Decision Support Application to Assist Teachers in Managing Teaching and Learning Activities to Target Students

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ABSTRACT

This project is an application designed to as a tool to assist teachers to do simple analysis on students' test scores data. The application enables the teachers to access student's test score data from Microsoft Access database files. Teachers can then group students according test grades achievement, compare two consecutive test scores and generate simple graphs based on the data. The application is then developed on common user requirements with respect to students' tests scores. The application developed works successfully within certain limitations. The application is easy to use and could be handled by a teacher familiar with Windows environment.

ABSTRAK

Projek ini adalah sebuah aplikasi yang direka sebagai alat yang membantu para guru menjalankan analisa mudah terhadap markah ujian murid. Aplikasi ini membolehkan guru mendapatkan maklumat daripada fail yang disimpan atau dihasilkan dengan menggunakan Microsoft Access. Guru kemudiannya boleh mengumpulkan murid berdasarkan gred ujian, membuat perbandingan markah antara dua ujian yang berturutan dan menghasilkan carta mudah bagi data yang dianalisa. Aplikasi ini telah berfungsi dengan baik pada had yang tertentu. Aplikasi ini mudah digunakan oleh para guru yang selesa menggunakan aplikasi berasaskan Windows.

Table of Contents

List of Figures

Chapter 1
Introduction

1.1 Background

Schools in Malaysia have an extensive record keeping procedure. These range from administrative files such as inventories and financial transactions to student enrolment and test scores. Student records are filed into the attendance registry, the 001-002 cards and student registration book (Omar Haji Ashaari, 1999). These records in most schools are still maintained manually through the paper filing or record book systems. In 1996, the Ministry of Education launched the Smart School Concept using technology as an enabler where the management information system is one of its components. The Student Affairs component, one of the modules of the information system is to handle student records as well as other matters pertaining to students such as registration, student's attendance and automated fee collection capability. As of 1999, out of the 90 schools designated for the Smart School pilot projects, 87 of them are now fully functional (MDEC, 2007). The follow up to this project is the conversion of all government maintained school to Smart Schools is now currently under planning.

Student test and examination scores are also among the data that is recorded, mainly in the form of the school report card (for non-smart schools) or the student database (for smart schools). These data are used to gauge

the students' academic performance. This is made evident by the publishing statistics of the PMR (Penilaian Menengah Rendah) and the SPM (Sijil Pelajaran Malaysia) every year in the media. By monitoring students test scores, teachers can plan intervention steps to be taken to ensure their students can improve their academic performance.

1.2 Problem Statement

Quantitative assessment of students' academic performance is usually done through exercise, quizzes, monthly which are formative assessments and semester examinations, the summative assessments. Most teachers monitor their students by looking at their student's monthly tests and final term examinations. Without the help of computers, teachers can identify students who are performing below average and students who have failed tests and intervene by having remedial classes, hoping that these students will improve. The excellent and above average students are encouraged with more challenging activity.

Although teaching is their main responsibility, teachers are also involved in other activities, such class administrative paperwork (as mentioned earlier) and school committees. This does not include ad-hoc work when schools have functions such as school sports day. The workload teachers have consume most of the teacher's time, sometimes putting off the task of identifying students with difficulties until it is too late.

A school implementing a school Management Information Systems (MIS) allows for better record keeping but is limited to its main function of storing records. Teachers can obtained the information they want by maybe using the query functions available in the system, but it is most likely that they are not familiar with the query syntax. They might also not have free access to the system due to the school policy or lack of hardware.

At the same time, not all teachers are aware of what the reports generated by system is telling them. They might not know what to look for. They might also not have the time to analyse their student test results further. Teachers with some knowledge of spreadsheets are able to generate analysis of their student results but usually do not have the time to do so. When they manage to identify the student groups and carry out the intervention, they have no way of monitoring whether the steps taken have succeeded or failed in improving the students' standing.

Cost and availability are other factors which discourages the use of additional information systems in schools. Due to the relatively small size of classroom and form data, it is not economic to purchase off the shelf analysis tool for use.

Based on these observations while serving as a general science and chemistry teacher in Maktab Rendah Sains MARA (MRSM), there is a need to develop an application which will assist teachers identify students according to their academic performance and plan suitable teaching and

learning activities for them. The application should simplify and shorten the time of analysing students' test data.

1.3 Objectives

This project aims to develop a decision support tool or application with the following functions:

- access existing database file and analyse student test score
- group students according to their test grades.
- analyse trends in students' performance by comparing students' test scores.

The analysis is done using criteria provided by the user. The application will also provide some means of generating charts for visual presentation.

1.4 Project Scope and Limitations

All government schools in Malaysia receive allocation from the Ministry of Education for the procurement of computers. Among the current prerequisite is that computers procured have the windows operating systems and Microsoft Office installed. The application is developed to utilise Microsoft access database which contains the student test score data and Microsoft Excel as a graph generator. It is presumed that teachers have limited access to these files, that is, they can only view the classes they teach.

The application is also meant to be used as an ad-hoc analysis tool for analysing students test score data per semester. It does not have the

capability to analyse continuous student test score data such as analysing test score and comparing results between two semesters or between two academic years.

1.5 Project Significance

The application aims to help teachers and schools in planning for suitable activities to fit the needs of the target students. This allows schools to schedule intervention activities based on the number of students to the number of teachers needed for these students. For example, teachers who are good at tutoring very weak students in a subject can be allocated to the targeted weak students. The system will also allow the school to budget funds for academic activities such as motivation courses and enrichment programs effectively as the actual number of students that requires such programs can be obtained. Teachers will be able to have an understanding on how their class is performing based on graphs generated by the application. It will assist teachers in improving students' academic performance with suitable intervention.

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