



Improving the Quality of Teaching Programs at Schools Through the Development of Web-Based Information Systems

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Abstract

This research aims to develop an information system that can facilitate the data management of student activity in teaching programs at schools. The teaching program at school policy issued by the Ministry of Education and Culture which is one of the Independent Campus Independent Learning programs. The research method used in information system development is the waterfall research method as a system development pattern. The results of the system design have provided a web-based information system service that can help study programs and students in managing teaching program activities at Schools.

Keyword: Web-Based System, Teaching Program, Data Management

1 INTRODUCTION

The Independent Campus Independent Learning policy issued by the Ministry of Education and Culture since 2019 has now been implemented for almost 5 years at all levels of education in Indonesia, from primary education, secondary education to higher education. There are several types of activities that are available or can be carried out in the independent campus program, namely: 1) certified internship; 2) independent study; 3) teaching program; 4) Indonesian International Student Mobility Awards (IISMA); 5) student exchange; 6) building villages (thematic); 7) humanitarian projects; 8) research; and 9) entrepreneurship [1]

The teaching program at schools as part of the Independent Campus Independent Learning policy which carries out learning and teaching activities in primary and secondary education levels aims to equip students with a variety of expertise and skills and also an effort to provide opportunities for students to learn outside the classroom by becoming partners with teachers in learning who are expected to be able to innovate, develop strategies and learning models that are creative, innovative and pleasant [1]

Gorontalo State University as one of the universities that organizes the Independent Campus Independent Learning program has provided full support and strives to always carry out each independent campus program as directed and as well as possible. The implementation of the teaching program at schools organized by the

Quality Assurance and Learning Development Unit is one of the strategic steps of Gorontalo State University in increasing the capacity and quality of education in schools in the Gorontalo Province and surrounding areas, especially for schools in remote areas, leading and lagging behind, so it is hoped that it can be a solution to the problem of teacher shortages in certain subjects, as well as an effort to accelerate 21st century learning based on digital technology.

For Information Technology Education Study Programs in Engineering Faculties in Gorontalo State University, its implementation the teaching program at schools is inseparable from various obstacles faced by administrators, study programs, field supervisors, course lecturers and students participating in the program. [2]The data processing carried out has not yet implemented an information system, students still send files and activity plans via Google Drive links, making it difficult for supervisors lecturers, tutor teachers and course lecturers to monitor program designs created by students, as well as difficulties when monitoring daily, weekly and final student reports.

Therefore, the development of information systems is very much needed in an effort to improve the quality of the implementation teaching program activities in schools, [3]especially for study programs. [4]An information system is a system that involves the management of human resources, data, processes and results in the form of information for parties who need it [5].

Based on description that has been explained, this research was conducted to design an information system for teaching programs at schools [6]on independent campus activities that can help study programs [7]and students in managing teaching program activities at Schools.

2 METHODS

The system development method used is Waterfall, which is a systematic and sequential information system development model, where each stage is carried out sequentially and cannot be continued to the next stage if the previous stage has not been completed[8]. [9]The flow of information system development using the waterfall method in this research is shown in the figure 1 below:

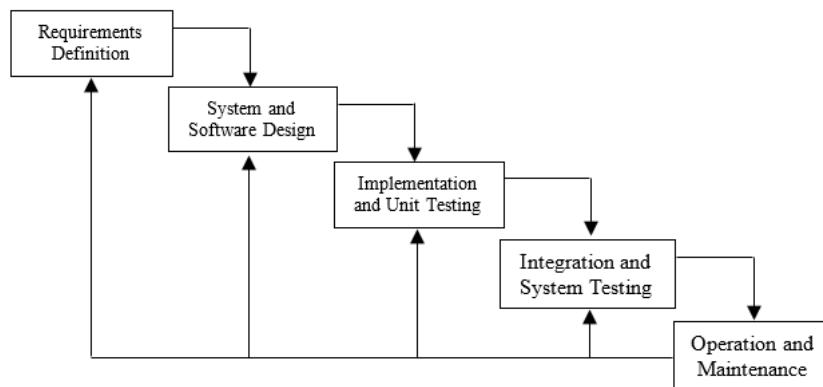


Figure 1. Waterfall Method Work Stages (Pressman, 2002).

An explanation of each stage is described as follows:

1) Requirements Analysis

At this stage, identification of existing problems is carried out and also identification of the steps that will be taken in creating a system that can accommodate teaching program activities in schools managed by the study program in accordance with the expected objectives. At this stage, it also produces planning for functional and non-functional requirements for the Information System. Data collection was carried out through interviews and literature studies related to information system development.

2) System Design

The system design stage is related to database design in the form of creating a database structure, tables and fields according to system requirements.

3) Implementation

This stage is to implement planning and design into an information system. At this stage, coding or designing the information system is carried out so that it becomes an appropriate program based on the needs of the analysis carried out previously.

4) Integration and System Testing

The testing stage is carried out to ensure that the system that has been designed is correct and in accordance with the business processes that have been previously analyzed. testing is carried out on the information system as a whole to avoid system errors.

5) Operational and Maintenance

At this stage, maintenance is carried out on the system, so that errors that occur during system implementation can be immediately corrected.

3 RESULTS AND DISCUSSION

3.1 Results

3.1.1. Data Analysis

This stage produces planning for functional and non-functional requirements for the Information System which can be seen in table 1 and table 2 below:

Table 1. External Entity (Functional Requirements)

Entity	Fitur
Head of Study Program	Management of student participants
Management of Supervisors Lecturers	
	Management of Tutor Teachers
	Management of Operators
Supervisor Lecturers participants	Management of student
Tutor Teachers student participants	Management of

Course Lecturers
student participants

Management of

Students

Upload Plan Activity

Upload daily logbook

Upload weekly logbook

Upload reports

Table 2. Hardware and Software Requirements (Non-Functional Requirements)

Hardware	Software		
Proc. Intel(R) Core™ i3 Windows 10 (64-Bit)		Microsoft	
CPU M350 @2.27GHz, 2.27 GHz		Visual Studio Code	
Memory 4GB	XAMPP v. 7.3		
VGA Intel(R) HD Graphics		Database	MariaDB
HDD 500GB			

3.1.2. System Design

The flowchart design of the proposed system to be developed is shown in the figure 2 below.

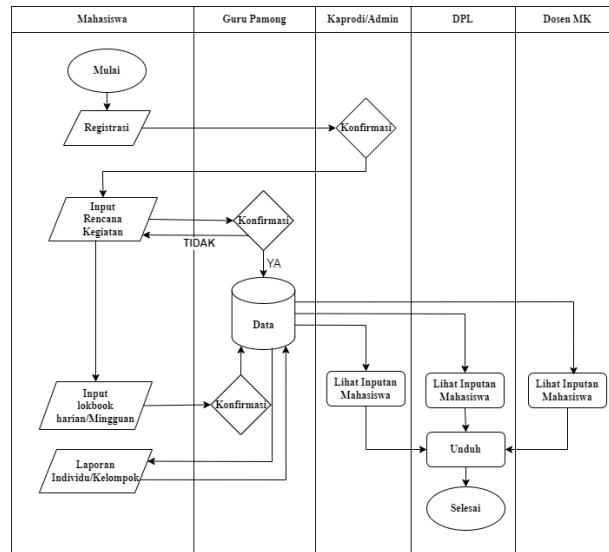


Figure 2. Proposed System Flowchart

The data structure design can be seen in the context diagram and level 0 diagram as shown in the following image

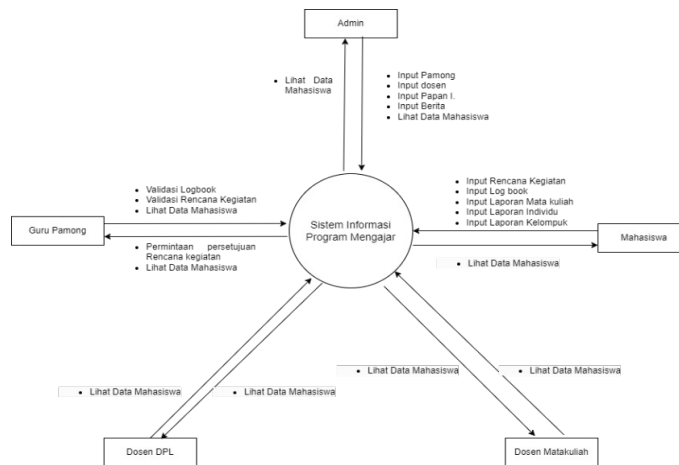


Figure 3. Context Diagram

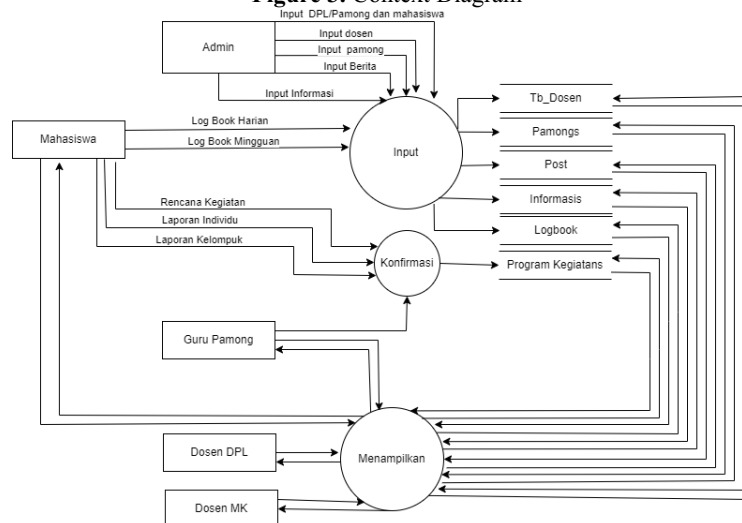
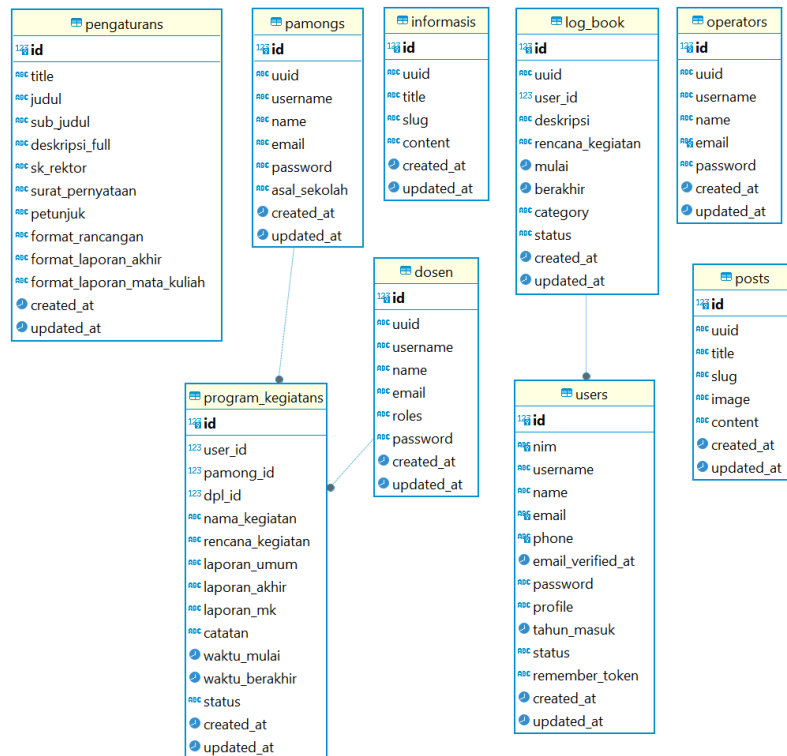


Figure 4. Level 0 Diagram

3.1.3. Database Design

**Figure 5.** Database Relations

3.1.4. Implementation

At this stage, all designs that have been prepared at the design stage are created in prototype form using the PHP programming language. The prototype results are as

follows:

The figure displays three web pages from the SI-PMS system. The leftmost page is the main dashboard, featuring a purple header with the text 'Kuliah Di Teknik Menyenangkan', a 'Statistik' section with three cards labeled 1, 2, and 3, a 'Papan Informasi' section with a table, and a footer with the text 'Sistem Informasi PMS - UNIVERSITAS NEGERI GORONTALO'. The middle page is the 'REGISTRASI MAHASISWA' form, which includes fields for 'Nama', 'Username', 'Email', 'Nomor Whatsapp', 'Tahun Masuk', 'password', and 'konfirmasi', along with a checkbox for terms and conditions. The rightmost page is the login page, titled 'Kampus Merdeka INDONESIA', with fields for 'Username' (pre-filled with 'Admin'), 'Role' (a dropdown menu), and 'Password', followed by a 'Login' button and a link for 'Sudah Punya Account ? Registrasi'.

Figure 6. Main, Register, and Login Page

The main page is the start page when opening the system web, then proceed to the account registration page to be able to log in using the website.

On the student page there is a dashboard which contains student profile information, and there is also an activity design page where students can upload the activity plans that have been prepared.

The figure shows two screenshots of the student dashboard. The top screenshot is the 'Dashboard' page, which includes a sidebar with 'Dashboard', 'Rencana Kegiatan', 'Log Book', and 'Laporan'. The main content area features a student profile picture and a form for 'Rencana Kegiatan' with fields for 'Nama', 'Nama Lengkap', 'Email', 'Nomor Telepon', and 'Angkatan'. The bottom screenshot is the 'Rencana Kegiatan' page, which displays a table of activity plans. The table has columns for 'Planning', 'Disusun', 'Waktu Mulai', 'Waktu Berakhir', 'Total Hari', 'Sisa Hari', and 'Status Rencana Program'. The first row shows a plan for 'Pembuatan 5. Puluhan' by 'Siti Suhada S. Ham RIT' with a status of 'Belum Di Selesaikan'.

Figure 7. Student Dashboard Page and Student Activity Plan Page

The logbook page is a page for monitoring student activities while the school teaching program is being implemented. On this page, supervisors and tutors can monitor the activities carried out by students.

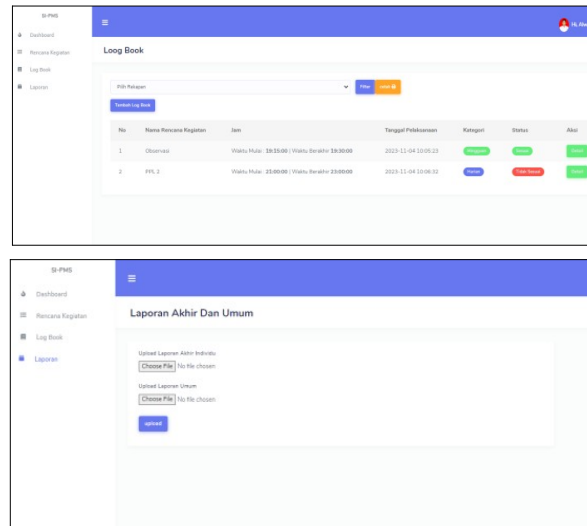


Figure 8. Student Logbook and Student Report Page

Then on the course lecturer, the tutor teachers and the supervisor lecturers page there is a display of the student program participant page, where the course lecturer and the tutor can see details of the student's program and can view student activity plans and their reports, approve these reports and provide notes.

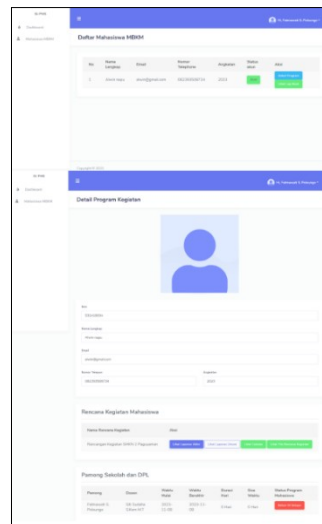


Figure 9. Student Activity Plan Page

On the head of study program page there are statistics on the number of students, tutor teachers, supervisor lecturers and the number of course lecturers.

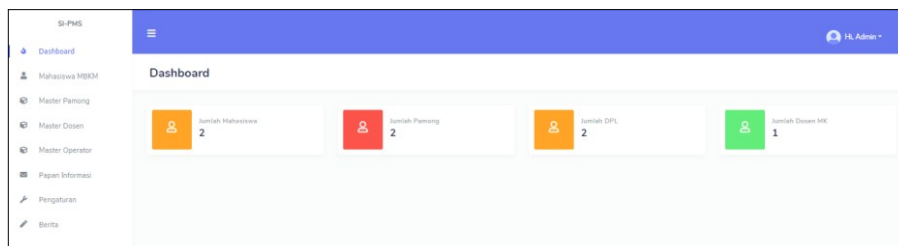


Figure 10. Dashboard Page of Head of Study Program

3.2. Discussion

Information system of the Teaching Program in Schools is designed to help monitor the activities and processes of student program participants, so that the teaching program can be well organized.[10] This research adopts a system development method using a waterfall model approach which consists of the stages of analysis, system design, coding, implementation, testing, program implementation and maintenance. [11] Developing students' insight, character and Soft Skills, encouraging and spurring national development by fostering community motivation to participate in development; and increasing the real role and contribution of universities and students in national development. [12]The system design has produced a web-based information system of teaching program in schools that can assist information technology education study programs in managing and monitoring student activities. [13]Teaching practice at school can directly improve student competence.[14] Informatics subjects are one of the lessons in the implementation of the independent curriculum

4. CONCLUSIONS

This research produces an information system for teaching programs in schools which are included in the Independent Campus Independent Learning activities in the Information Technology Education Study Program, Faculty of Engineering, Gorontalo State University. The results of the system design have provided a web-based information system service that can help study programs and students in managing teaching program activities in Schools. [15] Students who run the Teaching Campus program can develop students' insight, character and soft skills, hone their thinking skills in working both with teachers and with students across fields of science in solving problems that exist in society.

5. REFERENCES

- [1] V. Cruickshank, S. Pill, and C. Mainsbridge, “‘Just do some physical activity’: Exploring experiences of teaching physical education online during Covid-19,” *Issues Educ. Res.*, vol. 31, no. 1, pp. 76–93, 2021.
- [2] C. Wang, R. D. O. Dev, K. G. Soh, N. J. M. Nasiruddin, and Y. Wang, “Effects of Blended Learning in Physical Education among University Students: A

- Systematic Review,” *Educ. Sci.*, vol. 12, no. 8, 2022, doi: 10.3390/educsci12080530.
- [3] A. Rahayu, Sumaryanti, and N. I. Arovah, “the Validity and Reliability of the Physical Activity Questionnaires (Paq-a) Among Indonesian Adolescents During Online and Blended Learning Schooling,” *Phys. Educ. Theory Methodol.*, vol. 22, no. 2, pp. 173–179, 2022, doi: 10.17309/tmfv.2022.2.04.
- [4] W. Zheng, Y. Y. Ma, and H. L. Lin, “Research on Blended Learning in Physical Education During the COVID-19 Pandemic: A Case Study of Chinese Students,” *SAGE Open*, vol. 11, no. 4, 2021, doi: 10.1177/21582440211058196.
- [5] N. K. Masgumelar and W. D. Dwiyoogo, “Development of Game Modification Using Blended Learning in Physical Education, Sports, and Health For Senior High School Students,” vol. 29, no. Icssh 2019, pp. 95–100, 2020, doi: 10.2991/ahsr.k.201107.024.
- [6] A. H. Al Qudah, S. A. Rashidrashid, D. Iffah, and N. A. Al Ani, “The impact of blended learning in improving fitness elements at sixth grade students in Jordan,” *J. Entrep. Educ.*, vol. 21, no. 4, 2018.
- [7] M. S. Taufik, A. F. Ridlo, S. Solahuddin, T. Iskandar, and B. S. Taroreh, “Application of YouTube-Based Virtual Blended Learning as a Learning Media for Fundamental Movement Skills in Elementary Schools during the Covid Pandemic 19,” *Ann. Appl. Sport Sci.*, vol. 10, no. 1, pp. 1–10, 2022, doi: 10.52547/aassjournal.1020.
- [8] D. Chaloupský, P. Chaloupská, and D. Hrušová, “Use of fitness trackers in a blended learning model to personalize fitness running lessons,” *Interact. Learn. Environ.*, vol. 29, no. 2, pp. 213–230, 2021, doi: 10.1080/10494820.2020.1799027.
- [9] C. V. Huy, N. T. Luong, and N. N. V. Vu, “Blended learning in badminton training for professionals: students,” *Eur. J. Phys. Educ. Sport Sci.*, vol. 6, no. 6, pp. 28–36, 2020, doi: 10.46827/ejpe.v6i6.3226.
- [10] E. Kastrena, E. Setiawan, and A. Adawiyah, “Moving from Traditional Teaching to Blended Learning in the Teaching and Learning of Sports Test and Measurement Course to Improve Students’ Learning Outcomes,” *2nd Int. Conf. Innov. Exhib. Glob. Educ.*, no. August, pp. 146–151, 2020, doi: 10.22236/ie.v1i1.109.
- [11] Cinar, I. O., & Gursoy, E. (2018). The effectiveness of blended learning on skill acquisition in physical education. *Educational Research and Reviews*, 13(9), 401-407. <https://doi.org/10.5897/ERR2018.3608>.
- [12] Dolev-Cohen, M., & Meir, A. (2020). The effect of blended learning on achievement goals and physical activity levels in physical education classes. *Education and Information Technologies*, 25(1), 385-399. <https://doi.org/10.1007/s10639-019099333>.
- [13] Lin, C. H., Lin, J. W., & Huang, Y. C. (2019). Learning performance and motivation of physical education in a blended learning environment. *Journal of Educational Technology and Society*, 22(3), 226-236. <https://doi.org/10.2307/jeductechsoci.22.3.226>.

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