

# Smart School for Senior High School

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**Abstract.** Indonesia is a developing country that has used many benefits from various technology to develop various factors of such countries like an economy, education, tourism and others. In this era of information technology is the most dominant sector for society, manual activities in the past have changed with the utilization of information technology both communication, economy, and education. The education world is the beginning of learning for the children nation to advance their homeland. Every school in Indonesia must have been utilizing school based on digital technology that we can adjust to technological developments, it can make Indonesia become a developed country and can compete with other developed countries. Therefore the utilization of information technology is very important to form a creative personality and generate ideas with use technology. The wider insight of technology, more creative ideas are generated. This can give birth to younger smart generation to advanced Indonesia.

## 1. Introduction

Today many educational organizations are beginning to recognize the importance of electronic learning (e-learning) and begin to apply this approach to academic class systems [1]. The e-learning system is a modern educational system that focuses on strategies to improve the learning process [2-3]. Thikomirov et al explain that there are three that form the basis of the application of the concept of intelligent education that is the output of the ongoing education, Information and Communication Technology, and organization [4]. Meanwhile, according to Noh and Ju aspects that support the concept of "Smart Education" realization is technology, infrastructure and teacher preparation [5]. Jang explained about the current education that applies information and communication technology to the system so that it can change the educational content of teaching and learning methods, educational environment, teacher and school roles. This is because smart education is a creativity that focuses on developing new ways to learn by using technology, enabling students to learn about material anytime and anywhere [6].

Pi explained that with the existence of technology that is a smart device there is no time and space constraint to learn, and can help the student to strengthen its ability and can grow creative human resource [7].

Research conducted by Jo et al to four elementary schools in South Korea found that four elementary schools in South Korea have used an education system that utilizes Information and Communication Technology by developing Integrated Plug-in, Integrated Learning and Learning System that provides instructors, students, and parents with real-time monitoring systems, intelligent guidance systems, collaborative education mechanisms, e-Portfolio systems, and digital material production methods [8].

Likewise in India, the educational system began to develop following the development of technology. Education in India began implementing online classroom systems of online learning materials, online video conferences, and application of Android-based applications for attendance management systems



that will store student attendance status with notices to students if they are on the attendance tolerance threshold [9]. Tian and Zheng explained that in Yunnan a smart educational system has been proposed.

These systems include the development of a systematic framework of intelligent education, enhancement of intelligent educational infrastructure, intelligent city systems with unlimited access, development of smart implementation areas or educational demonstrations, and the establishment of cohesive forces that support the development of intelligent education [10].

Previous studies of the implementation of smart school systems in some countries in Asia have explained how important the application of information technology in the education system because it can facilitate to overcome the limitations on the traditional education system. However, the application of the majority Smart School education system began to be applied only at the university level, while in Indonesia many people choose not to continue their education and choose to start work, so the application of education systems with information technology should begin to be applied in ladder high school education. Therefore, the purpose of this research is to build smart school administration system that can assist in overcoming the limitations of resources in the school and to form a creative personality that generates ideas using technology. The wider technological insight, the more creative ideas are generated, which can create Indonesia's advance young generations.

## 2. Method

The method used in this paper was a descriptive method, which is a method that focuses on ongoing problem solving, using data collection techniques with questionnaires on high school students and equal to know their attitude if the school uses smart school education system.

## 3. Results and Discussion

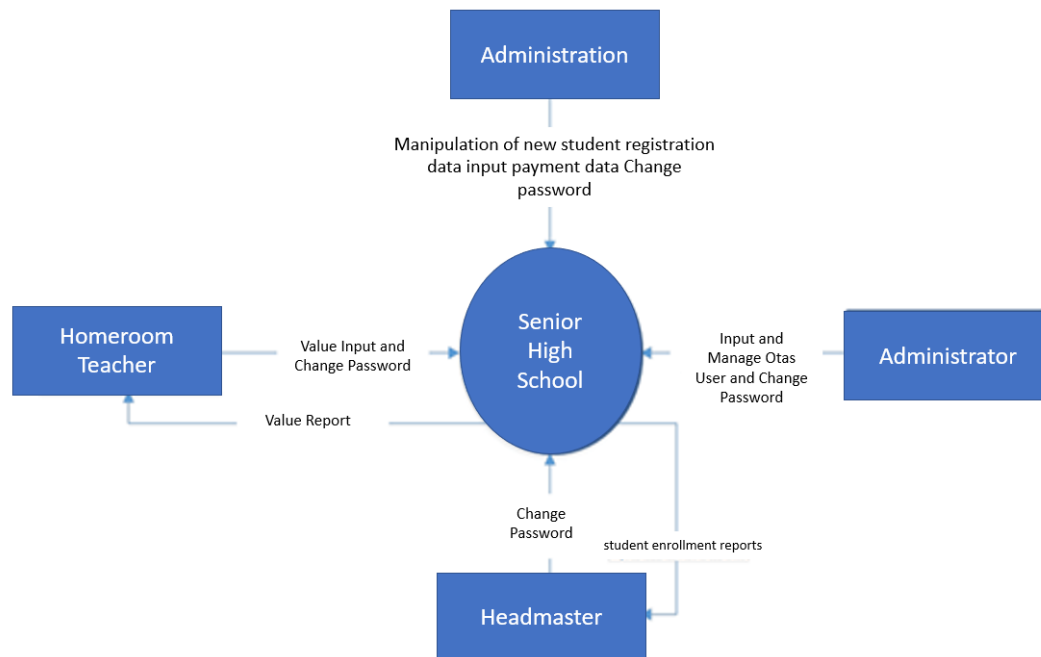
### 3.1. Smart School Development Goals

The purpose of Smart School Development is to direct students to the skills they have in more depth since sitting in the 10th or first grade of SMA along with the discussion on the development of IT-based education system or Smart School (See Table 1).

**Table 1.** System Evaluation

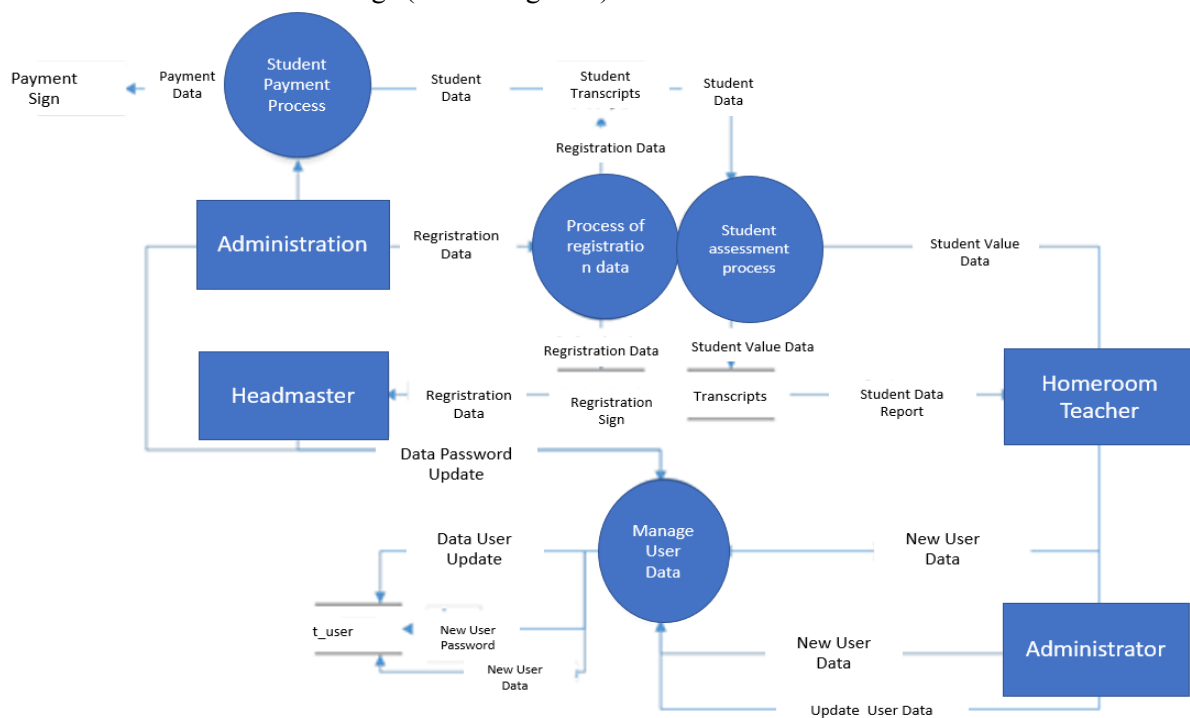
No.	Problems	Proposed Improvement
1	Many students do not even know how to convey their aspirations to the college.	The student aspiration portal allows students to easily convey their aspirations to the colleges.
2	Many students feel hesitant after giving their aspirations because students do not know whether their aspirations are responded or not.	The creation of a student aspiration portal website requires the college to respond to every aspiration proposed.
3	The process of conveying the aspirations to those aspirations is responded to still takes a long time.	This student aspiration portal information system is based on a website so it can run effectively and efficiently.

Smart School Design Process, this step describes the Context Diagram first to know the whole system from the data stream, the storage flow control and the end that is named represent the system. (See the figure 1).



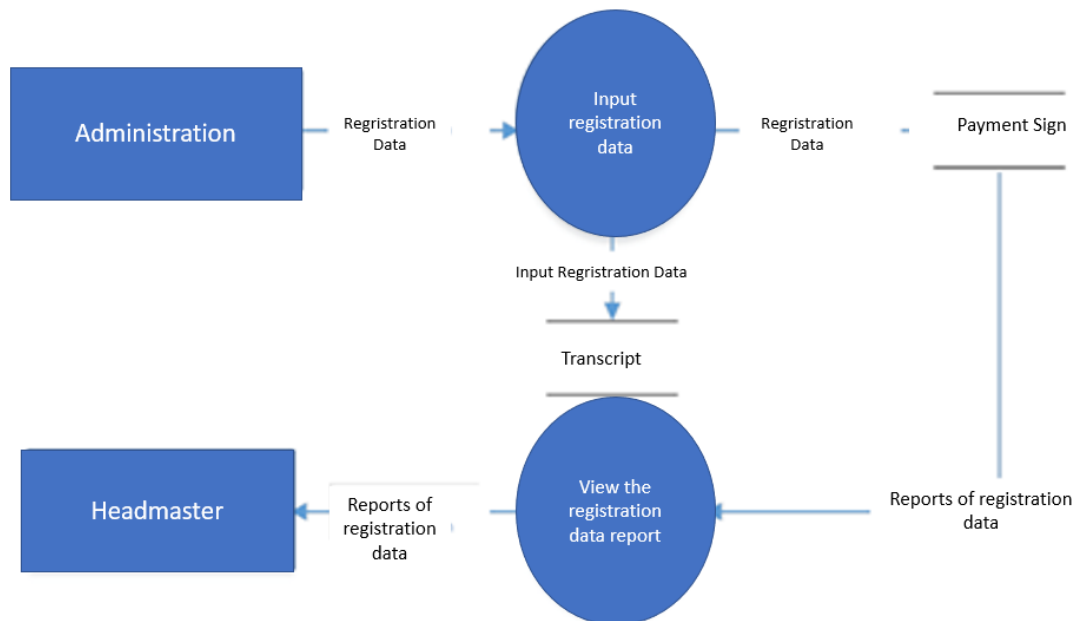
**Figure 1.** Context Diagram

After describing the context diagram of the Smart School learning system, then make the model describing the system as a network of functional processes connected to each other by the data flow, either manually or computerized by creating a Data Flow Diagram (DFD) level 1 for the system administration and student ratings (See the figure 2).



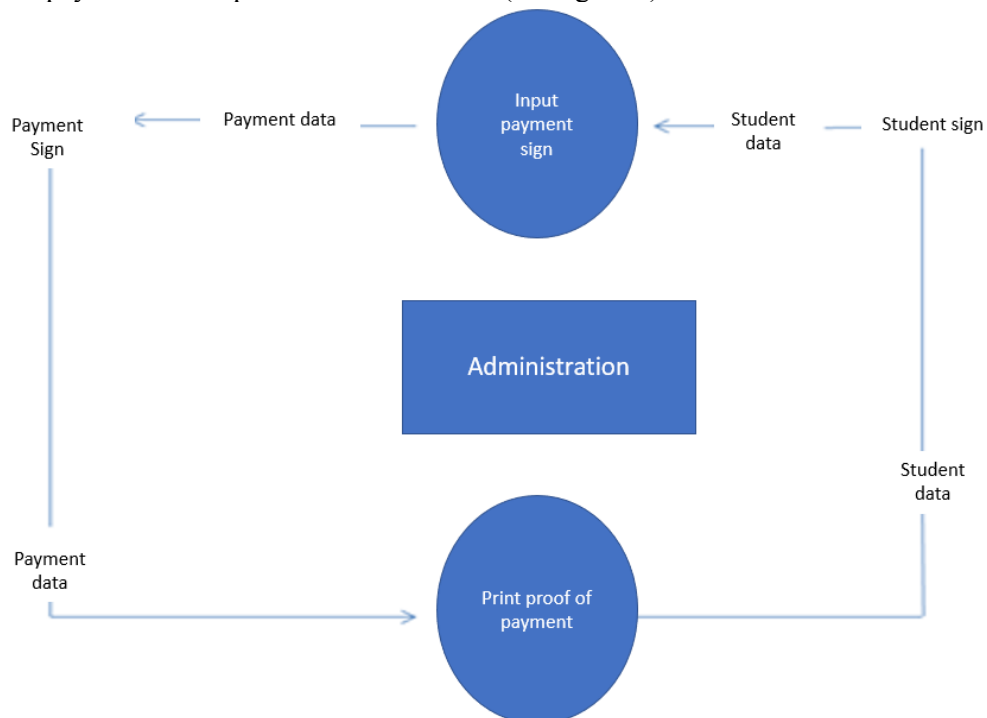
**Figure 2.** DFD Level 1

After making Data Flow Diagram level 1 then create a Data Flow Diagram (DFD) level 2 process 1 for the process of registering students enrolled in high school and reporting to the principal (see figure 3).



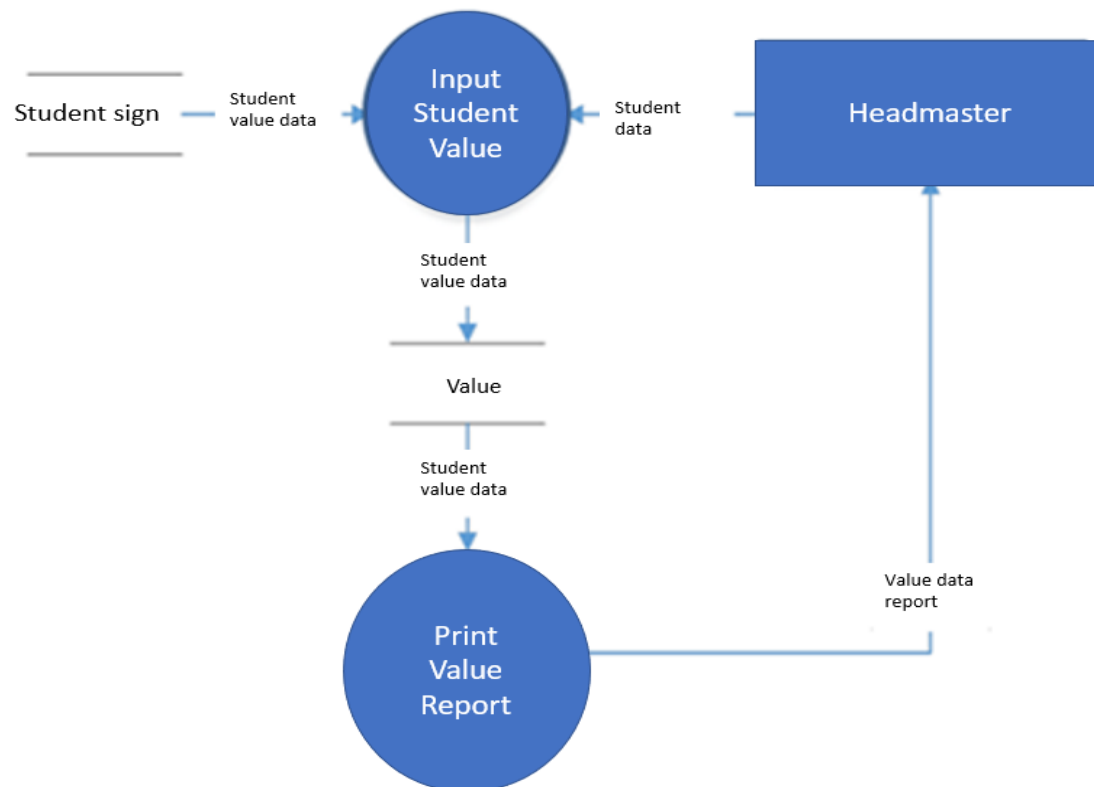
**Figure 3.** DFD Level 2 Process 1

The next step is to draw a diagram of the DFD level 2 process 2 that discusses the payment proof printing system and the payment data input that has been done (see figure 4).



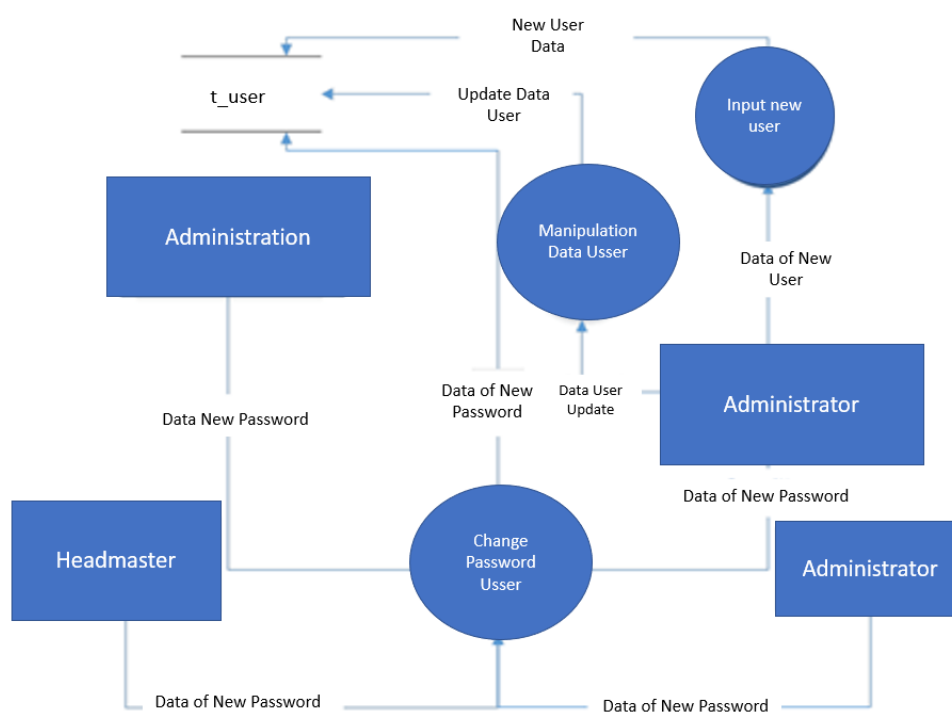
**Figure 4.** DFD Level 2 Proces s2

After making the payment system, the next step is to create a system for data collection and reporting of student grades that will be done by the teacher (see figure 5).



**Figure 5.** DFD Level 2 Process 3

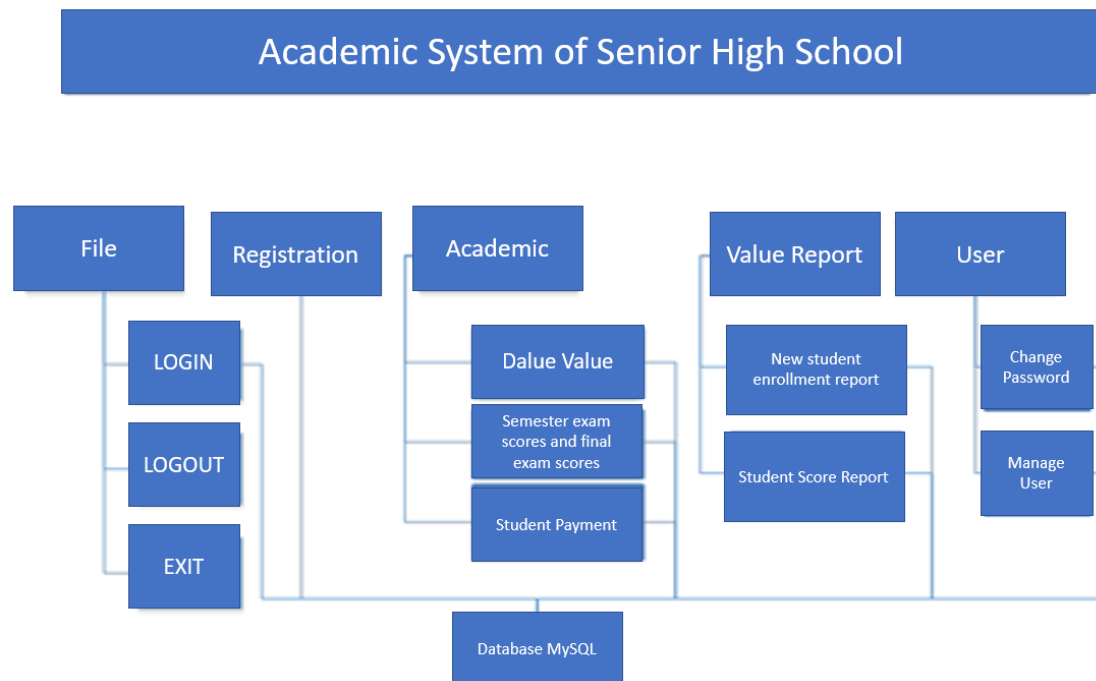
The final step is to make a picture of the whole system created before, from the administration, teacher, and principal (See figure 6).



**Figure 6.** DFD Level 2 Process 4

### 3.2. External and User Interface Requirements

An external interface for an IT-based administration system is needed to connect the needs of the user and the system interface itself. Here is the design that will be illustrated through the entire academic administration system chart for Smart School design (See figure 7).



**Figure 7.** External Interface Needs

As for the needs of the user interface, the system is processed using a desktop application. Employees interact with the application/software academic administration system through the local network (intranet) and process data from the user through a command that is typed by the keyboard and clicked by mouse. Output results already in though can be viewed on the monitor3.3 Hardware Interface, Operating System, and Network Usage Hardware Interface Requirements that are used by the academic administration system such as PC standard with the required operating system is Microsoft Windows (XP / Vista / 7/8/10), keyboard, mouse, and My SQL for database processing. Applications can be accessed if the user is using a local network (intranet), and controlled by the server.

### 3.3. Performance needs

To improve the performance of Smart School concepts, it requires a supported terminal to support the computer used to run the application, the person controlling the application, and the type of information that matches the application to be processed.

### 3.4. Smart School Program Reliability

This program has several advantages, including in terms of online enrolment, making administration payments, helping parents to communicate with their children's teachers, see the score of their children during study in the school, the program can be used on computers that have low specifications, especially windows, and can be used simultaneously with different computers.

### 3.5. Availability of storage capacity and security

This academic administration system has sufficient storage to accommodate data to be entered by students (profile data, messages), teachers (schedule data, profiles, messages, student scores) and admin

(profiles), with the reliable security of each user, because each user has access rights and different tasks, especially regarding the existing system problems (facing per-login).

### 3.6. System Maintenance

Smart School's maintenance system in fixing errors in the Smart School system software is divided into four systems, including the following:

1. Corrective Maintenance. This Maintenance is functioned to respond to the errors when the product is operated either in the form of bugs or in the form of outputs that are not in accordance with the user's needs.
2. Adaptive Maintenance. This maintenance serves to respond to changes that occur in the environment that affect the software (such as hardware, operating systems, business procedures, policies, etc.)
3. Perfective Maintenance. This Maintenance is functioned to respond to additional requests in the form of new functions that appear after the user to test the software
4. Preventive Maintenance. This Maintenance is done to re-engineering the software to be more easily repaired, has a high adaptability and easily accommodate the emergence of new needs.

### 4. Conclusion

Utilization of information technology in the education system is needed, especially for a senior high school in Indonesia. Currently, many countries in Asia such as India, Taiwan, Korea and some other countries have implemented IT-based education system. In some schools in Indonesia have already implemented IT-based education, but not yet a maximal still only form of curriculum only. While the concept of Smart School is not only about the implementation of the curriculum of IT subjects, but the whole system in the school that is integrated and utilize the Information and Technology system. The application of IT in the school system is very useful to overcome the limitations of human resources, and renewal in traditional teaching systems that tend to be boring and limited to space and time. It is hoped that the school system in Indonesia can start implementing Smart School System, especially in High School Senior High School as an initial step to improve the quality or ability of students in the field of information and communication technology.

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