

Academic information system mobile-web based at the cilacap nature school (SACIL)

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Abstract. Nature School is a school that uses nature as a learning medium. Cilacap Nature School abbreviated as SACIL is an educational institution with the concept of education in the open, namely nature as open space, teaching material media, and learning objects. One of the teacher's tasks is to make a Learning Plan. Learning activities and evaluation of students daily learning outcomes are written by the teacher in the communication book. Parents can monitor their children's learning outcomes through the communication book that students take home every day and take to school the next day. The system is considered to be less effective because student communication books are quickly broken, often tucked away, and even lost so that the individual learning history of students is difficult to trace back because there is no back up. Besides that, students often forget to bring back communication books to school while student learning activities must be written in the book so that guardian parents can know the activities at school and know the development of their child's learning. Standards for learning competency in the School of Nature must be delivered in stages. Therefore, the teacher must recap the Competency Standards both those that have not been submitted. This makes the task of the teacher very complex. On the other hand, the management of Academic administration that is currently running is still done manually (paper based). Calculation of student learning outcomes is done manually, so that mistakes often occur. Writing evaluation of student learning outcomes both qualitatively and quantitatively is done by hand writing. The method is considered inappropriate because there are often errors in the calculation and writing of student grades caused by human error. Based on the existing problems, it is necessary to develop an academic information system based on mobile web. The system functions as a medium in managing academic administration of students in Cilacap Nature School and as a medium of communication between parents and teachers using smartphone devices.

1. Introduction

Information Technology has provided an important role as a medium of information and communication in the field of education [1]. Even by paying attention to the demands of information needs that are increasingly fast and precise, encouraging information technology to be developed based on mobile. This is also supported by the role of the community, which currently has the majority of smartphone communication devices.

Nature School is a school that uses nature as a learning medium. In natural schools the child's curiosity can be channeled. Children are given the freedom to satisfy their curiosity without being hindered by the classroom [2]. School of nature is one of the new concepts in education, where

students are taught how to use and maintain nature for life [3]. The school of nature is born with the hope of being able to restore the essential values of human beings in integrating with nature [4].

Cilacap Nature School abbreviated as SACIL is an Educational Institution with the concept of education in the open, namely nature as open space, nature as a medium and teaching material, nature as an object of learning. The education level that is managed is Kindergarten and Elementary School Education. SACIL is located at Randu Street Cilacap.

The teacher in the Nature School is called a Facilitator. One of Fasil's tasks is to make a daily activity learning plan as a reference in teaching and learning activities (KBM). The daily activity learning plan is written every day according to the competency standards and talents of students with different material on a daily basis. Learning activities and evaluation of student learning outcomes are written by each Fasil in the communication book (paper based) as the student learning report. Guardian parents can monitor the learning outcomes of their sons and daughters through the communication book that students take home every day and take to school the next day.

The system is considered to be ineffective because the communication book containing the student activity report quickly breaks down, is often tucked away, and even disappears so that the learning history of individual students is difficult to trace back because there is no back up. Besides that, students often forget to bring back communication books to school while student learning activities must be written in the book so that guardian parents can find out the activities in the school and know the learning progress of the daughter every day. In basic education institutions, communication with parents is very much needed [5].

Standards for learning competency in the School of Nature must be delivered in stages without being missed. Therefore, Fasil must recap the Competency Standards that have been submitted and which have not been submitted. This makes the Fasil task very complex. On the other hand, the management of Academic administration that is currently running is still done manually (paper based). Calculation of student learning outcomes is done manually, so that mistakes often occur. Writing evaluation of student learning outcomes both qualitatively and quantitatively is done by hand writing. These methods are considered inappropriate because there are often errors in the calculation and writing of student grades caused by human errors.

Based on existing problem problems, it is necessary to develop an academic information system based on mobile web. The system functions as a medium in the management of students' academic administration in Cilacap Nature School and as a medium of communication between parents and Fasil using a smartphone (mobile based) device. With the existence of this system, it is expected that the management of students' academic administration will be more precise and organized, daily activity report can be known by parents of guardians at any time that can be accessed via smartphone, operational costs of SACIL become lower (paper less), Learning competency standards that have been delivered and what has not been delivered can be controlled properly through automatic notification of the system so that it simplifies and relieves the task of Facilitator. In addition, the Principal can know the academic activities report up to date at any time which can be accessed online using a computer (web based) or smartphone (mobile based).

2. Literature review

2.1. Related research

Research related to the development of electronic applications (Academic Information Systems) has been carried out by several previous researchers with different methods and solutions.

Research related to the title of academic service prototype on mobile based student complaints. In this study, the researcher made a prototype of an academic service application that could facilitate academics in accommodating complaints faced by students in the teaching and learning process. The application developed can be accessed through mobile devices. By using a mobile-based service system it is expected that a campus can serve or accommodate all complaints that students give to the

institution. This mobile-based academic service system is one alternative that can be developed by a campus to become a means of supporting services to students [6].

Other research related to the title of Designing Academic Information System in PAUD Omah Annaafi Children. The researcher made an academic information system on the web-based Omah Bocah Annaafi PAUD that was in accordance with the needs of academic activities at the institution. Data collection methods used are interviews with principals and administrative staff. The system development method uses the SDLC (System Development Life Cycle) approach model. The results of this academic information system research have been able to meet the needs of existing academic activities. In the process of further implementation, this system still needs to be developed by adding a mobile-based system [5].

Other research related to the title of Designing Mobile-Based Academic Activity Reminder Application. In the study, an application was developed to help the distribution of changes in academic information in real time and remind lecturers and students to carry out academic activities on schedule. The target to be achieved is to provide an academic activity schedule reminder application. This application consists of two parts, namely a web application to enter schedule changes, and a mobile application that is used to display daily academic activity schedules along with reminders of the schedule reminders [7].

Other research related to the title of the development of web-based academic information systems as a student value processing system at Kudus 1 Public Vocational School. This study aims to produce a value management information system to facilitate teachers in managing student report cards. This information system is intended for use in Vocational High Schools (SMK). The system developed is web-based, so that it can be accessed by teachers to manage values and students can see the results of their learning. The method used in this study is the research and development method (R & D) carried out at Kudus 1 Public Vocational School. The test results are stated that the web-based academic information system developed is very feasible to be used as a student value processing system. This is based on a number of assessments from 93.1% of system experts, 85.3% of teachers and administrative staff and 82.4% of students [8].

In contrast to related studies that have been done before. In this study, researchers made an Academic Information System Based on Mobile Web in Cilacap Natural School (SACIL). The system developed was in the form of the Cilacap Natural School Academic Information System (SACIL) which can be accessed via computer (web based) and Smartphone (mobile based). Some of the main functions of the system to be developed include administration of student and teacher data, processing of student grades, management of student activity reports as a medium for parents and teachers to monitor the development of student learning on a daily basis, management of Competency Standards and Nature School Learning Plans , and management of lesson schedules.

2.2. Basic theory

2.2.1. Academic information system. Academic Information System (SIKAD) is an application or system designed and created to manage data related to academic information. SIKAD is an online based information system that aims to establish Knowledge Based Systems that can be accessed using the internet [9]. Academic information systems can also be defined as a system created to process data and information relating to academics in an educational institution or institution both formal and informal from the basic level to the university level [8].

2.2.2. Management of nature schools. School of nature is one of the new concepts in education, where students are taught how to use and maintain nature for life [3]. The school of nature applies learning patterns in the open to train student's cognitive, affective, and psychomotor, with three main materials, namely piety, science, and leadership. The three materials are applied by applying exemplary methods, the development of logic is done by applying theory in the form of practice, as well as outbound training to build students' leadership skills [4].

The preparation of the curriculum is based on the idea of how to create a learning system that is fun and attracts the interest of students to learn it. There are several things that must be considered in creating learning that is fun and attracts the interest of students to learn it so that students really like, appreciate, implement, and engage in this natural preservation process, namely [2]:

- Learning must form an exploratory spirit of students. Students who have an explorative spirit will find a way for every problem that is encountered, including every problem in nature conservation.
- Creative activities of creative activities are the other side of the currency of an explorative soul. If students are explorative, they will be creative. Creative students are not easily discouraged and always think of new ways to preserve nature.
- Integral activities are characterized by the success of students who are intact in their soul, meaning that the students fully understand what will be done to this nature. School of nature is a school that uses nature as a learning medium. In natural schools the child's curiosity can be channeled. Children are given the freedom to satisfy their curiosity without being hindered by the classroom.

2.2.3. Mobile web based. Web-based mobile applications generally are display web applications in the form of mobile. So, to use this application, users can simply access the web browser on a smartphone device. Before the popular mobile era, many sites used to appear on mobile devices on the desktop. Mobile applications have faster performance compared to mobile web [10]. Academic Information System mobile web based is an information system that is used to process student academic data that can be accessed online via computer (web based) and via smartphone (mobile based).

3. Methodology

The research was conducted in several stages, namely: Viewing and analyzing the management of existing conditions, mapping existing processes, looking for problems in the running administrative process, finding the source of problems, and designing and developing a system that can developed to reduce or eliminate existing problems. The following are research materials, research tools, and research paths "Academic Information System Mobile Web based at the Cilacap Natural School (SACIL)".

3.1. Research materials

In this study, the research materials used are as follows:

- Data obtained from analyst studies that have been conducted at Cilacap Natural School both through interviews and observations.
- Data obtained from a literature study an Academic Information System Mobile Web based.
- The process of academic administration program running
- Information about the development of an existing academic information system.

3.2. Research tool

The research tool used in this study is a computer device that has sufficient specifications, mobile devices (smartphones), developer software, and graphic design software.

3.3. Research path

In the process of developing an Academic Information System Mobile Web Based at the Cilacap Nature School, the researcher refers to the general software development method, namely the System Development Life Cycle (SDLC) development method. This method serves to develop, maintain and use a system that includes a number of phases or stages as shown in Figure 1.

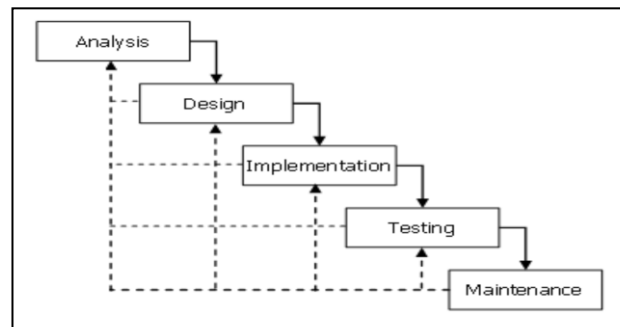


Figure 1. Waterfall model [11].

The method of developing the waterfall model consists of several phases / stages. The method will be used in the development of the academic information system mobile web based at the Cilacap Natural School (SACIL) ".

- **Planing Stage**
Feasibility is identifying problems, determining system objectives, and making feasibility studies (techniques, operations and schedules). The investigation system and observations and interviews.
- **Analysis & Requirement Phase** in the planing stage there are two steps, namely:
 - Information analysis is about the information from the Cilacap nature School and the management process of the Academic administration that has been running.
 - User analysis is to determine user needs, in the sense of identifying users who will use system.
 - Technology analysis is to determine the system needs of both software and hardware.
- **Design Stage**
At the design stage there are several stages, including:
 - Development model is a model that will be used as a system architecture. This model describes the relationship (relationship) of the whole system, between all functions in a separate module, changes or transfer of data from modules in the system.
 - Database design is the relation between tables can be normalized, and describe in detail the input and output of data.
- **Implementation Phase**, that is prototyping software.
- **Testing Phase**, that is the stage of system testing and system improvement developed.
- **Maintenance Phase**, that is the stage repairs are made if there is an error and improve the performance and quality of the application developed.

3.4. System design

System design is carried out by estimating an academic administration which are described in the form of activity diagrams, Context Diagram, and Data Flow Diagrams (DFD).

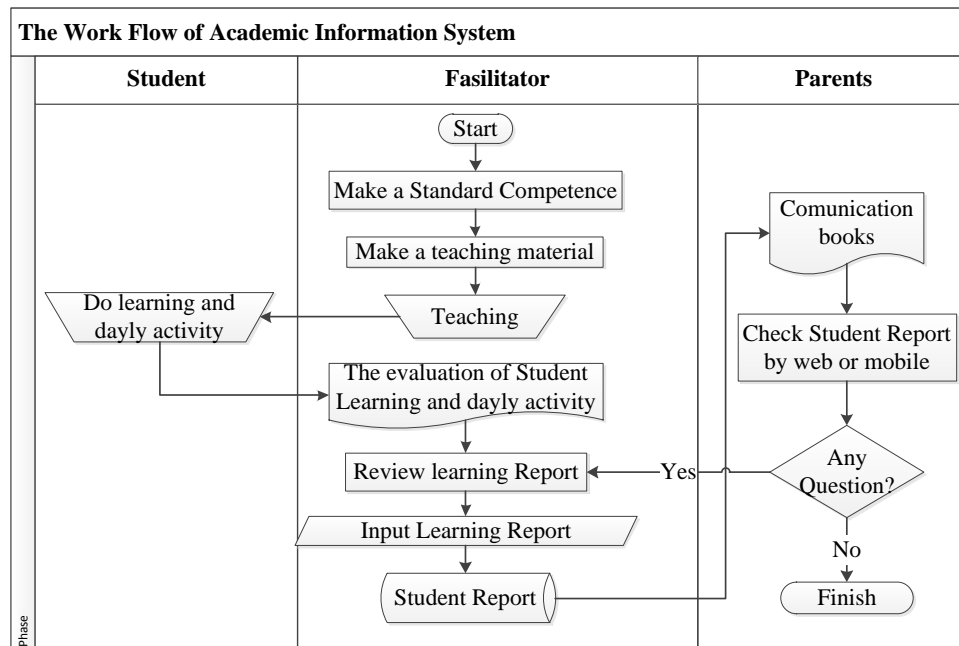


Figure 2. The activity diagram of system.

Figure 2 shows the flow of the academic information system management process that involves three actors. There are teachers, students and parents. The first process starts from the teacher who sets the standard of learning competence, makes learning material, and evaluates student learning outcomes. Parents can find out their children's learning outcomes at any time through the existing communication book features in the application by using a computer or smartphone. The developed information system network topology is shown in Figure 3.



Figure 3. Network topology of information system.

This figure, shows the information system network topology that will be developed. Users can access the system by a computer (web based) or smartphone (mobile based)[12].

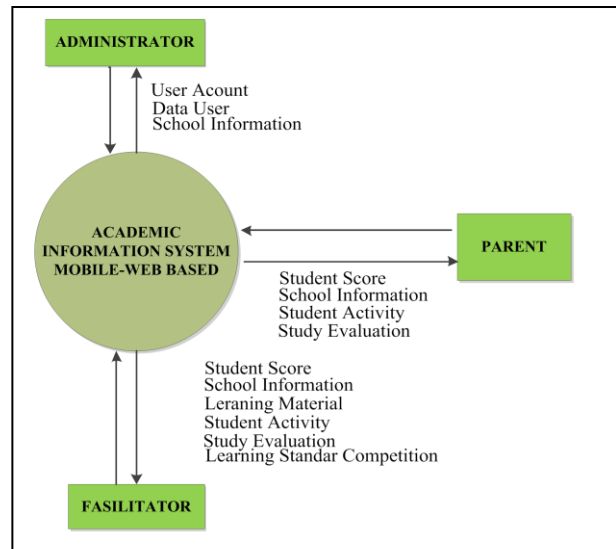


Figure 4. Context diagram.

This figure shows a context diagram that illustrates the overall system function. There are 3 users who can access the system to input data into the system and get data from the system, there are administrators, teachers, and parents.

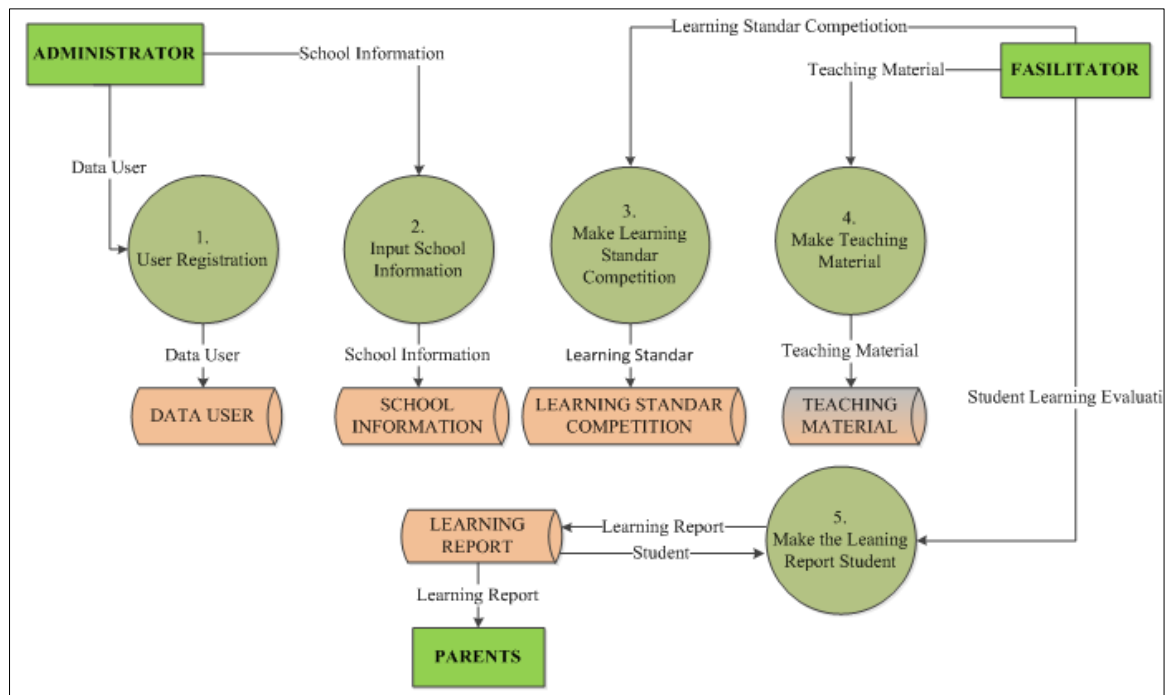


Figure 5. DFD level 0 academic information system proses.

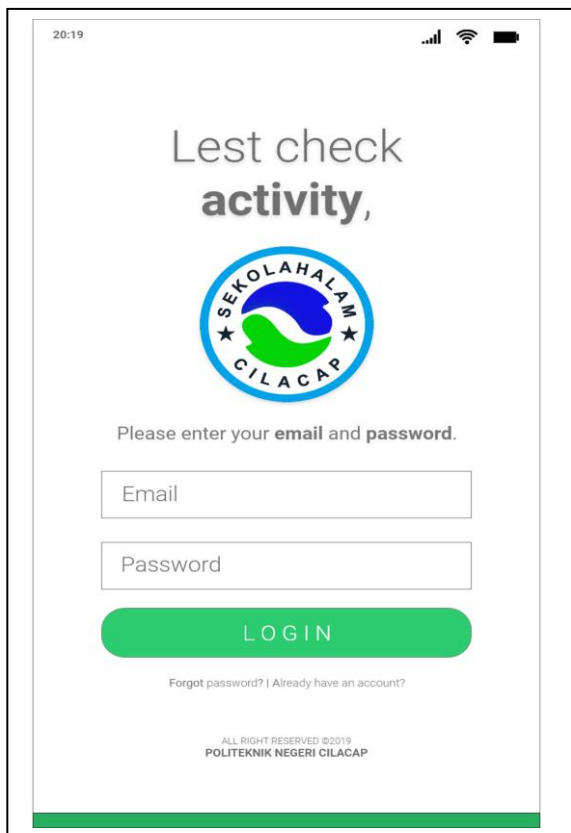
Figure 5 shows the main functions that will be developed in the academic information system which is a derivative of the context diagram. In the picture shows the data streams in each main process.

4. Result and discussion

Design of system that has been made will proceed to the implementation stage, that is developing Academic Information System mobile-web based at the Cilacap Nature School (SACIL). The main outcome developed in the system is the management of learning outcomes evaluation and monitoring of student learning outcomes conducted by teachers and parents by utilizing academic information systems that can be accessed by using a computer (web based) or smartphone (mobile based).


4.1. Manajement of student learning evaluation

Evaluation of student learning outcomes at Cilacap natural schools is carried out in several stages, there are evaluation of daily activities, evaluation of weekly activities, evaluation of monthly activities, and evaluation of middle years (6 months). In the evaluation of daily activities, each student will be given an assessment by the teacher on the same day as shown in Figure 7. Before entering the main menu, the user must login as shown in Figure 6.



20:19

Lest check
activity,



Please enter your **email** and **password**.

Email

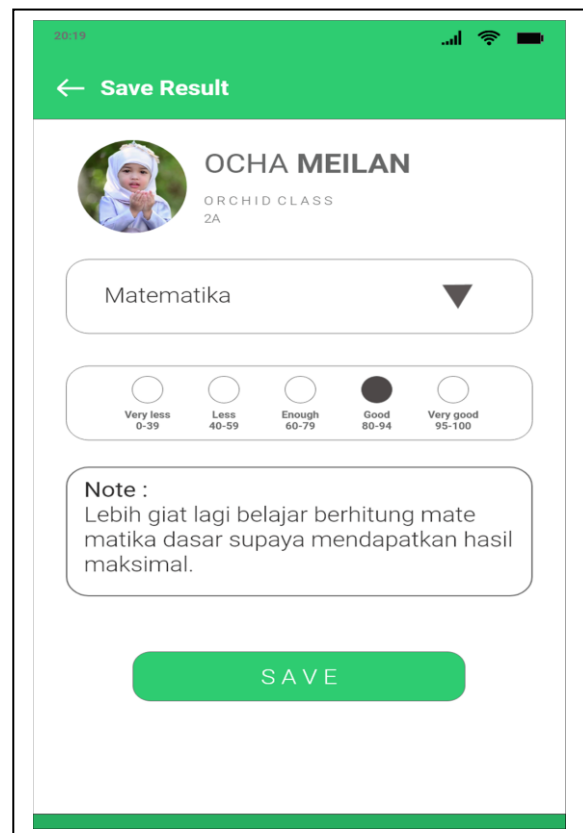
Password

LOGIN

Forgot password? | Already have an account?


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Figure 6. Login page.
This figure shows the login page of user.



20:19

← **Save Result**

 **OCHA MEILAN**
ORCHID CLASS
2A

Matematika ▼

☐ Very less
0-39

☐ Less
40-59

☐ Enough
60-79

☒ Good
80-94

☐ Very good
95-100

Note :
Lebih giat lagi belajar berhitung matematika dasar supaya mendapatkan hasil maksimal.

SAVE

Figure 7. Daily activity evaluation.

Figure 7 shows the input form of student learning evaluation at the stage of daily activities. First the teacher chooses the subjects studied and then provides a qualitative assessment by selecting one of the radio buttons assessment list that has been provided. There are several criteria for the assessment results are very less, less, enough, good, and very good. The value of daily activities will be recap into the value of weekly activities as shown in Figure 8.



	WEEK 1	WEEK 2	WEEK 3	WEEK 4
Pendidikan Agama Islam dan Budi Pekerti	Nilai : 100			
Pendidikan Pancasila dan Kewarganegaraan	Nilai : 80			
Bahasa Indonesia	Nilai : 80			
Matematika	Nilai : 80			
Penjasorkes	Nilai : 75			
Seni Budaya dan Prakarya	Nilai : 75			
Bisnis	Nilai : 75			
IT	Nilai : 65			
Akhlak	Nilai : 70			
Islamika	Nilai : 100			

Figure 8. The value of weekly activities.

This figure shows a recapitulation of students' weekly scores. There is an average grade of students in each subject.

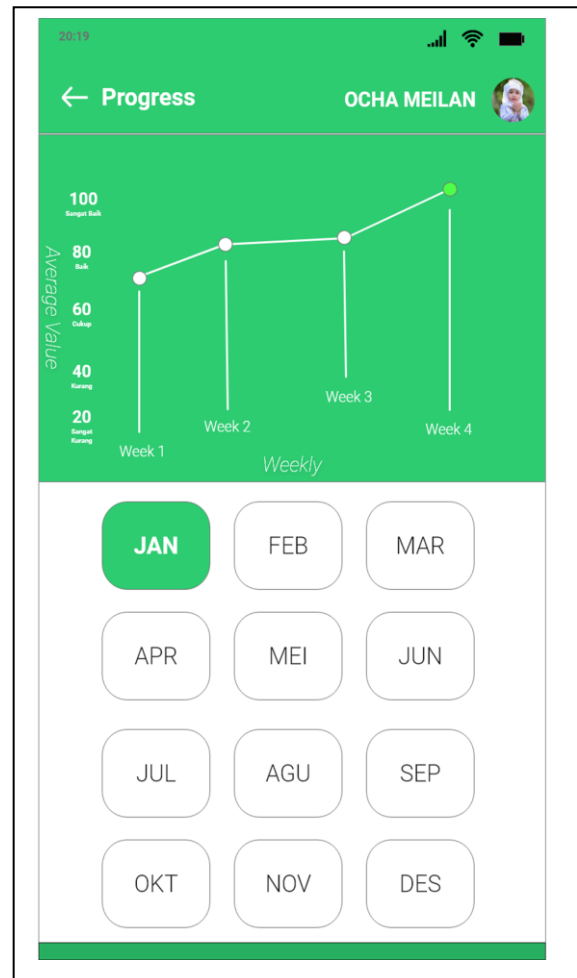


Figure 9. Graph of weekly activity values.

This figure shows a graph of subject values in weekly activities. On the graph it can show the development of the average value of lessons each week.

4.2. Monitoring of student learning evaluation

One of the roles of parents in their children's learning activities is to monitor the progress of learning outcomes and evaluate the learning process so that the results obtained are even better. In the academic information system developed, parents can find out the learning activities carried out at school and know the evaluation of learning outcomes through the communication book feature that can be accessed by parents through a smartphone (mobile based). These features can be shown in Figure 10 and Figure 11.

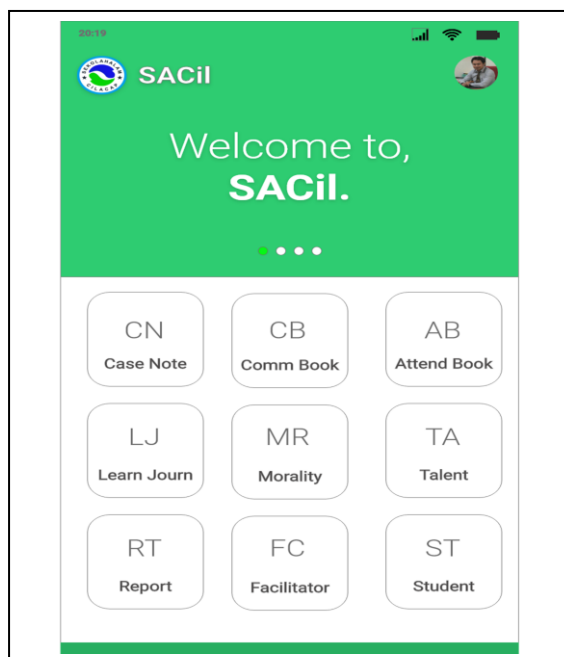


Figure 10. Main page.

This figure shows main page of academic information system at Cilacap Nature School

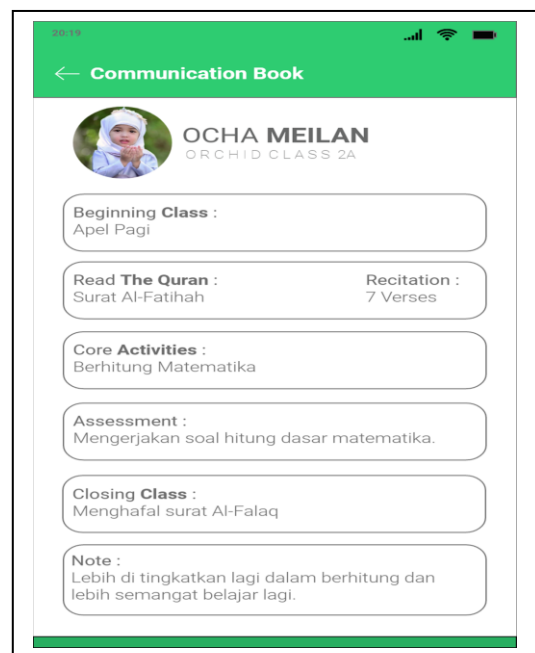


Figure 11. Communication book.

This figure shows the information of student learning activities and learning evaluation. This feature has a function to inform learning activities to parents that are accessed by using a smartphone (mobile based)

4.3. Testing system

Testing System is done by white box testing method. Tests carried out by 10 respondents with results as shown in Table 1.

Table 1. Testing system.

No.	Assessment	Test Result		
		NA	A	SA
1.	Academic management at the Cilacap Nature School is more organized	0	1	9
2.	Parents can find out daily activities up to date through the mobile application	0	2	8
3.	The facilitator can control the learning material that has been taught and which has not been taught to students	0	2	8
4.	Calculation of students score becomes more accurate and reduces human error	0	5	5
5.	Making Competency Standards Student learning becomes easier and more effective	0	6	4
		Amaount	0	16
		Presentage (%)	0	32
			32	66

Notes : NA = Not Agree, A = Agree, SA = Strongly Agree

Table 1 shows the results of the system testing conducted by 10 respondents. Based on the results of these tests it can be stated that in general that an Academic Information System Mobile Web Based at Cilacap Nature Schoole very helpful in the management of the academic administration.

5. Conclusions

Based on the research that has been done by developing an academic academic information system mobile web based at the Cilacap natural schools and has tested the system with 10 respondents, the results showed 66% of respondents stated strongly agree that with the existence of information systems, academic management becomes more organized, parents can know daily activities and children's learning outcomes up to date through smartphones, the facilitator can control the learning material that has been taught and that has not been taught to students, calculating student grades becomes more accurate and reduces human error, making student competency standards easier and more effective.

Suggestions that can be made for system development in subsequent research is the need to develop financial management functions in the Academic Information System at the Cilacap Nature School. thus the leader can know the condition of the school's finances.

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