

Web-based System for Preschool Children's Academic Performance

Nor Iadah Yusop^{1*}, Chai Jie Sheng¹, Mohamed Ali Saip¹,
Adiyati Mohd Nor²

¹School of Computing, Universiti Utara Malaysia, 06010 UUM Sintok, Kedah, MALAYSIA

²Berkat Tasneem Sdn. Bhd., Bandar Darulaman, 06000 Jitra, Kedah, MALAYSIA

*Corresponding Author Designation

DOI: <https://doi.org/10.30880/mari.2023.04.01.025>

Received 15 October 2022; Accepted 30 November 2022; Available online 15 January 2023

Abstract : Most preschools currently manually record children's academic performances and this is not efficient as it is time-consuming and costly. In line with this, a system for preschool children's academic performance can be a solution to such a problem. Hence the Web-based System for Preschool Children's Academic Performance (PCP-WBS) was developed to facilitate the teachers in managing the children's academic performance records. Therefore, PCP-WBS wanted to provide the respective kindergarten with an online management mechanism to improve traditional and physical methods of managing preschool children's academic performance records. A Rapid Application Development (RAD) methodology was employed to develop the system. PCP-WBS is meant to facilitate the respective preschool teachers to record and manage the children's academic performance. In addition, it also allows the parents to view and provide feedback on their respective children's performance. Usability testing was conducted on the system. Though the PCP-WBS works as intended, some suggestions were also provided by the respondents, particularly for a better user experience.

Keywords: Preschool Education, Preschool Academic Performance, Academic Performance System

1. Introduction

Given that it is the first formal education that children receive, Malaysia urgently needs to improve the quality of pre-primary education [1]. Therefore, the quality of preschool instruction will have a big impact on children's behavior and learning preferences in the future. Numerous factors have an impact on how well preschoolers are educated. One of the variables is the educational content and the teachers. The most significant influences on educational quality are teachers. Every day, teachers must evaluate the resources required to complete the programme, and every week or month, they must record the success of the preschoolers. In order to provide teachers more time to prepare for their lessons, it is

*Corresponding author: noriadah@uum.edu.my

2023 UTHM Publisher. All rights reserved.

publisher.uthm.edu.my/periodicals/index.php/mari

crucial to cut back on or decrease the amount of time spent recording children's performance. For the preschool's management, the challenge is greater if it has more than one preschool to be managed. Hence a centralized web-based system is a viable option to allow the preschool's management to manage, track, and monitor each school's students and its students' academic performances. In line with this, the Web-based System for Preschool Children's Academic Performance (PCP-WBS) was developed.

PCP-WBS was developed for an organization called BT¹ that owns a few preschool branches. Each preschool branch is located at different strategic places, but it adopts the same preschool curriculum [2]. BT has to foresee and monitor the performance of each preschool to maintain the quality of the preschool education provided by BT. Nevertheless, BT does not have a web-based system for tracking and viewing student performance and has been doing it manually. This makes it difficult for BT to maintain consistency in an effort to ensure all the branches' compliance with the preschool curriculum standards employed by BT. However, this is the indirect benefit that BT could gain from using the system. For teachers, PCP-WBS allows them to evaluate and record each student's academic performance for the registered subjects. The rubrics for the evaluation are based on the preschool's curriculum standards [2-4]. As important stakeholders in early childhood education, parents can view, track and monitor their respective children's academic performance at their convenience anytime, anywhere. They could provide feedback on their children's academic performances as PCP-WBS allows them to do so. The teachers could use the feedback to reflect on their teaching and take appropriate action shall the needs arise.

2. Methods

PCP-WBS was developed using Rapid Application Development (RAD). Rapid application development (RAD) allows the development of higher quality products faster through - Requirements gathering, performing early prototyping, and iterative design testing to build prototypes quickly [5]. It also helps to focus on speed and development time compared to other models.

The development begins with the requirements planning phase. At this stage, its purpose is to set and gather the client's vision for the product and agree with the client on the requirements to meet that vision. During this phase, project goals and expectations are identified. The actual development starts after the customer requirement is received and an agreement is made. Model-based prototypes are fully transformed and constructed using user requirements and feedback received during the requirements planning process. In order to make sure that the requirements at this point are pertinent to the project, the user design is developed through numerous prototype iterations. Finally, during the handover phase of the final RAD development phase, the PCP-WBS was presented to the stakeholder to review all previously completed phases.

Interface models and database designs are created using methods like storyboarding and Unified Modeling Language (UML) models for systems analysis and design. During the quick construction phase, Visual Studio Code was used to develop the PCP-WBS. The system is connected to a database that carefully stores all important data pertaining to the PCP-WBS. These include preschoolers' personal details, their academic performances, and their parents' information. User testing and documentation have been completed during the cutover phase.

3. Results and Discussion

The PCP-WBS has been successfully developed. **Figures 1 – 5** shows the main interfaces of the system. Hence, preschool teachers and parents can use the system to record and view the respective

¹ BT represents an organization whose main business is to provide Islamic-based preschool education. It employs a preschool curriculum standards set by the Malaysian government.

children’s performance using the system. It was developed as a dashboard that facilitates the respective users to maneuver and navigate through the system to obtain the right information.

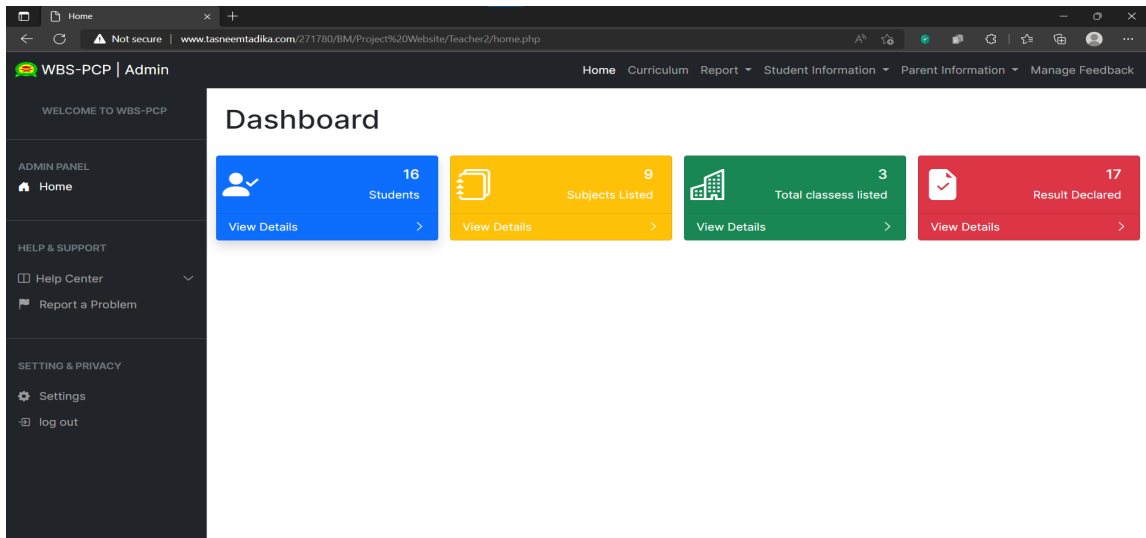


Figure 1: The Interface for Teacher Home Page

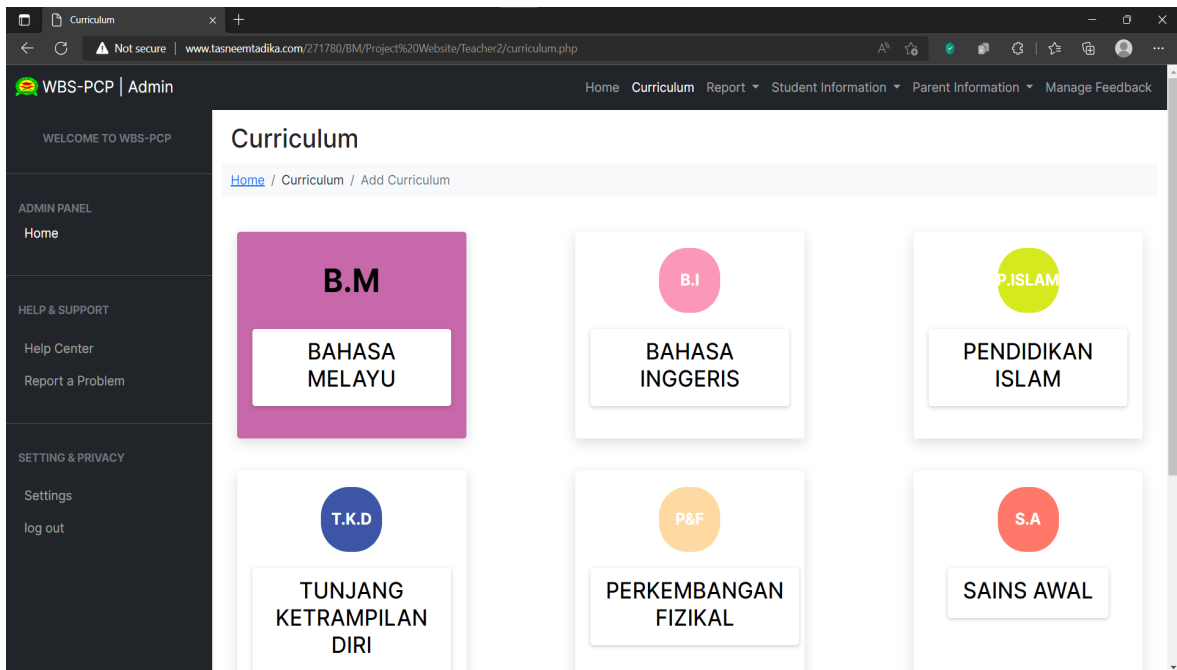


Figure 2: Curriculum Interface

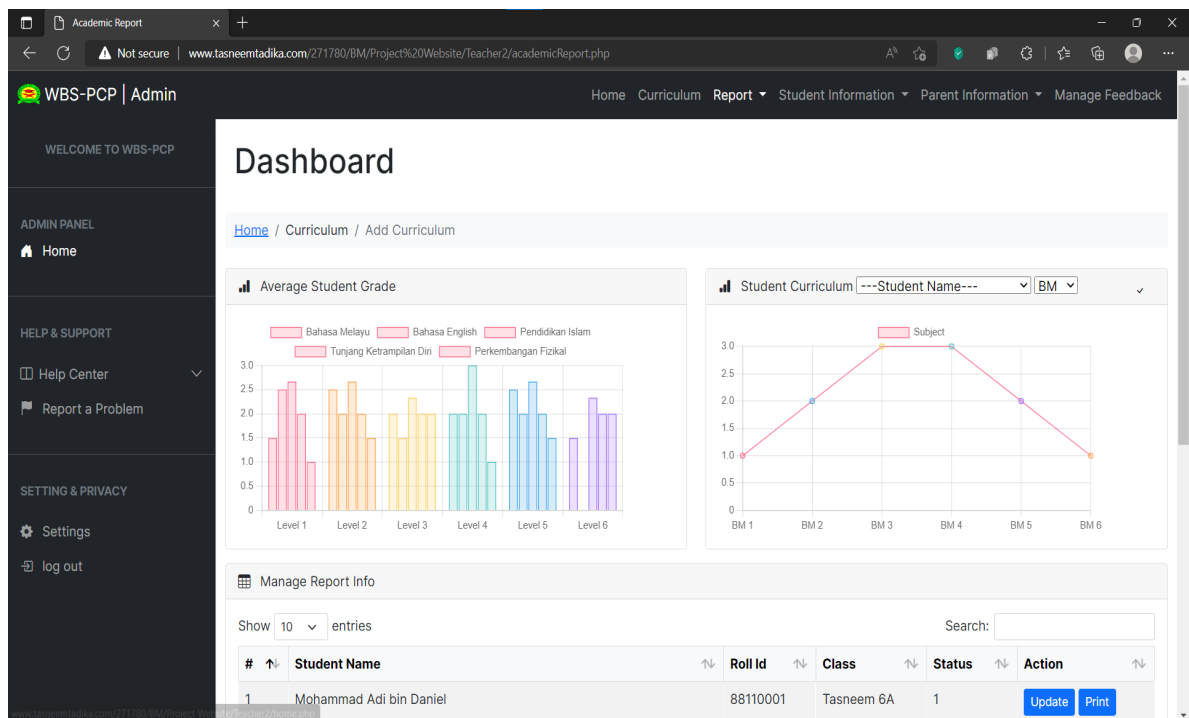


Figure 3: Report page

Figure 1 is the teacher's login homepage, which can briefly introduce the number of students, subjects, results, and classes. Figure 2 is the page where children's curriculum is recorded by subject, and Figure 3 is the report page where teachers can view overall grades for the course and grades for specific students. Figure 4 is the parent login homepage. Parents can choose the year their child belongs to register, or they can go back to previous years' performances.

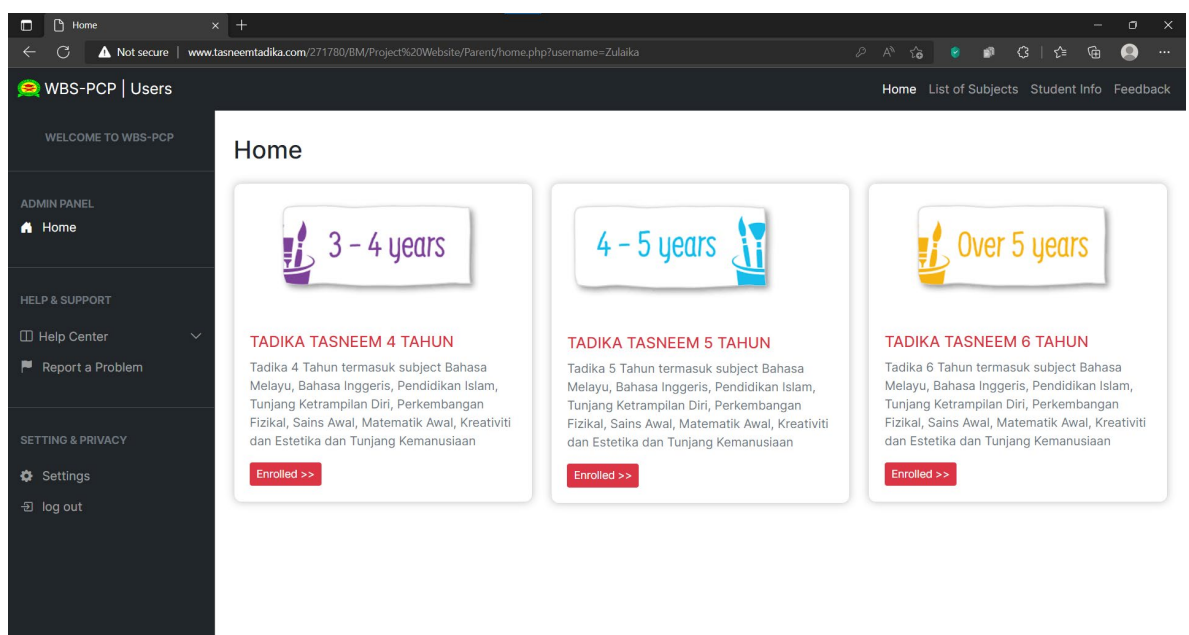


Figure 4: Interface for Parents Page

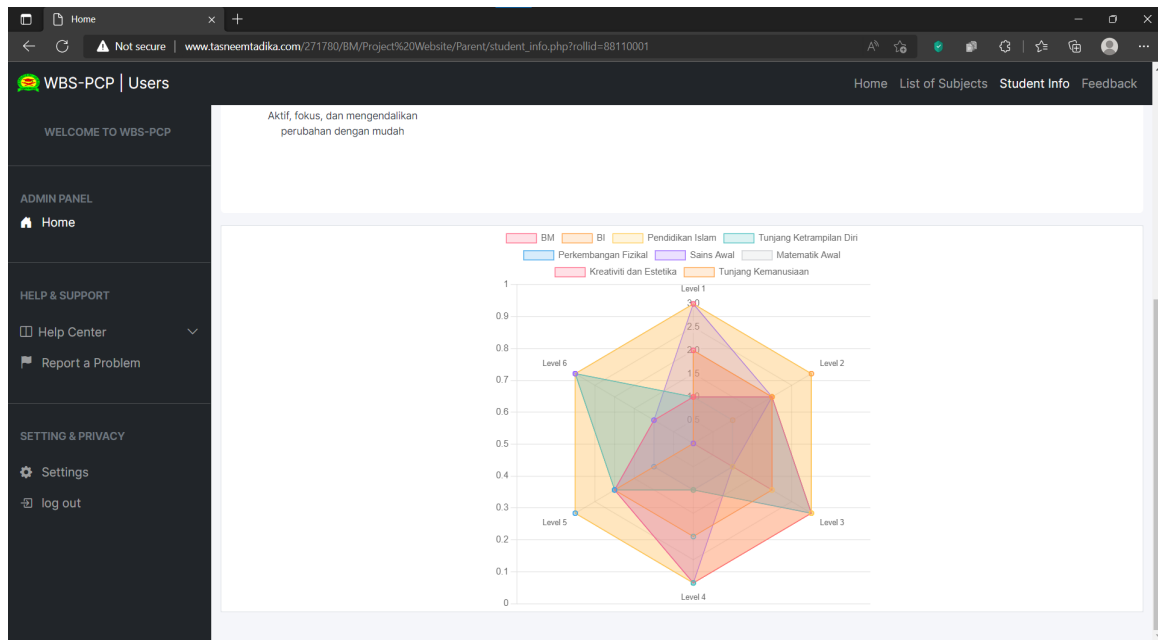


Figure 5: Students’ Performance Page

Figure 5 is an interactive spider-web or radar chart on the subjects taken by each student. The respective parents can quickly and intuitively their children’s academic performance in each subject and overall performance. The developed interface is user-friendly and consists of interactive graphs and buttons that enable users with or without a programming background to perform the analysis. Therefore, teachers and parents can easily and independently explore using the system.

The usability testing on PCP-WBS was conducted in which 30 respondents were voluntarily involved. Of the 30, 23 of which are parents and seven are teachers. Internet-based and in-person recruitment methods were used to find respondents, all of whom voluntarily agreed to take part in the study. All respondents were asked to use the system prior to answering the survey questions. The questionnaire was designed to gather information related to the respondents’ demography and to gauge respondents' impressions of PCP-WBS. The responses on those were gathered using a five-point Likert scale.

In general, 60% of respondents are women and 40% are men. In addition to this, 50% of respondents are aged between 23 and 27 years old. Rural respondents accounted for 76.67% of the total, while urban respondents accounted for 23.33%. Nearly 47.00% of the respondents had a positive experience in managing or viewing student performance.

4. Conclusion

This paper presented the development of PCP-WBS that is convenient for both parents and teachers. This system tried to utilize the advantages of a web-based system to replace the traditional paper-based method. It also gives opportunities to the parent to know how their child performs in preschool and lets them keep track of their child. As the current PCP-WBS focus on 6-year-old students, further enhancement should include other years, that are four- and five-year-olds. The system also needs to improve its security by enabling two-factor authentication and others security functions to better protect user information.

Acknowledgment

This work was supported by the UUM Research Acculturation Grant (S/O Code: 21208, 2021).

References

- [1] M. N. L. Y. Abdullah and A. C. Abdullah, "Preschool Teachers' Training and Attitudes towards Multicultural Education in Malaysia," *International Journal of Early Childhood Education Care*, vol. 7, pp. 1-13, 2018.
- [2] Malaysian Qualifications Agency, Programme Standards: Early Childhood Education. [Online] Available: <https://www2.mqa.gov.my/qad/garispanduan/PS%20Early%20Childhood%20Education%20BI.pdf> [Accessed Dec. 15, 2022]
- [3] Early Childhood Care & Education (ECCE) in Malaysia at a Glance (for newborns to 6-year-olds). [Online] Available: https://www.schoolmalaysia.com/resources/education_system.php. [Accessed Dec. 15, 2022]
- [4] Mariani Md Nor, Education 2030 National Priorities and Challenges in Education 2030: Trend and Issues in ECE, Universiti Malaya, Malaysia. [Online] Available: <https://www.moe.gov.my/menumedia/media-cetak/penerbitan/rujukan-akademik/1447-plenary-3-ap-dr-mariani-md-nor/file>. [Accessed Dec. 15, 2022]
- [5] KissFlow, Rapid Application Development (RAD) Model: An Ultimate Guide For App Developers in 2022, 2022. [Online] Available: <https://kissflow.com/application-development/rad/rapid-application-development/>. [Accessed Dec. 15, 2022]