E-Learning Learning Management Development at Joseph Yeemye Foundation School, North Sulawesi

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Abstract: The development of learning management in the industrial era 4.0 is urgent. Education management designs are needed that are updated and adapted to managerial duties and functions, whether as Supervisors, Foundations, Principals, Deputy Principals, Teachers or IT coordinators so that they are not eroded by the times. In the context of the North Sulawesi Joseph Yeemye Foundation schooling, e-learning earning management began to be developed as one of its advantages. In a managerial context, the management that has been built has not found a learning management development model along with its level of effectiveness. This study aims to describe and analyze how the e-learning management development model and its level of effectiveness can improve student learning outcomes. Products are needed to prove and appropriate products after going through an environmental analysis, potentials and problems, namely E-school. This study combines qualitative and quantitative research methods and uses the ADDIE development model. The results of the research by testing the validity of the test in the form of multiple choice items show the standard deviation at 3.53 with the correlation of variables 1 and 2. The reliability test using the Flanagan equation is at 0.35. This means that there is a positive correlation or relationship between e-learning learning that is integrated in E-school products and student learning outcomes.

Keywords: Management, E-learning, E-school, North Sulawesi Joseph Yeemye Foundation.

Background of the problem

Referring to the Merdeka curriculum which is associated with the industrial era 4.0, the world of education seeks to utilize e-learning integrated learning. The reality on the ground is that there are still many schools that have not utilized e-learning to support the learning process in the classroom. In 2022 North Sulawesi Province, recorded at the Central Statistics Agency for North Sulawesi Province as having 230 high schools with details of 121 public schools and 109 private schools. Reading literacy activities according to data released by the Center for Research on Cultural Education Policy and the Ministry of Education and Culture in 2019 placed Sulawesi Province North is at 40.20 (moderate category) or 9th in Indonesia. The index distribution is as follows: North Sulawesi skills index is at 80.35 (very high), Access dimension, 22.61 (low), Alternative dimension 40.42 (moderate) and cultural dimension 33.82 (low). That is, the literacy level in North Sulawesi is in the medium category.

One strategy to improve student learning outcomes is through the development of e-learning learning management. The facts at the research site show that schools that are members of the North Sulawesi Joseph Yeemye Foundation have the potential to develop e-learning based learning. There are ten schools under the auspices of the North Sulawesi Joseph Yeemye Foundation, starting from the most basic level, namely kindergarten to middle and vocational schools. These schools have their respective authorities in managing management, more specifically the development of e-learning based learning. However, in reality the schools that are members of it do not yet have a development model that can be used as a reference for foundations, principals, teachers and students.

Previous research has talked a lot about e-learning management, but specifically paying attention to the development of e-learning management using R&D methods has not been much, moreover the research locus at the Joseph Yeemye Foundation School of North Sulawesi has never been researched.

Based on the background above, according to researchers, learning management is needed in an effort to integrate e-learning. The question is how is the e-learning learning management model appropriate and can improve learning outcomes at the Joseph Yeemye North Sulawesi Foundation School? How to improve student learning outcomes at the Joseph Yeemye Foundation school in North Sulawesi in particular so that they are able to compete and be ready to face the industrial era 4.0? What is the level of effectiveness of the e-learning learning management model that is integrated into E-school products at the Joseph Yeemye Foundation School, North Sulawesi? Based on the background that has been described, the researcher chose the title "Development of E-Learning Learning Management in North Sulawesi Joseph Foundation Schools."

Literature Review, Theoretical Studies and Thinking Framework

Ariani (2018) says that e-learning requires design development, population characteristics. That is, planning management must be considered before proceeding to the organizing or leadership and evaluation stages. Hamdan and Wiryanto (2018) agree with Ariani that e-learning learning management can improve student learning outcomes. In the same year Hamdan and Wiryanto (2018) conducted research with a focus on testing the extent to which learning management models were effective.

Hapsari, Wibawanto and Sudana (2017) stated that the development of mobile learning using digital techniques functions effectively as a learning medium. Their research is entitled Development of Digital Engineering Mobile Learning for Electrical Engineering Education Students.

According to G.R. Terry (in Syahrizal Abbas, 2009:65) planning has the meaning of describing or using a number of assumptions about the vision of the future through the formulation of the activities needed to achieve the expected results. Meanwhile, according to Louis A. Allen (in Syahrizal Abbas, 2009:97) planning is a series of activities to achieve results. From this definition it can be concluded that planning is the process of planning policies, objectives or procedures that are expected or desired to be carried out in the future through a program that has been prepared.

Sobri in Ihsana (2017: 18-19) says that there are eight principles of learning, namely: first basic experience, secondly clear and directed goals, thirdly problematic situations, fourthly determination and ability that is hard and not easily discouraged, fifthly guidance, encouragement and directions, the six exercises, the seven proper methods and the eight proper times and places. The goal is that students have the expertise in solving the problems needed because humans are social beings who live together with other people and are not individualistic.

A. Learning Process

The learning process is the interaction that occurs between stimulus and response. So without a stimulus there will be no response. Without a response, the learning process will not grow and develop. Slameto (2015: 2) says that learning is a process that occurs in the learning process to change behavior as a whole. According to Skinner in Dimyati and Mudjiono (2025:10) learning is to change behavior. When the response becomes good there will be a change in behavior. According to Ihsana (2017: 4) learning is an activity because there is a process with the aim of obtaining maximum results. According to Syaiful and Aswan (2014: 5) learning is a change in behavior thanks to experience and practice. This means that learning is a change in behavior both knowledge, skills and attitudes. Likewise, Tirtarhardja and Sulo (2015: 129) say that learning is a process for changing behavior because of individual interactions with the environment. Sary (2015: 180) says that the learning process is a change in behavior based on experience that is permanent.

B. E-Learning Learning Management

Management can be interpreted as leading, managing, managing, controlling. The notion of management also means the art or science of managing educational resources to achieve educational goals both effectively and efficiently. Management functions include planning, organizing, leadership, controlling.

E-learning learning is learning that integrates learning components systematically across space and time. E-learning is a tool and not the main thing. The main roles in e-learning are students and teachers acting as tutors. E-learning is an abbreviation of electronic learning. E-learning technology is bridged by the internet with media to be able to display material, questions or communication facilities so that information can be exchanged between students and teachers. Here are some opinions related to the definition of e-learning.

According to Csete and Evans (2013) e-learning consists of planning and is supported by careful management. Trials, evaluation and reporting are needed as well as the availability of professional, technical and instructional design support as factors that can influence the success of e-learning. Lengkong (2013) in his research stated that instructional leadership is one of the factors that determine school effectiveness so that there is a shift towards a new perspective called learning-centered leadership. Rawis (2021) in research on the use of information technology emphasizes the management of school principals as supervisors and must be supported by teachers to utilize ICT in learning.

Based on the definition of e-learning, it can be concluded that e-learning is learning using internet technology to assist the learning process between teachers and students. E-learning is a medium for conveying information, communication, online education training that is connected to the internet.

C. E-Learning Learning Model

Onno W. Purbo (2002) emphasizes three conditions that can be met to design e-learning learning, namely simple, fast and personal. Simple is related to the ease with which students can use technology and existing menus and panels so that they can reduce the introduction of the system itself. The interaction between students and educators takes place in two directions, namely carried out synchronously and asynchronously. Synchronous is carried out directly, namely the teacher conveys the lesson and the students listen. Asynchronous, namely learning carried out indirectly.

D. Learning Outcomes

Sudjana (in Sutrisno, 2021:22) says that learning outcomes are a process in the form of planned tests in the form of written, oral and action tests. According to Suprijono (in Thobroni & Mustofa, 2011:22) learning

outcomes are values, patterns of behavior, attitudes, appreciation, understanding and skills. Rusman (2017: 129) adds that learning outcomes are a number of experiences students gain through the psychomotor, affective and cognitive domains. So, learning outcomes are the results obtained by students through learning tests on certain materials. Learning outcomes are used as a measure of the extent to which students understand the material.

E. Definition of E-school

E-school is a complete web-based application (enterprise) for school administration management such as admitting new students, student data collection, teachers, subjects, schedules, operational teaching and learning activities, e-learning modules, financial management to reporting.

The E-school application is developed using web-based technology, java programming with the ZK & Bibernate framework, multi-OS support for both server and client (can use any operating system be it windows, linux, max, etc.), multi-database support for servers (default PostgreSQL). , supports multi browsers (prefer mozilla fire fox/google chrome/IE), no need for installation on the client side, client computers only need a browser.

ADDIE E-learning Management Development Scheme
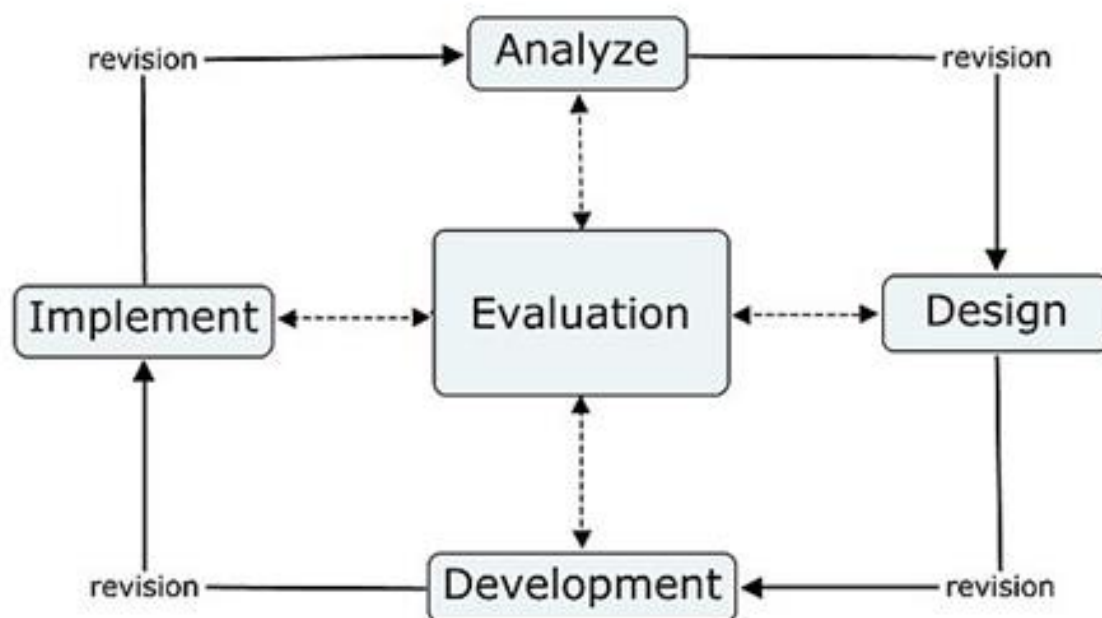
Research Methods

A. Development Framework
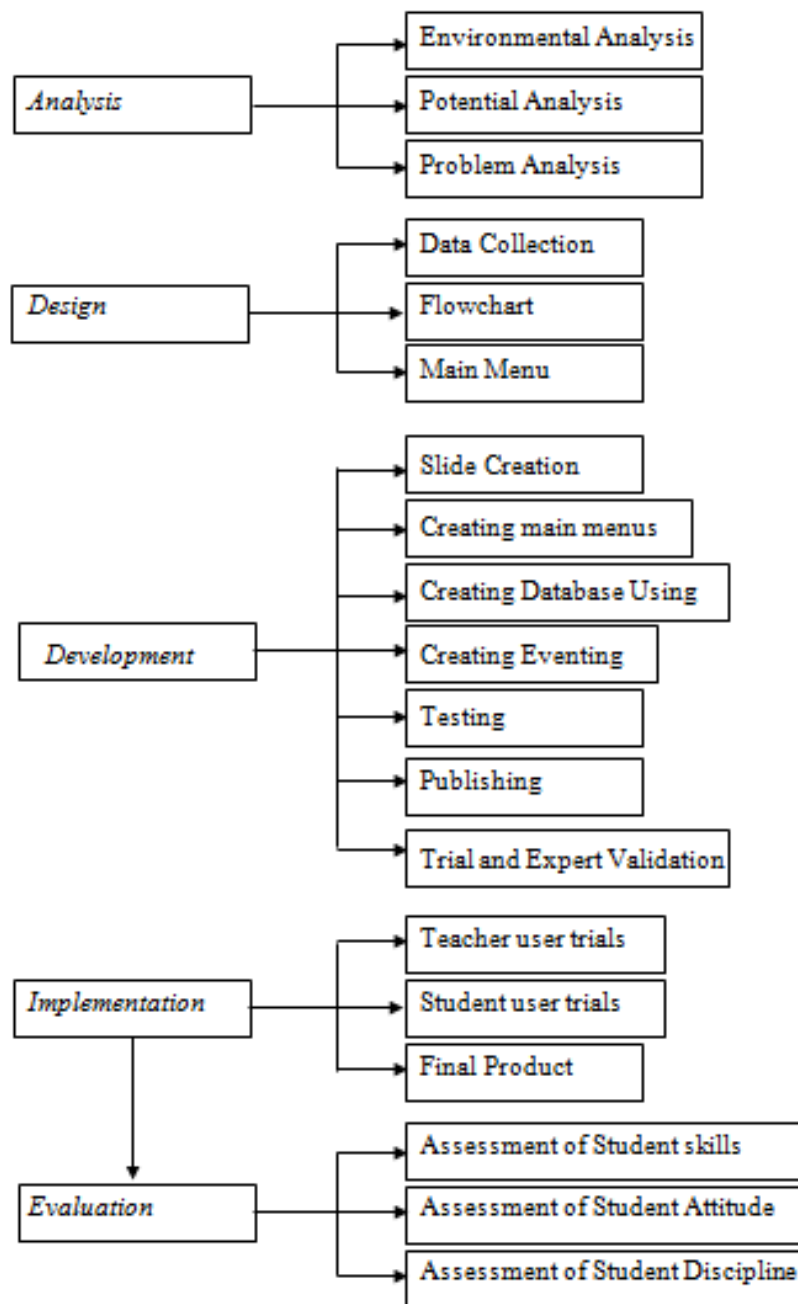
The method used in this research is Research and Development (R&D). The main goal is to improve existing products or develop products based on testing so that these products can be accounted for (Ali Maksum, 2012: 79). The product in question is defined as hardware (hardware) and software (software) as found in interactive learning models using information technology.

This research is an educational research and development (educational development research). The stages or process of R&D research in this study include product validation and product trials. According to Sugiyono (2015: 407) development research produces products or tests product effectiveness.

The following are the stages of the ADDIE development procedure starting from:

1. Stage of Analysis (Analysis). The products produced through this research are eschool products. This stage analyzes the potential and problems of education in the Joseph Yeemye Foundation school environment.

2. Stage Design (Design). This stage makes it easier for researchers to use eschool applications. Design criteria consist of data collection, flowchart and main menu.

3. Development Stage (Development). The development stage is the stage of design realization so that it becomes a product. The product produced at this stage is tested. At this stage the researcher develops an application according to the design that has been made which consists of making slides, making mapping, making using databases, publishing, testing and expert validation.

4. Implementation (Implementation). At this stage, product trials are carried out. Trials were carried out on teachers and students so as to obtain the final product.

5. The Evaluation Stage consists of assessing the skills, attitudes and discipline of students.

B. Research Subjects and Objects

Place and time of research. This research was conducted in Rex Mundi High School, Familia Vocational School, Pax Christi Junior High School, Stella Maris Junior High School, Sta. Theresia 01 Elementary School, Sta. Theresia 02 Elementary School, Sta. Theresia 10 Elementary School. The research time is 5 months starting from March – July 2022 which consists of 5 stages or steps of R&D research methods.

C. Data Analysis Techniques

According to Akbar (2013: 158) the formula for analyzing the level of validation is descriptive as follows:

$$Va1 = \frac{TSe}{TSh} x\ 100\%$$

$$Va2 = \frac{TSe}{TSh} x\ 100\%$$

$$Va3 = \frac{TSe}{TSh} x\ 100\%$$

$$Va4 = \frac{TSe}{TSh} x\ 100\%$$

$$Va5 = \frac{TSe}{TSh} x\ 100\%$$

So that after the value of each validation test is known, the researcher can calculate the combined validity of the results using the following formula:

$$V = \frac{Va1 + Va2 + Va3 + Va4 + Va5}{5} = \cdots \%$$

After the average results are known, then to determine the criteria for the validity level, look at the following table:

Table 1: Validity Criteria according to Validator Assessment

No	Validity Criteria	Validity Level
1	85,01% - 100% (A)	Very Valid, or can be used without revision
2	70,01% - 85% (B)	Valid enough, or can be used but needs minor revision
3	50,01% - 70% (C)	Invalid, it is recommended not to use it because it needs major revisions
4	01,00% - 50% (D)	Invalid, or may not be used

Source: Akbar (*(2013:155)*

The device assessment instrument is considered valid if the average validation rating is categorized as valid or very valid.

D. Test Validity Test

The formula used is based on the Test Item Validity Testing Technique (Sudaryono: 2021).

$$rpbi = \frac{Mp - Mt}{SDt}$$

Information:

rpbi = Biserial point correlation coefficient which represents the strength of the correlation between variable I and variable II which in this case is considered as the item validity coefficient.

Mp = The calculated average score is owned by respondents who have answered the items in question very well and well.

Mt = Average score of the total score

SDt = Standard deviation of the total score

P = The proportion of respondents who answered very well and well to the item being tested for the validity of the item.

q = The proportion of respondents who answered quite well and not well enough for the item being tested for the validity of the item.

Step 1: Prepare a calculation table in order to analyze the validity of items number 1 to number 13.

Step 2 : Finding the mean of the total score, by using the formula:

$$Mt = \frac{\sum Xt}{N}$$

Step 3 : Finding the total standard deviation, by using the formula:

$$SDt = \frac{\sqrt{\sum X_t^2}}{N} - \left(\frac{\sum Xt}{N}\right)^2$$

Step 4 : Look for (count) for item number 1 to number 13 which is to summarize the conversation.

Step 5: Find (calculate) the correlation coefficient r from items number 1 to number 13 using the formula:

$$rpbi = \frac{Mp - Mt}{SDt}$$

E. Population and Sample

1. Population

Table 2: Study Population

No	School Names	Total Number of Teachers (N)	Number of students in grades 12 and 9 (N)
1	Rex Mundi High School	40	219
2	Familia Vocational School	27	102
3	Pax Christi Junior High School	27	155
4	Stella Maris Junior High School	30	174
5	Sta. Theresia 01 Elementary School	10	
6	Sta. Theresia 02 Elementary School	11	
7	Sta. Theresia 10 Elementary School	14	
8	Sta. Clara Elementary School	22	
	Total	181	650

2. Research Samples

The formula used by researchers to determine sample size is the Isaac and Michael formula as shown below:

$$s = \frac{\lambda^2.N.P.Q}{d^2(N-1) + \lambda^2.P.Q}$$

$\lambda 2$ with   dk = 1, 5% error rate

P = Q = 0.5   d = 0.05.   s = number of samples

Information

s = Number of samples

$\lambda 2$ = Chi Square whose value depends on the degree of freedom and error rate. For Degrees of Freedom 1 and 5% error the value of Chi Quadra = 3.841.

N = Total Population.

P = Correct probability (0.5)

Q = Probability of being wrong (0.5)

D = Difference between the sample average and the population average. 0.5% difference.

(Sugiyono: 2019: 148)

Table 3: Research Population

No	School Names	Number of students in grades 12 and 9 (N)	Sample (N)
1	Rex Mundi High School	219	219 x 650 x 242 = 81
2	Familia Vocational School	102	102 x 650 x 242 = 38
3	Pax Christi Junior High School	155	155 x 650 x 242 = 58
4	Stella Maris Junior High School	174	174 x 650 x 242 = 65
	Total	650	242

Table 4: Teacher Research Population

No	School Names	Total Number of Teachers (N)	Number of Samples (N)
1	Rex Mundi High School	40	40/181x123 = 27
2	Familia Vocational School	27	27/181x123 = 18
3	Pax Christi Junior High School	27	27/181x123 = 18
4	Stella Maris Junior High School	30	30/181x123 = 20
5	Sta. Theresia 01 Elementary School	10	10/181x123 = 7
6	Sta. Theresia 02 Elementary School	11	11/181x123 = 8
7	Sta. Theresia 10 Elementary School	14	14/181x123 = 10
8	Sta. Clara Elementary School	22	22/181x123 = 15
	Total	181	123

F. Hypothesis

Based on the theoretical review and frame of mind, the hypotheses in this development research are: The E-learning learning model that is integrated into Eschool has a positive effect on improving learning outcomes and students' attitudes at the Joseph Yeemye Foundation schools, North Sulawesi.

Research Results and Discussion

Based on simple calculations, the average value of the overall potency is 86.5%. This means that the value is high enough as a result of research to see what potential needs to be developed with a particular product. This potential value is in accordance with the existence of schools under the auspices of the Joseph Yeemye Foundation. Four important things that become the potential of the school are locus, history, achievement and foundation control.

The problems found (three problems) are new things found, namely honesty (45%), student character (43%) and learning (42%). This problem is quite high considering that the learning process is carried out by each teacher in accordance with their respective main tasks. This new discovery is called feasible, meaning that this problem can be solved by developing products that can be worked on by human resources and the assistance of other existing resources (Sugiyono: 2019).

a. Design: Product Design as needed.

In the learning management design, researchers distributed 40 questionnaires and the results were 99% of respondents agreed with the e-school learning management design. This means that the respondents are very enthusiastic about waiting for the presence of the e-school. The findings at this stage were that as

many as 99% of respondents agreed with the eschool learning management plan and then the design grid received approval from 100% of the respondents.

b. Development: Manufacturing and Testing

The process of making the result is that 80% of the components stated that e-school products were accepted because they fulfilled the elements of suitability of content, use of language, attractiveness of physical appearance and interrelationships between elements. Furthermore, e-school products are assessed by experts based on published books.

Testing. Product testing goes through two cycles. The first test of cycle 1 was carried out for Economics subjects. The average score obtained from student learning outcomes before using e-school products was 73. For history subjects 76 and informatics subjects 71. In cycle 2 the data showed an increase in student learning outcomes. The average score for Economics is 80, History is 85 and Informatics is 86. Significant increases in value are confirmed by the Principal, Deputy Head of School for Infrastructure and e-school Foundation Managers as well as each school unit.

c. Implementation: Using the Product

Implementation: Using the Product. Of the 100 respondents, 79% stated that e-schools are very helpful because they can be accessed anytime and anywhere. The material and language used is easy to understand and according to the standard language, the score is the same, namely 78%.

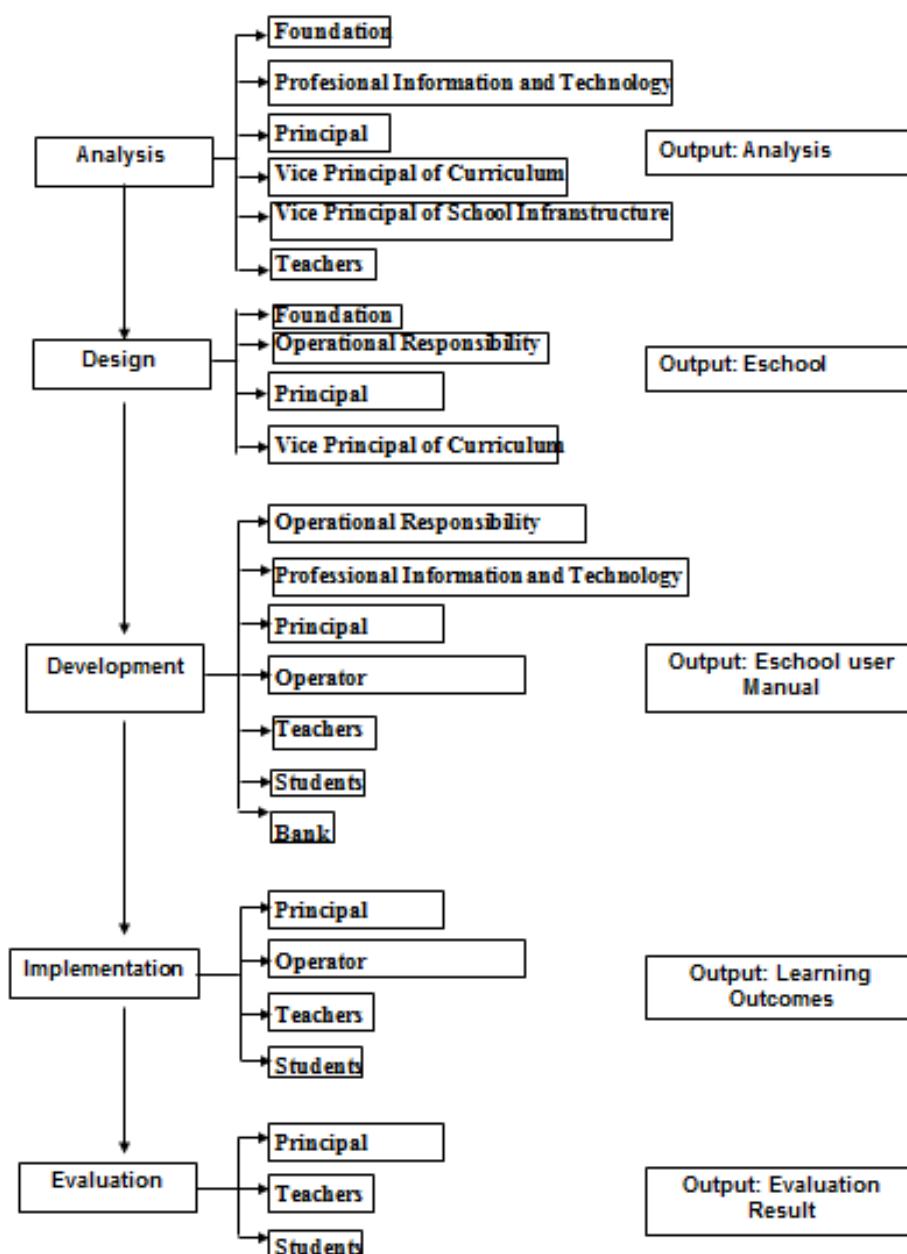d. Evaluation: Assess whether the product meets specifications

Through the use of e-school students become highly skilled and experience significant improvements in several aspects such as skills, discipline and independence. This is evident in the very good category assessment. For the assessment of skills in the "very skilled" category, the discipline of students "always" enters class on time, is orderly in uniform and attends learning, does assignments, uses, operates, downloads material already contained in eschool using existing infrastructure such as Mobile, laptop or tablet.

Conclusion

A. Elearning Learning Management Development Model

Based on the analysis of the environment, potentials and problems, an e-learning learning management product design that is integrated in the E-school is created. The management steps are as shown in the picture:

At the environmental analysis stage, the potential and problems involve a team consisting of the Foundation, the Person in Charge of the Foundation's IT Sector, the School Principal, the IT Coordinator, the Deputy Principal for Curriculum Field, the Deputy Head of School of Facilities and Infrastructure and teachers. The design stage involved the foundation, the foundation's IT person in charge, the school principal and the deputy head of curriculum. The Product Manufacturing and Testing stage involves the IT Foundation Person in Charge, IT experts, School Principals, Admins/Operators, Teachers and Students. The Implementation Stage involves the Principal, admin/operators, Teachers and students. The Evaluation Phase involves the Principal, admin/operators, teachers, students and parents.

Stages of Analysis, the Foundation as the supervisor, mentor and supervisor together with the person in charge of the IT Foundation plays an important role in analyzing using the SWOT Analysis and the results

of the analysis are submitted to the Principal as the leader and processed together with the deputy head of curriculum, infrastructure and teachers.

At the Product Design stage, it becomes the main task of the IT Foundation Responsible Person and coordinates with the school principal and the results are submitted to the Foundation. The Deputy Head of Curriculum plays a role in providing input to those in charge of the Foundation's IT features that support the product after going through observations at their respective schools. The result of this stage is an e-school product.

The next stage is the manufacture and testing of products and those who are fully responsible are IT experts for product validation, those in charge of IT Foundations, school principals, admins/operators, teachers, students and external parties, namely banks for finance. IT experts provide an assessment of the product to be developed. After going through the expert validation process and followed by product revisions, the next step is to try out the product. Product use trials involve teachers and students to see the suitability between the results of expert validation and the effectiveness of their use. The results at this stage are in the form of a guidebook for using eschool.

At the Implementation stage, the teachers, students and school administrators/operators are fully responsible after going through the principal's approval. The teacher makes lesson plans, assessments of learning outcomes and is involved in the teaching and learning process. The first cycle before using eschool products and the second cycle after using the product. The output at this stage is student learning outcomes. Responsibilities at the evaluation stage are teachers and students. The output at this stage is in the form of evaluation results.

The e-learning learning management development model at the North Sulawesi Yoseph Yeemye Foundation School is shown in the following figure:

Image: Elearning Learning Management Development Model
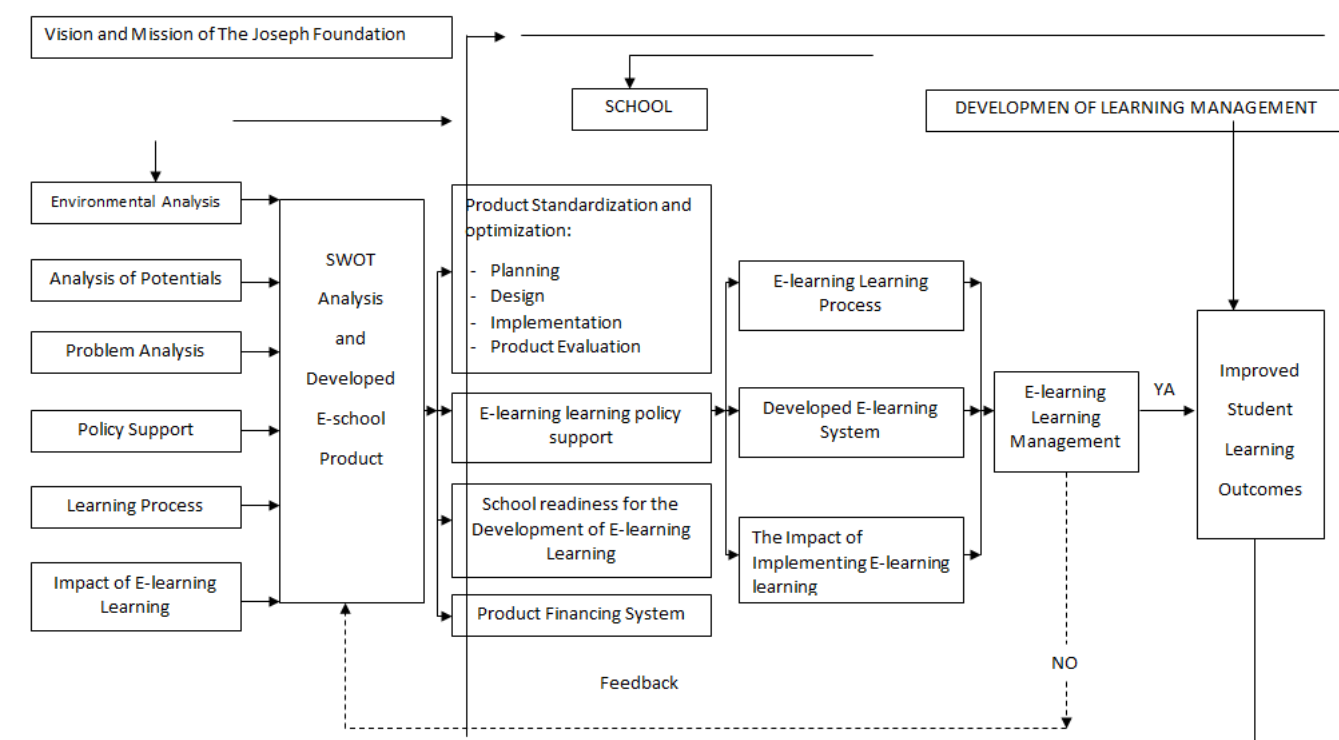
A. Increasing Student Learning Outcomes

Based on the analysis it was found that the North Sulawesi Joseph Yeemye Foundation school has the ability in terms of potential for the development of integrated e-learning learning in eschool products. In improving student learning outcomes, both the Foundation and school units realize that e-school products are very important to implement considering competition between schools and maintaining school quality.

B. Effectiveness of Elearning Learning

The effectiveness of e-learning learning can be identified through several supporting elements that influence management, namely: 1) policy support from the Foundation, 2) schools as formal institutions which consist of principals, vice principals, teachers and students, 3) readiness analysis implementation of e-learning learning that plays an active role, namely teachers, students and parents regarding product understanding and operation. 4) supporting infrastructure such as computer servers, wifi, databases, programmers and operators, LAN, switches, WAN, software along with costs and maintenance. 5) learning processes related to elearning and products to be developed such as learning models, online learning processes both inside and outside of school, 6) elearning learning systems such as control by IT staff and school admins, 7) the impact of the learning process using eschool products on improving results student learning, including the development of cognitive, affective and psychomotor aspects.

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