artikel/65/134.html>
- [8] Anshar Firman., dkk Haryadi, 2013, "Pemrograman Visual Aplikasi Peternakan Ayam Berbasis Java di Peternakan Ayam Mandiri," Pendidikan Teknik Informatika, Jurusan Elektronika, Fakultas Teknik, Universitas Negeri Padang, Tugas Akhir.
- [9] M.D., Permana, Soleh., Muslihudin Husni, 2016, "Implementasi Model Luther Pada Pengembangan Aplikasi Pembelajaran Tata Surya Berbasis Android," *Jurnal VOI, STMIK Tasikmalaya*, vol. Vol.5, No.2, hal 79-9