Information System for Monitoring the Development of Children With Special Needs

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Abstract

The supervision of students, particularly those with special needs, is predominantly carried out by schools. However, due to the busy schedules of many parents, continuous monitoring of their children's development at school is often limited. Typically, parents only receive information about their child's learning progress once a semester, during the distribution of report cards. This delayed communication highlights the need for a more efficient and timely system at SLB C YPPLB 2 Makassar to provide parents with ongoing updates about their child's development. This study aims to design and implement an information system for monitoring the development of children with special needs at SLB C YPPLB 2 Makassar City. The system is intended to facilitate direct and real-time communication between the school and parents, enabling parents to monitor their child's progress actively. The research methodology involved data collection through observation, interviews, and documentation. The system was developed using a structured approach, which included Needs Analysis, System Design, Implementation and Unit Testing, System Integration/Testing, and System Maintenance. BlackBox testing was employed to evaluate the system's functionality. The findings of this study indicate that the development monitoring system for children with special needs at SLB C YPPLB 2 Makassar City is highly effective, with a usability score of 90%, reflecting a strong positive response from users. This research contributes to the body of knowledge by demonstrating how an information system can bridge the communication gap between schools and parents of children with special needs, fostering more proactive and informed parental involvement in the educational process.

Keywords: Monitoring System; Child Development; Children with Special Needs.

Introduction

In Indonesia, the history of the development of extraordinary education began when the Dutch entered Indonesia (1596-1942), they introduced a school system with a Western orientation. For education for children with special educational needs special institutions (Theo, 2018). The first institution for the education of blind children was opened in 1901, for children with mental disabilities in 1927, and for deaf children in 1930, all three in Bandung (Tschapka & Nawangsari, 2022). Seven years after the proclamation of independence, the government of the Republic of Indonesia promulgated the first law on education (Zamjani & Zamjani, 2022). Regarding children who have physical and/or mental disorders, the law states: Exceptional education and instruction is provided specifically for those in need (article 6 paragraph 2), and for that, the children are subject to Article 8 which says: all children who are already 6 years old are entitled and those who are already 8 years old are required to study in school for at least 6 years. With the enactment of the law, new schools specifically for children with special educational needs, including for children with disabilities and the disabled, were opened. These schools are called excellent schools (DeLaina et al., 2021).

Partly based on the historical order of establishment of Extraordinary Schools for each of the disability categories, grouped into Extraordinary Schools Part A for visually impaired children, Extraordinary Schools, and Part B for deaf children. Extraordinary School Part C for children with mental disabilities. Extraordinary School Part D for children with disabilities. Extraordinary School Part E for children with disabilities. Extraordinary School Part G for children with multiple disabilities (Riza et al., 2020). Our research on the Extraordinary School of SLB C YPPLB 2 Makassar City is a special school for rehabilitated children or education for children with special needs, the school educates and

guides children who have physical mental, and intellectual deficiencies. Several outstanding schools that accommodate different types of disorders are built to complete the 9-year compulsory education (Pautina et al., 2019).

In addition, various efforts were also carried out, one of which was the socialization and implementation of inclusive education (Adiputra et al., 2019). Child development is a biological, psychological, and emotional alteration that occurs in a child from the results of the maturation of the child's psychic functions and physical functions (Abraham & Feldman, 2022). On environmental factors and the learning process in a certain time towards maturity. During the developmental period, children will have new intelligence as well as compound intelligence (Hamza et al., 2020).

Children with special needs are children who experience abnormalities or deviations in the process of growth or development in the form of physical, mental, and emotional. Children with special needs compared to normal children, in general, need special education services (Demchenko et al., 2021). Children with Special Needs are children who have differences from other children in general (Dhiman et al., 2020). This child is said to have special needs if there is something less or even more in him (Tokatly Latzer et al., 2021). Children with Special Needs are children who need special treatment in connection with developmental disorders and disorders experienced by children (Jeste et al., 2020). Those classified as children with special needs can be grouped based on disorders or abnormalities in physical/motor, cognitive, speech & speech, hearing, vision, and social and emotional aspects (Naruvita et al., 2022). In general, children with special needs need educational services that are different from other normal children (Sulasmi & Akrim, 2019). The services provided for children with special needs are services that have been implemented by the government (Tohara & others, 2021). Through the Regulation of the Minister of National Education Number 70 of 2009, the government initiated inclusive education as an education service system for children with special needs to study together with other normal children in the same school (Sulasmi & Akrim, 2019).

Children with special needs should receive special attention, especially monitoring their situation in schools in providing learning that they can develop. In providing lesson material according to the ability of children with special needs, teachers must have patience in providing the subject matter carried out so that children with special needs get a better education in learning development. This also causes parents of learners to not be able to monitor their child's development at all times while at home. Parents of learners want to know their child's learning progress in receiving lessons and materials provided by the teacher and know their child has mastered the material. Therefore, a monitoring system is needed by schools to provide an assessment of children's learning and can also easily find out their development with a learning development monitoring system for children with special needs.

Several similar studies related to monitoring the learning development of children with special needs (Lööf et al., 2018) have shown that Anaesthesia-Web offers control to children and allows the use of websites based on interests and abilities. Further Research (LaBate, 2019) created an informative and user-friendly website for other classroom teachers to get resources, ideas, and lesson plans using nature-based learning and technology to help enrich the learning experience in elementary school classrooms. Research on media or methods in the form of BISINDO visualization models in the form of website-based learning videos through the senses of the eyes so that deaf children understand the content of the material so that changes in teething behavior are obtained (Zulkaidah et al., 2022).

Method

Our research used the Agile System Development method to complete the Information System for Monitoring the Development of Children with Special Needs at SLB C YPPLB 2 Makassar. The Agile System Development Method has many advantages, one of which is that clients (SLB C YPPLB 2 Makassar) can participate in software development by providing feedback to the development team during the software creation process.

Figure 1. Agile Software Development

Planning

In the planning stage, researchers collect user data through direct interviews with staff and teachers in schools, this is to find out the needs of users to design a system model using the Use Case Diagram. Based on the results of the interview, information needs were obtained including: (1) The system can display the data of students, teachers, and parents. (2) The system may accurately store old and new child development data. (3) The system can update in real-time any changes to information on data management.

In addition to information needs, software, and hardware needs are also needed for the development of the Information System for Monitoring the Development of Children with Special Needs, the recommended software needs are XAMPP Server, Visual Studio Code, and Google Chrome Browser. Then the recommended hardware specifications need a minimum of 5GB hard drive space and 2GB memory.

Design

At the design stage, researchers describe the Information System for Monitoring the Development of Children with Special Needs, designed through the design of the Use Case Diagram, the Use Case Diagram is very useful for showing the process of activity in order in the system (Aman et al., 2021). In addition, being able to describe business processes can even display the sequence of activities in a process (Iskandar et al., 2022). Here's the Use Case Diagram that has been designed in Figure 2.
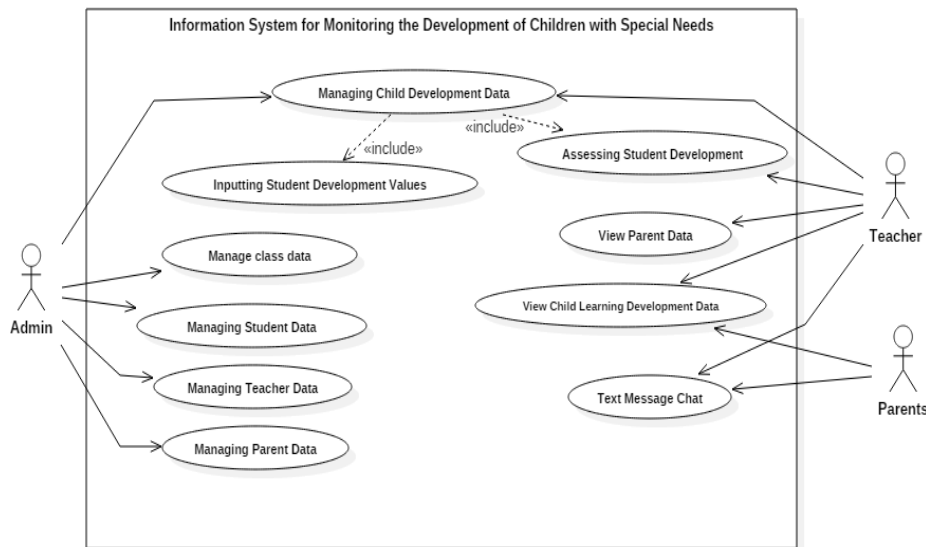

Figure 2. Use Case Diagram

Figure 2 shows the process of Admin, Teacher, and Parents' activities, in order in the Information System for Monitoring the Development of Children with Special Needs. The Admin actor can manage class data, manage student data, manage teacher data, manage child development data, and manage parent data. Then Teacher actors can see the data of the parents, assess the student's development, and see the child's learning development. Then the Parent's actor can see the child's development data and can communicate with the parents on the message chat feature.

Results and Discussion

Result

In the results of this study, we explain the results of system development that has been developed based on system design and then system coding using the Visual Studio Code text editor application written with the PHP programming language, so that the Information System for Monitoring the Development of Children with Special Needs can be used.
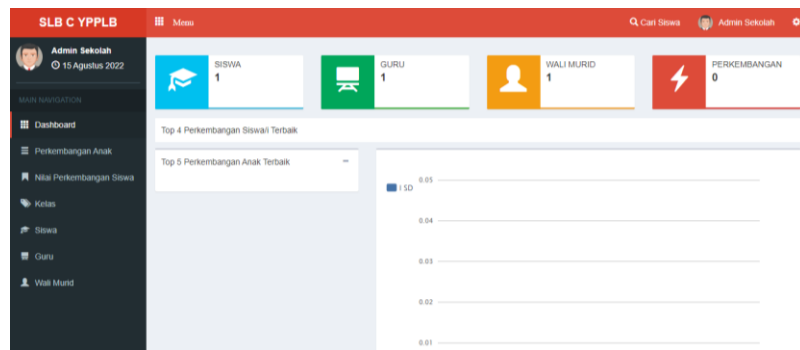
Figure 3. Admin Menu Page.

Figure 3 shows the main menu display of the Admin actor, on the page provides all the features of the Information System for Monitoring the Development of Children with Special Needs that can be accessed by the Admin such as the child development management menu, student development value menu, class data management menu, student data management menu, teacher data management menu, parent data management menu. Admins can also view the amount of data directly from the Dashboard menu.
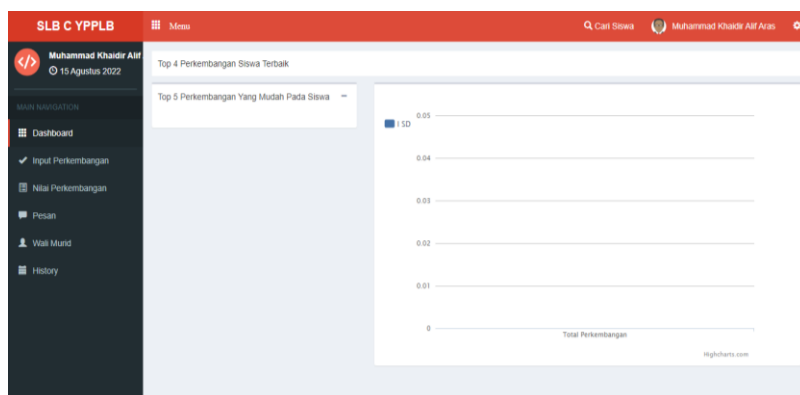

Figure 4. Teacher Menu Page

Figure 4 shows the main menu display of the Teacher actor, on the page provides all the features of the Information System for Monitoring the Development of Children with Special Needs that can be accessed by the Teacher such as the student development value input menu, viewing the student development data value menu, viewing the student data menu, child development management menu, and message chat menu to communicate with students' parents.
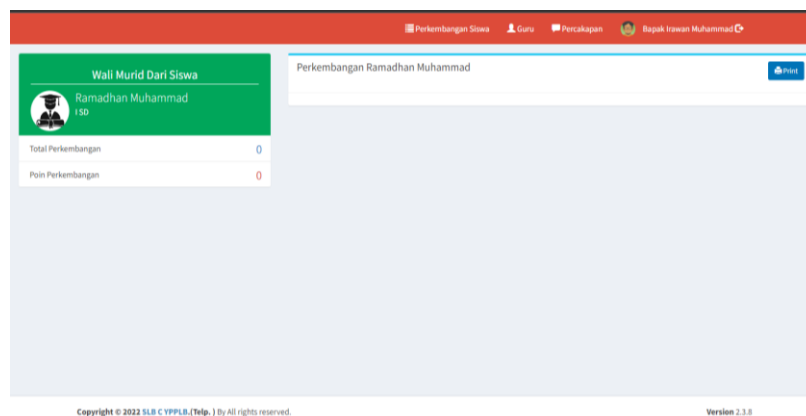

Figure 5. Parents Menu Page

Figure 5 shows the main menu display of the Student Parent actor, on the page provides all the features of the Information System for Monitoring the Development of Children with Special Needs that can be accessed by parents of students including a menu to see their child's learning development, see the results of learning values that have been obtained by their children and a message chat menu so that they can communicate with the teacher.

System Testing

Testing the development monitoring system of children with special needs aims to ensure that software or system design built in the form of a website application is used in this study. In the design of software using special functions. The resulting output is expected to correspond to the given data. With the testing on the system made, it can find out the functions and errors that occur can be known through the test.

Table 1. Functional Testing.

Tested features	Test Scenarios	Expected results	Test Results
The Value of Learner Development	View all Learners' progress	Can print all student developments	Accepted
Categories Developments	View progression categories	Display a menu of student progression categories	Accepted
Value	Assessing child development	Displaying Child Development Values	Accepted
Class	Display classes on Learners	Class menu	Accepted
Student	View Student data	Student menu	Accepted
Teacher	View teacher data	Teacher menu	Accepted
Parents of Students	View student parent data	Student parent menu	Accepted
Student learning progress input	Inputting children's development	Development Input Display	Accepted
Student Development Values	See the value of the weight of development and coaching	Display of student progression values	Accepted
Message Chat	Have a direct conversation with parents	Message menu display	Accepted

Discussion

Children with special needs are children who experience developmental delays, have a medical condition, psychiatric condition, or certain congenital conditions (Marino et al., 2012). They need special attention and handling to reach their potential (Dhiman et al., 2020). The role of information technology can improve the quality of education through an information system to monitor the development of children with special needs, making it easier for parents to know the development of their children's learning process (Husain et al., 2020).

Conclusions and Suggestions

Conclusions

The website-based monitoring system for the development of children with special needs at SLB C YPPLB 2 Makassar received a review of the use of the system from 30 respondents. Based on the results of using the system for respondents, it is known that the application that has been developed is very feasible to use. So it is hoped that the system can be used optimally so that it can benefit schools, teachers, students, and parents of students.

Suggestions

In the development of this system, the author is aware that there are still shortcomings in the system being built. So, the author gives some advice, namely: before using the system is implemented, it is better to give instructions and training on how to use it to the user so that the system can be used optimally. Then it is hoped that in the future the development monitoring system for children with special needs can be added automatically.

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