



HYLED 5.0 (Hybrid Laboratory based on Education 5.0) Learning Model to Improve Writing Skill based on Environmental Issue

Tatas Transinata¹, Rati Riana², Muhammad Burhan Hanif³

^{1,2,3} Universitas Semarang, Indonesia
tatastransinata@gmail.com

ABSTRACT. Hybrid Laboratory is a media that facilitates online and offline learning models with the integration of technology and constructive learning. The aim of this research is to develop a learning model based on Education 5.0 with a Project based Learning model and to analyze the effectiveness of HYLED 5.0 (Hybrid Laboratory based on Education 5.0). HYLED 5.0 is a learning model developed through the R & D Analysis, Design, Development, Implementation and Evaluation research method, which was carried out at Nusaputera Vocational School with a population of 87 students. Syntax HYLED 5.0 is Determination of project questions and topics, Project planning with problem object orientation, Utilization of Technology for information gathering, Collaborative teamwork in project work using Virtual Lab, Guidance and evaluation, and Presentation using Virtual Lab. The results of the three expert validity tests were 86.3, 82.2, and 87.1 so it can be concluded that the HYLED learning model is valid and can be used as a learning model. The results of the writing skill improvement test were N-gain was 0.87. These results indicate that the HYLED 5.0 learning model is effective in improving students' English skills.

Keywords: HYLED 5.0; Hybrid Laboratory; Education 5.0; Learning Model; Writing

1. Introduction

Post-pandemic caused several new views on the education and learning system in the Society 5.0 Era. Learning has changed from being conventional and now moving to virtual and previously material in printed form can now utilize LMS [6]. Most classroom learning activity depends on the technology used in learning models or media that affects the learning quality. With this phenomenon, educators are required to have the ability to manage and maximize technology in the classroom to create competent learning. Post-pandemic learning has different demands from learning during a pandemic, it is because during the post-pandemic teachers and students can return to their activities in the classroom. Students also feel more motivated and encouraged because they experience new things compared to conventional or just online learning activities [16].

In its development learning system, online mode currently causes several problems and obstacles. Those are often faced by schools in several countries are Economic status of a country, technical skills, and Instructional strategy [5]. There are many tools that must be provided for online learning and teaching, but not all schools and countries are able to provide and distribute these facilities equally. Other difficulties and problems relate to new things such as technology consisting of internet installations, audio and video, and specifications of the tools used. Many subjects also cannot be done online or virtually because learning requires direct or physical interaction [10]. On the student side, even though online learning is interesting because students get new experiences with the virtual world, many of them feel bored because of the long duration and having to stare at the screen continuously. Students must also have an internet network and complete facilities, so this is an obstacle experienced by students during online learning [2]. This need is because online learning remains in order to increase students' potential and competence, so there are changes that must be adapted to by students and teachers.

Online learning is less effective learning in the post-pandemic period, so schools and the education system require a paradigm shift. Students find it difficult to adapt even though the pandemic has lasted for 2 years, but online learning is not something that is easy to implement, especially since schools have several activities such as providing materials, exams, seminars, practical, and so on [8]. Based on several problems, it is important to have a learning system that is able to accommodate the changes and circumstances that follow. One thing that can be a solution is Hybrid Learning.

Based on the problems and background above, this research aims to develop an innovative learning model based on the new educational era, namely Education 5.0. This research is a new topic and different from other development models, because the Hybrid Learning model is applied in the Visual Laboratory with the grand theory of Social Constructivism in English Language Learning. The research problem is how feasible the HYLED 5.0 (Hybrid Laboratory Based on Education 5.0) as Learning Model for English Writing Skill Improvement.

1. Literature Review

Language laboratory refers to a unit or room that contains equipment such as computers, audio visuals, and applications to carry out language simulations. This lab aims to improve language skills. A language laboratory is a room equipped with a tape recorder, etc. to learn foreign languages [20]. Broadly speaking, this equipment is divided into three, namely (1) main electronic devices, namely equipment that has a significant role in improving a person's ability to use language; (2) furniture and room accessories, namely all equipment that functions to provide comfort for students to study in the room; (3) multimedia equipment, namely additional equipment that can function optimally depending on the capabilities of the main device used.

Language laboratories are completed with computers, tabs, or some technologies to be able to improve and assist the language teaching and learning in school [19]. A language laboratory refers to a set of electronic audio video equipment consisting of an instructor console as the main machine, equipped with a language

learning machine repeater, tape recorder, DVD player, video monitor, headset and student's booth (student booth) which are installed in one soundproof room. Apart from that, there is a multimedia computer component as an additional component that can be combined with all of this to create a multimedia language laboratory. This means that language laboratory equipment includes various types of media with varying functions. With a multimedia language laboratory, creative educators can utilize various types of foreign language learning programs, whether packaged in the form of audio cassettes, videos or interactive CDs. In fact, with this equipment, teaching staff can also utilize their abilities in facilitating students to be actively involved in the communication process via headsets and microphones available at each student's desk. The Language Laboratory is an electronic device designed to help make the language learning process easier [1]. Apart from Listening classes which are integrated with Speaking, Reading or Writing, multimedia language laboratory equipment can also be used to broadcast lectures/learning [3]. For example, teachers can show the VCD Language Teaching Methods from Diane Larsen-Freeman; For students majoring in Literature, the films Hamlet, Shakespeare in Love, Romeo and Juliet or films about America can be presented to support the Cross Culture Understanding course. Furthermore, it is also possible that the multimedia laboratory function can also be used to display lectures/lessons in mathematics, geography, anthropology, biology, history, economics, engineering, medicine, etc. which are presented in English or other foreign languages throughout the subject matter. It is available in the form of VCD/DVD, or CD-Rom.

The Virtual Laboratory began with a project called "Essays and Resources on the Experimentalizing of Life (1830-1930)" which was located at the Max Planck Institute for the History of Science. This project aims to research the history of the experimentalization of life. The term experimentalizing describes the interaction between life sciences, art, architecture, media and technology in an experimental paradigm. In 1997, Language Laboratory is more interesting, more interactive to teach nowadays. Apart from that, through virtual laboratories, research costs can be saved, and research that was previously impossible due to system conditioning limitations can now be carried out.

The PJBL learning model uses problems as the first step in collecting and integrating new knowledge based on experience and real activities. The role of the teacher in this method is as a facilitator who provides facilities for students when asking questions about theory and provides motivation for students to be active in teaching [6, 9]. According to Mukhlis (in Trianto, 2014) the learning model used gives educators the opportunity to take full control of the ongoing teaching process. The teaching system provided includes project work in the process [6, 9]. The project-based learning teaching model is often referred to as a teaching method that uses problems in its system with the aim of making it easier for students to understand and absorb the theory provided. This model uses a contextual approach and fosters students' skills in critical thinking. So that they are able to consider the best decision taken as a solution to the problem received. Project work is often defined as work that is structured by several tasks and is based on questions and problems that require students to think critically in finding solutions. Problem-solving steps taken by students can be used as a basis for conducting assessments.

VILLE 5.0 is an innovative learning model design discovered by Dr. Tatas Transinata, S.Pd., M.Pd. through grounded theory research in 2022. This model design received IPR in 2021 and received an award from the Ministry of Education and

Culture. The components of the Online English Lab in this research consist of equipment, equipment and the nature of the media. In the following chart the researcher obtains the theory of component characteristics in the English Online Lab. These five characteristics are as follows:

1. Internet-based hardware and software devices
2. Online Interactive Learning Media
3. Skill Enhancement Media
4. Semi-Autonomous Unit
5. Ubiquity Device

Learning with a hybrid system is the main alternative for schools to continue to utilize technology and increase student interaction so that learning is efficient and in accordance with competency standards (Essa, 2023). Hybrid Learning makes it easy for teachers to carry out direct interactions by utilizing technology to provide material virtually or online [21]. The convenience of this Hybrid Learning model brings benefits and good impacts for learning, namely student-centered learning where students will be actively involved in every learning activity. The next benefit is the creation of content and learning outcomes that originate from student creativity so that students have directly visible competencies [22]. Hybrid system learning combines direct interaction with online or virtual features, so that this learning will cover the four main components of a learning situation (time, place, path and space) through a predetermined program. Learning with a Hybrid system is required for all subjects or material topics, one of which is English. The Hybrid System increases motivation and collaborative values between students in learning English [17]. Learning English requires a special approach that cannot be taught using the lecture method but requires innovation in the process. A relevant innovation is the use of a Language Laboratory. This device plays a very important role because this device provides space for students to interact, see, hear, and speak specifically and complexly about English. The use of technology in learning has received many recommendations from research results, so that the role of technology in improving English language competence is very proven and valid [12].

2. Research Methodology

Research Design

This research uses the ADDIE Research and Development (R&D) method (Analysis, Design, Development, Implementation and Evaluation) [23]. The ADDIE model design aims to produce a HYLED 5.0 (Hybrid Laboratory Based on Education 5.0) Learning Model Model to Improve Descriptive Writing Skill. The ADDIE method is very accurate and more valid in its development to create the learning model based on Education 5.0 Era. The population in this development research was class XI students at Nusaputera Vocational School, Semarang, totaling 180 students. The sample used in this research was only 2 classes with a total of 74 students. The samples were tested by Pretest and Posttest with Descriptive Writing Test.

Measurement of the feasibility level of developing a Hybrid Laboratory based on Education 5.0 using a Questionnaire Instrument. This instrument will be assessed by Learning Media Experts and Learning Material Experts. The English Descriptive Writing Skill competency test uses observation and written tests. In improving the

product quality of the HYLED 5.0 learning model, the model is tested based on product validity and effectiveness. Product validation indicators are shown in the table.

Table 1. Aspect and Indicator of Product Validation

Aspect	Indicator
Conformity	The model developed has a level of conformity with the Achievement Indicators and Basic Competencies in the Curriculum
Convenience	The level of ease of the language components used in product development has easy, medium and difficult levels of understanding
Completeness	The level of completeness in the use and selection of technology which includes applications and media such as Gadgets, YouTube, PPT, Canva, etc.
Clarity	The level of clarity in the description of the teaching model and the way the learning model is implemented

Each indicator can be said to be valid if it meets the numbers on the indicators that have been determined. The development of Hybrid Laboratory learning model based on Education 5.0 (HYLED 5.0) was developed with several measurable and tested tests and validations in each aspect. The following are the model validity criteria used:

Table 2. Criteria for the validity of the learning model that has been developed

Score Interval	Validity Criteria
$X > 85$	Very valid
$70 < X \leq 85$	Valid
$X \leq 70$	Invalid

At the testing stage, the effectiveness of the HYLED 5.0 learning model product uses analysis of the English Writing test scores. An indicator of the effectiveness and success of this learning model is that there are a minimum of 80% of students who get a minimum score of 75. On the other hand, to test the potential effect of the HYLED 5.0 learning model using the N-Gain score by calculating the difference between the post-test and pre-test scores in Writing skills.

Table 3. N-Gain Score

N-Gain Score	Category
$G > 0,7$	High
$0,3 \leq g \leq 0,7$	Medium
$g < 0,3$	Low

3. Results & Discussion

4.1 Results

Development of the HYLED 5.0 (Hybrid Laboratory based on Education 5.0) Learning Model in the form of a learning syntax using virtual Labs and direct learning activities. The syntax of the HYLED 5.0 learning model is the development of laboratory-based learning, project learning, and education 5.0. Students receive a

learning topic accompanied by a problem, then students solve the topic and problem using the project learning method, by utilizing media features and virtual labs.

a. Analysis Stage (Analyze)

The HYLED 5.0 Learning Model is aimed at students at the Vocational or High School level but it does not rule out the possibility that it can also be used at all levels of education. Schools need HYLED 5.0 due to deficiencies and gaps in problems between online and offline learning which involve a lack of adequate equipment, the absence of attractive learning models, and reduced student competence in English.

HYLED 5.0 has learning goals and outcomes, namely increasing students' reading skills. The material tested in this learning model is about Descriptive Writing. The materials and topics in this learning process are adapted to the curriculum and lesson plans created by the class teacher. Topics are taken from the school environment or issues around them so that students can participate in implementing Education 5.0-based learning. HYLED 5.0 is a learning model that is more flexible and can be applied according to existing conditions. The minimum equipment that must be met is a gadget which can be a laptop, computer, cellphone or tablet that is connected to the internet network. This standard equipment also has a weakness, namely that not all schools or students have gadgets or good internet connections.

b. Design Stage (Design)

The aim of the design stage is to design a clear and structured learning framework so as to create a more specific, measurable and targeted HYLED 5.0 learning model. HYLED 5.0 is a development of the Project based Learning on Education 5.0 assisted by Virtual Laboratory. The HYLED 5.0 learning model develops the project learning and Education 5.0 learning models which consist of:

a) Determining questions and project topics

This stage begins by providing a material topic with a question that students will answer and work on in the form of a project. The question raised could be "How to increase the tourism potential of the city of Semarang?"

b) Project planning with problem object orientation

Teachers and students together and collaboratively determine the objectives of the learning and projects being undertaken. At this stage, the steps that must be taken, time, schedule, material, ingredients, and media used, as well as the presentation model and assessment system, are also discussed.

c) Utilization of Technology for information collection

Technology plays a very important role in the HYLED 5.0 learning model as a tool and also a medium for collecting and packaging information globally and in-depth. Students can use their gadgets, such as cell phones, laptops, tablets, or class computers. Teachers can recommend search engines used in this learning model, such as Google, YouTube, social media, or blogs. The technology used in this learning model aims to enable students to gain more and more effective findings.

d) Collaborative teamwork in project work using Virtual Lab

Students work on this project by collaborating and collaborating with friends or teams that have been formed together. This project is carried out by utilizing virtual media such as discussions using Zoom, making posters or videos using Canva, or making animations using applications mastered by students.

e) Guidance and evaluation

To overcome existing problems and obstacles, the teacher provides guidance during the project process, helps students overcome obstacles, and provides feedback. After being given guidance and correction, students can also make revisions to their work based on feedback from teachers and classmates.

f) Presentation using the Virtual Lab

The final stage is for students to present the results of their work to the class and teacher either in front of the class or via virtual media so that this presentation can be recorded and made into a virtual presentation to be documented. At this stage, students will also receive assessments and comments from teachers or classmates with the aim of getting better results.

c. Development Stage (Development)

The development stage is the stage of individual testing and validation by experts or design experts. This expert test was carried out by 3 lecturers, namely the learning model lecturer from Sebelas Maret University, the Education Technology lecturer from PGRI Madiun University, and the English language lecturer from Ngudi Waluyo University. Meanwhile, small group trials were carried out on 10 students at SMK Perdana Semarang majoring in ICT. The purpose of evaluation and revision is to get good final results and can improve student competence when used in the learning process. The results obtained in the validation from the three experts' scores are 86.3; 82.2; 87.1 based on the score concludes that Hyled 5.0 Learning Model Product is valid and suitable for use as an Education 5.0 based Learning Model.

1) Product Revision

The assessment of the three experts concluded that the Hyled 5.0 Learning Model was valid, however there were still improvements that needed to be made to make this learning model better. Revisions that must be made include adjusting the level of material, clarifying the accuracy of the technology used, and simplifying the language for learning operations.

2) Product Effectiveness

The effectiveness of Hyled 5.0 learning model was measured using a pretest and posttest which were tested on 38 class XI vocational school students majoring in ICT in the English course. Students are asked to create descriptive writing about the tourism potential and natural riches that exist in the Semarang area by collaborating. The scores obtained are presented in the table below

Table 5. Student Writing Pretest & Posttest Score

Student Writing Score		
Pretest Score Average	Posttest Score Average	N-Gain

37	87.5	0,87
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Based on the table above, the average pretest score is 37 at the start of Descriptive Writing. Then, after students received learning using the HYLED 5.0 model, the student's Descriptive Writing posttest score rose to 87.5. This means an increase in students' grades and competence in the learning process with the HYLED 5.0 model. The N-Gain score obtained reached 0.87, meaning that the HYLED 5.0 Learning Model is included in the high category. After obtaining these figures HYLED 5.0 is in the high category, so it can be concluded that HYLED 5.0 is effective to use.

4.2 Discussion

HYLED 5.0 is a learning model developed from the Project Learning learning model where this model emphasizes constructive and collaborative problem solving. Project based learning has a weakness in that there is no integration or use of technology in the learning process so that development is needed to adapt to current learning trends and topics. The development model used is to develop Project learning by integrating Virtual Laboratory and Education 5.0 to create a Hybrid Laboratory learning model based on Education 5.0. Hybrid Laboratory is a learning process space that not only contains laboratory equipment but media that can accommodate online and offline learning processes. Students and teachers can not only connect directly or offline but can also interact online and search for complete information.

HYLED 5.0 begins by providing the main problems or material that will be discussed. This learning material is obtained based on the curriculum or learning outcomes, while the problems are obtained from issues or problems that are currently developing in the surrounding environment. The problem formulation in this learning practice is about tourism potential and areas in Semarang. The second step is project planning by providing problem object orientation. In this session the teacher shows and explains what potential exists in Semarang through gadgets and sharing videos in class. Students observe and record all the findings in the video. This is a problem and potential orientation so that students can understand the object of the problem well.

Students then plan what steps must be taken, including forming a team consisting of 5 students per team, the equipment used is a laptop, an application using Canva, a search engine using Google, and the final presentation results using PPT. This project is carried out for 2x45 minutes offline with a division of work, namely chairman, secretary, designer and presenter. Students write descriptions of problem findings very well because they are assisted by applications and virtual media. When students start the process of working on a project, the teacher provides assistance and correction. After the teacher carries out a direct evaluation and is revised by the students, the students prepare to make presentations using their respective media and applications. The teacher assesses the students' writing results carefully.

The HYLED 5.0 learning model process provides students with a different experience, where students have the freedom to search for information in an interesting way because it is integrated with technology. This is different from conventional learning where students only receive limited information through books or teacher explanations. Another advantage is that the products produced by students are very varied and have high value because students can develop them using gadgets and assisted applications. Another interesting thing about this learning model is that there is team collaboration which can be done both offline and online. On the other hand, this

learning model has a drawback, namely that students will become dependent because all searches use the help of tools or gadgets. To overcome this, teachers should be able to limit the use of gadgets and applications so that students are also accustomed to searching for information conventionally.

HYLED 5.0 is a modern learning model based on Education 5.0 which emphasizes collaboration and constructiveness from students as actors of learning. HYLED 5.0 received a good learning model validity score so that this learning model is very suitable and effectively used in 21st century learning. This learning model is also included in the high category which is effective in improving English language competence as proven by the pretest and posttest and the N-Gain score on Writing test. This improvement means that HYLED 5.0 can be applied to vocational school students or other levels of education because of its ease, effectiveness, and validity as a learning model based on Education 5.0.

4. Conclusion

The HYLED 5.0 Learning Model is a learning model developed using the ADDIE R&D research method. The analysis of this learning model is the lack of effectiveness of conventional learning which has not been integrated with technology. The Hybrid Laboratory development model based on Education 5.0 is a development based on Education 5.0 by utilizing technology and applications to improve learning skills and competencies. The results obtained from product validation are 86.3, 82.2, and 87.1 so that this learning model product is valid and can be used. Meanwhile, in the effectiveness test, the pretest results were 37, the posttest was 87.5, and the N-gain was 0.87. These results indicate that the HYLED 5.0 learning model is effective in improving students' English skills.

With this research and learning model, it is hoped that teachers can further increase their creativity in teaching by utilizing technology that can solve social problems. Teachers do not only focus on conveying material but must also be able to improve students' English skills or competencies so that learning objectives can be achieved well. HYLED 5.0 is a solution that teachers can use to manage learning in the classroom by opening horizons and increasing student learning motivation in the classroom with interesting learning features and variations.

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