

Virtual Laboratory Management Model: Improving the Competence of Hair Beauty LKP Instructors In Sumatera Utara

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Abstract: This study aims to determine the process of research product development, and hair beauty virtual laboratory management model to improve the competency of LKP hair beauty instructors. The research approach applied in product development is research and development (R&D). This development model is carried out in 8 stages, namely: Research and Information Collecting, Planning, Develop Preliminary Form of Product, Preliminary Field Testing, Operation Field Testing, Operational Product Revision, Main Field Testing, and Main Product Revision. The subject of the trial was a level II hairstyling instructor in the city of Pematangsiantar. The instrument used to collect data in this development research is a questionnaire or questionnaire. The results showed that the hair beauty virtual laboratory management model that was developed effectively could increase the creativity of instructors which was supported by the acquisition of validation scores by material experts of 86.4% and media experts obtained a percentage of 80.7% with a very good category and effectiveness experts obtained results 97.50%. In addition, the results of the respondents from the acquisition of scores for the small group trial of 5 students were 78.3% in the good category, the medium group trial with 15 learning residents was 81.3% in the very good category, and the large group trial with 30 learning residents was 93.6% with a very good category. This means that this virtual laboratory is feasible to use.

Keywords: e-module; biomedicine; learning media

1. INTRODUCTION

Learning media is involved in the process of learning and teaching is something that cannot be separated from the unity of the world of education. Learning media are all things that can be used to convey the message of the sender to the recipient so that it can stimulate the thoughts, feelings, attention, and interests of students for learning [1]. Learning media plays an important role in the learning process so that it can improve the quality of education. In addition, the use of learning media in the mathematics learning process can increase the motivation and interest in learning among students who learn independently.

Life skills education is broader than work skills, let alone manual skills. Life skills education is an educational concept whose aim is to intuitively prepare learning citizens to have the courage and willingness to face life and life problems naturally without feeling distracted and then creatively come up with solutions as well as be able to remember them. The indicators included in life skills are conceptually grouped: (1) self-awareness or, concurrently, personal skills, (2) thinking skills or academic skills, (3) Social skills, and (4) Vocational skills are also associated with technical skills or technical skills.

Problems that have been encountered in the world of non-formal education, namely the way of teaching instructors which are valued in a way that results in a lack of knowledge of students studying in the field of material, especially in hair beauty subjects, namely negative responses to practical exams during competency tests with practical results in DUDI. Residents learn to think that practice while in DUDI is not the same as during the competency test. Instructors think that the learning community must be aware of practical learning so that many instructors only discuss practical results without being

reinforced by theoretical studies so that when teaching the instructor makes less use of learning media. Indirectly, the opinion causes the learning community to become lazy to intuitively try to understand concepts and theories both materially and clearly practice their lessons in SKKNI.

This problem of proficiency also becomes a problem as well as training students because of course achieving good skills for all student's learning becomes a difficult thing, because in their learning it is certain that there are students who experience difficulties in the learning process and this difficulty can be overcome by students pa similar thing, infrastructure, teacher competency, instructor competency, and learning process. Like the presentation of Manik and Panjaitan [2] in his research results showed that "Discipline, passion and teaching methods of instructors are necessary things, but this is not a sufficient requirement possessed by an instructor to be able to increase the value of the PLPG participant competency test" in From the results of this research, it can be seen that the instructor is not only with discipline, enthusiasm and teaching methods that can affect the learning outcomes of many other things that affect the instructor, of course, this instructor competence should be owned by every instructor who will carry out the training. The instructor is one of the important elements that must exist in a series of learning activities in training.

1.1 Hair Beauty Instructor Competency Level II

In the training process, a competent teacher or instructor is needed so that students can learn effectively and efficiently, to achieve the expected goals. This is emphasized again by Hamalik [3] who defines the educator or instructor as follows: The educator or instructor is a person who works as an educator in an educational and training institution and has a certain

amount of competence to teach students, as well as so that it can achieve the intended goals, namely so that the teachers of the students can improve their skills in work.

Being able to plan the presentation of learning materials based on appropriate reference standards is an absolute requirement of competence that instructors must master. The instructor can stimulate learning media to intuitively process the learning process according to existing competencies. The instructor can master the class when teaching. Instructors are also expected to be able to motivate the learning community.

Instructor Skills Competition Goals Instructor Skills Competition is Intuitive: Providing encouragement and opportunity for instructors to compete positively and constructively, to increase pride in their profession and unit of work. Inquiry and monitor the competency map of BLK UPTP/UPTD instructors by their field of expertise. Give input in planning the instructor development program in the future. Motivating instructors to increase their competence both individually and in terms of officialdom in their respective agencies. Fostering and enhancing cooperation between fellow instructors and trainers at Work Training Centers, both at the regional and central levels.

Adding insight and competitive experience to instructors and managers of the Work Training Center and Competition

Development, so that BLK is preparing potential Asian Skills Competition (ASC) competitors and can prepare themselves for trainer competitions at the Southeast Asian level or a wider level. As a medium for exchanging experiences and information related to science, technology, and the world of training. Meimpeireirat is related to cooperation between the government, industry, and education and training institutes. Increase national insight and love for the motherland. Regional-level Instructor Skills Competitions are Work Training Institute Instructors in designated regional areas, and National-level Skills Competitions are Work Training Institute Instructors at regional level competitions.

Hair beautification is a program that creates a pool of reliable human resources in the field of hair cosmetology. The increasing population of people has resulted in more job opportunities for quiz graduates as well as hairdressing training to increase the skills needed for hairdressers. The most important goal of the program is to gain expertise, both theoretically and practically in aspects of hair beauty design. The learning activity program for the Hair Beauty Management Quiz is packaged in the form of levels, namely Basic, Skilled and Advanced levels with separate qualification levels and independent positions. Each level has a program structure consisting of 1 (general), 2 (Core), and 3 (special)

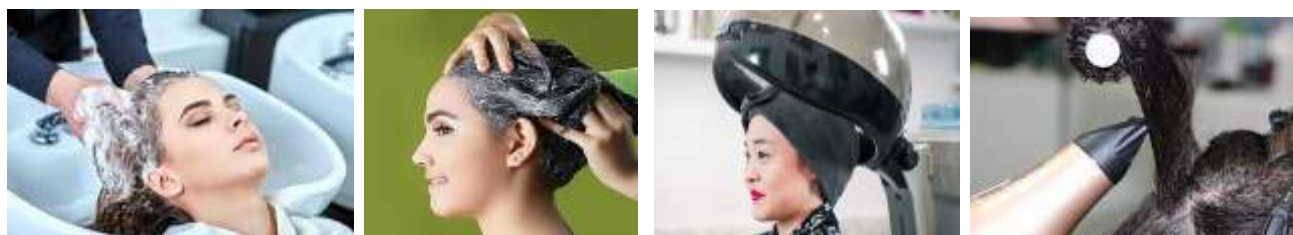


Figure 1. Hair beauty skills

1.2 Virtual Laboratory Management

Laboratory infrastructure is a part that together becomes the main obstacle. The maintenance of infrastructure is not only a matter of cost and time but also the continuity of management which is quite complex, especially for LPK with limited resources (land, workers, funds, time). Several other things that are considered to be a problem in laboratory management include the role of (1) Laboratory Resources: including practical equipment, laboratory workers/technicians, supervising instructors, practical assistants, and practical places, (2) Laboratory Management: How is the management of practice time becomes easy, both from the management side and the laboratories supervisor). How can students maximize the use of practical hours, (3) Practical Costs: How to reduce practical costs to a minimum, considering that the price of practical materials that have changed has increased, certainly without reducing the quality of the results of the internship, as well as (4) Increasing the quality/competence of students with good limited power supply in the laboratory [4].

For teachers/teachers balancing the system will have several academic skills such as time and a more flexible practice location, without reducing practical competence in the competencies students acquire. Some of the research on virtual laboratories that existed previously as virtual laboratory balancing studies can be seen from several circuit implications. Virtual laboratories or what can be called virtual labs are a

series of laboratory tools that are in the form of interactive multimedia-based computer software, which are operated with a computer and can simulate activities in the laboratory as if the machine is in the laboratory. as true. The intuitive virtual potential laboratory provides a significant improvement and a more effective learning experience.

It is hoped that this virtual laboratory balance can solve the learning problems experienced by students and overcome the problem of costs in procuring tools and materials used to carry out practical activities for underprivileged schools. Through multi-media learning in the form of a virtual laboratory, in general, the benefits that can be obtained are that the learning process becomes more interesting and more interactive, the amount of teaching time can be reduced, the quality of learning can be improved and the learning process can be done anywhere and anytime. In addition, through virtual laboratories, research costs can be reduced, as well as research that was previously impossible to do, due to system conditioning limitations, now it can be done.

Meinuiruit Ferreira [5], some of the benefits that can be obtained by using online virtual laboratories are (1) Reducing time constraints, if there is not enough time to teach all students in the lab so that they understand, (2) Reducing geographic barriers, if there are learning residents or students who are located far from the learning center (campus), (3) Economical, does not add to the lab building, tools, and materials similar to

conventional laboratories, (4) Improves the quality of the experiment, because it allows the tutorial to be repeated for clarity doubts in teaching in the lab, (5) Increasing the effectiveness of learning, because students or students will spend more and more time in the virtual lab with lots of repetitions, and (6) Increasing security and safety, because they do not interact with tools and chemicals that real. The advantages of using online Virtual Labs are (1) Students must

be online (interconnected internet) to intuitively simulate a practical practice, (2) Limited knowledge of how to carry out online practicums because most of the Virtual Labs service providers use English as a language reminder, (3) Lack of real experience in real laboratories, so there is confusion among students in designing tools and operating them, as well as (4) Virtual laboratories do not provide real experience in the field.



Figure 2. Level II Hairstyling Virtual Laboratory Management; (a) Covers; (b) Virtual Laboratory Menu; (c) Virtual Laboratory Materials; (d) Video Virtual Laboratory; (e) Virtual Laboratory Profile; and (f) Virtual Laboratory Attendance

1.3 Course And Training Institute (LKP)

Course And Training Institute (LKP) is a non-formal education unit organized for people who need the provision of knowledge, skills, life skills, and attitudes to balance themselves, balance professions, work, work independently, and/or continuing education to a higher level which can organize non-formal education programs as a series (according to Peirmeindikbuid No. 81 Tahun 2013 concerning the Establishment of Non-Formal Education Units): Life skills education; Scientific education; Women empowerment education; Literacy education; Work skills education; Equality education; and Other non-formal education needed by the community.

By Law No. 20/2003 article 26, non-formal education (which includes LKP) functions as a replacement, enhancement, and/or complement to formal education, in the context of imparting lifelong education to balance the potential of students with students. fish on knowledge mastery and functional skills along with a balance of attitude and professional personality.

LKP as a unit of non-formal education must be managed very carefully to be able to produce quality output, it is more important for us to understand that the backgrounds of non-formal education participants are mostly those who have less economics, they do not have the opportunity to continue studying formal education due to cost and several among them poetic students formal school and unemployment. So it is very ironic if LKP's fluids are managed with no quality. Of course, there are already many LKPs that have been managed well, but it's not a mistake if we try to think of the better side and always be positive in thinking and responding to every effort to achieve a better result.

Since then, the skills/knowledge quizzes have been known as the Outer School Education Quiz which is organized by the Community (PLSM or Dikluiseimas). Keipmeindikbuid establishes PLSM development by (1) planning various types of education, their goals and functions; (2) standardizing institutions that include the content and quality of lessons as well as the teaching and learning tools; (3) planning to increase

the quality of trainers/ tutors and their teachers; (4) observing the standards and procedures for administering exams, assessments and diplomas; and (5) monitoring and supervising agency licensing as well as keeping track of its balance. The Ministry of Education and Culture has also appointed the Director General of Outdoor Education, Schools, and Sports within the scope of the tasks and jurisdictions involved in the development: (1) is in charge of and responsible for the implementation of the PLSM technical development in a comprehensive manner too increase the quality and expand services community education, and (2) researching the basic pattern of PLSM development both at Central and Regional Centers.

Improving the quality of LKP is very important, because many LKP students come from underprivileged families, school poets, and the unemployed, who expect non-formal education to become the provision to earn income, either by working or having a business venture. The Quiz and Training Institute aims to balance oneself, balance the profession, work, independently start a business, and continue education at a higher level. The national education balance policy is aimed at realizing an education that is just, qualified, and relevant to the needs of society.

According to the Directorate of Course Development and Training, there are several efforts to achieve this goal in the implementation of national education which are based on five educational missions: (1) Availability of various educational service programs; (2) Affordable education costs for the whole community; (3) The quality of each type and level of education is increasing; (4) There are no differences in education services in terms of various aspects; (5) Guarantees for graduates to continue and alignment with the world of work. The benefits of the LKP program include: (1) Balancing the interests and talents of the community; (2) As a forum for getting and looking for work; (3) Developing the profession; (4) Being able to do business independently; (5) Developing a career: (6) Strengthening educational activities, and (7) Continuing education to a higher level to become a professional in their field.

The research problem is formulated as follows: (1) How is the feasibility of virtual laboratory management developed to improve the competence of hair beauty instructors in North Sumatra?; and (2) How effective is the virtual laboratory that was developed to improve the competence of hair beauty instructors in North Sumatra?

2. METHOD

This research was conducted to produce a Virtual Laboratory for level II hairstyling. According to Borg and Gall in Sugiyono [6] states that this type of research includes research and development (Research and Development) which is concurrently known as R & D research, which is a type of research that develops a new product or perfects an existing product.

According to Sugiyono [7] research and development are research methods used to produce certain products and test the effectiveness of these products. Agustiana, et al [8] also stated that simply explained R & D can be defined as a research method that is intentional, systematic, aims or directed to find, formulate, improve, develop, produce, and test the effectiveness of products, models, methods/strategies/ ways, services, certain procedures that are superior, new, effective, efficient, productive, and meaningful. A similar understanding was put forward by Neuman [9] that development research in learning is a process used to develop and validate the products used in the learning process.

To be able to produce certain products, research is used which needs analysis in nature to test the effectiveness of these products so that they can function in the wider community, so research is needed to test the effectiveness of these products. The main steps of the learning system design model proposed by Dick & Carey are as follows.

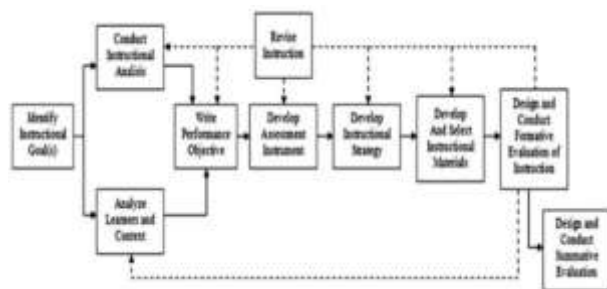


Figure 3. Dick and Carey's Instructional Design Model

This research was conducted on 30 hairstyling LKP instructors in the city of Pematangsiantar. Each LKP of hairstyling in the city of Pematangsiantar has two instructors. This research was carried out in the Hall of LKP AYU Pematangsiantar.

Table 1. The number of LKP in the city of Pematangsiantar

No	LKP name	Number of Instructors
1	LKP Ayui Salon	5 People
2	LKP Vineisa	3 People
3	LKP Zeinro	3 People
4	LKP Cacaya	2 People
5	LKP Beiauity	2 People
6	LKP Tora	2 People
7	LKP Wuilan Salon	2 People
8	LKP Gabriel	2 People

No	LKP name	Number of Instructors
9	LKP Malona	2 People
10	LKP Farida	2 People
11	LKP Ayui Dairi	2 people
12	LKP Vins	2 people
13	LKP Yuis	2 people

Source: Data from the Pematangsiantar City Education Office 2022

The development procedure used in this study adapts the Dick and Carey instructional development steps to the following development steps:

1. Preliminary Stage. The initial stages that will be carried out at this research stage are: (a) Carry out preliminary observations or studies to see firsthand how the learning process is in LKP Hair Beauty in Pematangsiantar; (b) The learning process held at LKP Beauty Hair in Pematangsiantar; (c) Arranging the learning structure/learning structure in LKP Hair beauty in Pematangsiantar.
2. Stages of Implementation. The stages of implementation carried out by researchers: Conduct trials; Record the number of instructors who are in the trial room; Do the opening; Conduct virtual laboratory trials to instructors
3. Product Trial Stage. Trial design. The trial design in this study has stages, namely: Validation of Level II Hairstyling material experts (National Examiners of Competency Certification Institutions); Media expert validation; Effectiveness expert validation; Conceptual analysis; Development revision (stage I), based on an assessment in the form of input, criticism, and suggestions from material experts, media experts, and effectiveness experts for improvement; Trials one – one / individual; and Conceptual Analysis.

Data collection was carried out using a questionnaire distributing questionnaires to respondents, namely material experts, media experts, design experts, and student responses. The respondents assessed the quality of the Hairstyling Virtual Laboratory with the provisions of the research criteria in Table 2 below:

Table 2. Questionnaire Sheet Table

Criteria	Score
Very good	5
Good	4
Enough	3
Not good	2
Very bad	1

(Source: Arikunto [10])

Table 3. Expert Validation Questionnaire Assessment Qualification Criteria, and Student Response Instruments to the Hairstyling Virtual Laboratory

Percentage of Achievement Level	Eligibility	Description
$80\% \leq X < 100\%$	Very Valid	No Need Revision
$60\% \leq X < 79\%$	Valid	No Need Revision
$40\% \leq X < 59\%$	Valid Partial	Partial Revision
$20\% \leq X < 39\%$	Less Valid	Revision
$0\% \leq X < 19\%$	Very Invalid	Revision

(Source: Arikunto [11])

Based on the quantitative data from the results of the validator by material experts, media experts, and student response questionnaires, the next step is to analyze the data and calculate the percentage level of achievement based on the formula:

$$P = \frac{\sum x}{\sum xi} \times 100 \%$$

Information:

x : The answer score from the validator

xi : Score the highest answer

Q : Presentation of eligibility level

The feasibility and effectiveness criteria achieved were used in the development of the Hairstyling Virtual Laboratory described in the following table 4.

Table 4. Eligibility Criteria for Hairstyling Virtual Laboratory

No	Score in Percentage (%)	Eligibility Category
1	$80 \leq P < 100$	Very Eligible
2	$60 \leq P < 80$	Eligible
3	$40 \leq P < 60$	Adequate
4	$21 \leq P < 40$	Inadequate
5	$0 \leq P < 21$	Very Inadequate

The learning media for the Hairstyling Virtual Laboratory that was developed received a positive response from students if the percentage obtained from the student response questionnaire reached a score of $\geq 60\%$, then the Hairstyling Virtual Laboratory learning media was categorized as feasible and effective.

3. RESULTS AND DISCUSSION

3.1 RESULTS

The results of the assessment by media experts, material experts, individual trials, small group trials, and limited field trials for all aspects of the assessment are determined by the average score. The results of the assessment are then analyzed and determined whether or not it is appropriate to develop learning media for the Hairstyling Virtual Laboratory. The average percentage of the results of the assessment of media experts, material experts, individual trials, small group trials, and field trials is as follows:

Table 5. The average percentage of the results of the assessment of the hairstyling virtual laboratory learning media

No	Categorization	Percentage of average score %	Criteria
1.	Material Expert Validation	88,70	very feasible
2.	Media Expert Validation	83,30	very feasible
3.	Learning Design Validation	90,00	very feasible
4.	Individual Trial	78,30	very feasible
5.	Small Group Trial	81.30	very feasible

No	Categorization	Percentage of average score %	Criteria
6.	Field Testing	93,60	very feasible
The average		86,78	very feasible

The hairstyling Virtual Laboratory learning media shows that: Material Expert Validation is 88.70% very feasible category; Media Expert Validation of 83.30% very feasible category; Learning Design Validation of 90.00% very feasible category; Individual Trial of 78.30% very feasible category, Small Group Trial of 81.30% very feasible category; Field trials of 93.60% very feasible category, an average of 86.78% very feasible category. which means that the use of hairstyling Virtual Laboratory learning media meets the needs of students.

3.2 DISCUSSION

Based on observations and studies during the research, a level II hairstyling virtual laboratory can increase the instructor's creativity in teaching and learning hairstyling level II. This can be seen from the enthusiasm of the learning residents to use the virtual laboratory and the learning outcomes of the learning residents are better than before.

The feasibility test of the level II hairstyling virtual laboratory can be seen from the validation results of material experts, design experts, effectiveness experts, and media experts, where the average material expert validation is 90.00%. Assessments from material experts, model experts, and media experts show that the virtual laboratory is in the very good category and is feasible to try out.

Supported by Iskandar's research [12] concerning the Development of a Mobile Virtual Laboratory Model for Practicum Learning for High School Students states that: The comparison between the number of schools and/or students and practicum laboratories has not been proportional. The virtual lab learning media that has been developed cannot accommodate the mobility of learning that can be done anywhere and anytime. For this reason, this study aims to develop a mobile virtual lab with the target of SMA. So get a quality application and feasible to be used in learning. Taking into account the results obtained, it is recommended that the mobile V-Lab be further developed.

In Iskandar's 2018 v-lab research, what is meant is almost the same as a virtual laboratory. The results of Salamah's research [13] state that the Application of Virtual Laboratories Increase Students' Conceptual Understanding. The application of virtual laboratories to students' conceptual understanding of reaction rate material. Conceptual understanding is included in the dimensions of cognitive processes. So it was concluded that there was a significant difference between the average post-test scores of the experimental group and the control group. This shows that there is an effect of implementing a virtual laboratory on students' understanding of concepts.

The same thing is the result of Kurnia's research [14] stating that the Development of Virtual Laboratories as Learning Media: Opportunities and Challenges. The laboratory is a source of learning and learning media. The purpose of this research is how is the urgency of the laboratory as a learning medium and what are the opportunities and challenges of the virtual laboratory as a pedagogical framework overview.

Therefore researchers are interested in conducting studies on this matter. This research uses a type of library research and is qualitative in nature. The results of this study are the laboratory is a place for activities needed in practice, often used as a standard for instructor success. Virtual laboratories have a significant impact in terms of preparing instructors for real experiences, as well as savings in the cost of procurement and maintenance of equipment, location flexibility, learning time, and practice.

Because it was proposed an increase for LKP and Instructors so that a Virtual Laboratory was needed like the opinion above. Virtual labs can provide upgrades for Level II Hairstyling LKPs. So that it provides benefits, namely: (1) Developing community interests and talents, (2) As a forum for getting and looking for work. (3) Developing the profession. (4) To be able to do business independently, (5) Develop a career, (6) Strengthen educational activities (7) Continue education to a higher level so that they become professionals in their fields.

Likewise, it also provides several objectives in the implementation of national education that is based on five educational missions: (1) Availability of various educational service programs, (2) Affordable educational costs for all people, (3) Increasing quality of each type and level of education, (4) Without differences in education services in terms of various aspects, (5) Guarantees for graduates to continue and harmony with the world of work.

Multimedia Learning in the form of a virtual laboratory, in general, the benefits that can be obtained are that the learning process becomes more interesting, more interactive, the amount of teaching time can be reduced, the quality of learning can be improved and the teaching and learning process can be carried out anywhere and anytime. In addition, through virtual laboratories, research costs can be saved, and research that was previously impossible to do, due to system conditioning limitations, can now be done.

Farreira [15] some of the benefits that can be obtained by using an online virtual laboratory are (1) Reducing time constraints, if there is not enough time to teach all students in the lab until they understand, (2) Reducing geographical barriers, if there are learning residents or Students who are located far from the learning center (campus), (3) Economical, do not need lab buildings, tools, and materials as in conventional laboratories, (4) Improve the quality of experiments, because it allows it to be repeated to clarify doubts in measurements in the lab, (5) Increase the effectiveness of learning, because learning citizens or students will spend more and more time in the virtual lab, and (6) Increase security and safety, because they do not interact with real tools and chemicals.

4. CONCLUSION

After carrying out the process or stages of developing a virtual laboratory management model, the following conclusions can be drawn:

1. Development of a level II hairstyling virtual laboratory management model to increase the creativity of LPK hairstyling instructors suitable for use.
2. Development of a level II hairstyling virtual laboratory management model to increase the creativity of LPK hairstyling instructors to effectively use it.

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