

# E-Learning Management System for Secondary School in Malaysia

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## *Abstract*

*With the advancement of Information Communication Technology in Malaysia, teachers should take advantage to upgrade their teaching techniques. Students should be allowed to learn anytime, anywhere and at their own pace. Teachers should be able to keep a collection of test/tutorial questions online. Teachers from different schools should be able to share resources and exchange ideas through the internet. The motivation for this research is to solve the shortage of online resources for students and high student-teacher ratio. With regards to the above problems, we developed a prototype system called E-Learning Management System (ELMS). This software is a web based application software hence it is accessible through the internet anytime and can be used by different schools concurrently. The central process, database and knowledge base will be maintained by a system administrator at a central location. Teachers can also access the system anywhere and at anytime. Teachers can monitor student's performance easily through the test/tutorial results analysis done by the system and the system will provide some advice to the students based on their results. We conclude by presenting several modules built in the system.*

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## 1.0 Introduction

The challenge of e-learning initially is framed for teachers to take advantage of internet revolution in human communication and resource sharing. Students today expect much more than online access to course materials. They expect online access to both academic and administrative services on the web presenting a personalized point of contact for students and instructors.

Learning Management Software (LMS) is a software tools to support the delivery and management of learning. With the advancement of Information Communication Technology in Malaysia, LMS will be able to support teaching in Secondary Schools.

### 1.1 LMS Modules

LMS software solution has been categorized into eight major modules(A guide to Learning management systems)

- 1) Student Management and Reporting. This module manages other administrator and/or students into logical group, and to track and report on students' progress and activity.
- 2) Learning Event and Resources Management and Reporting: This module allows system administrator to logically organize courses and events, to provide courses to students through the uses of access rights and registrations, and to manage all class-related resources including classrooms and instructors. This module acts as an interface between the system administrator and students and it also reports students' activities.
- 3) Online Course Delivery Infrastructure. This module allows user to set up the courses to be taught online. This includes details of syllabus and the prerequisites for course delivery.
- 4) Course Authoring Tools: This tool allows user to create new course materials.
- 5) Skill/Competency Assessment. This module analyses students' results in order to counsel them and to help instructors design a personal teaching path for the individual student.
- 6) Professional Development Management: This module allows tracking students future professional development.
- 7) Knowledge Bases: Allow LMS to integrate specific learning references or to access external learning references as a supplement to the core set of online courses.
- 8) Learner Centric and Organization Personalization: This module will identify a student by a student's profile, and deliver targeted courses, news, references, and other information.

Beyond the features and functions of an LMS, there are additional characteristics crucial to the LMS environment. These characteristics dictate hardware and operating system requirements, the required level maintenance, the extent to which the LMS can be integrated with other systems, and the degree of security and reliability that can be expected.

- 1) Internet Hosted LMS<sup>c</sup> vs locally deployed LMS: A hosted LMS is accessed from an Application Service Provider (ASP) through the internet, as opposed to being installed on local hardware. An internet hosted LMS lowers the users' cost for both hardware and software, allows content and feature updates with no local intervention and promotes faster implementation.
- 2) Integration of LMS with other system. It may be advantageous for LMS to share data files with other management systems.
- 3) Degree of Security: Any LMS must protect and keep secure students' data and propriety content. A good system will utilize ids and passwords at various levels, encryption key, and IP address restrictions.

## 2.0 ELMS for Secondary Schools in Malaysia.

ELMS for secondary schools in Malaysia is a Web-Based application that supports the learning process in various secondary schools in Malaysia. The general benefit of Web-Based training when compared to traditional instructor led training includes all those shared by other types of technology-based training. These benefits are the training is usually self paced, highly interactive and high retention rate.

Access is available anytime, anywhere around the globe. Students always have access to a potentially huge library of training and information whether they are working from home or other places when they travel. Students in rural areas where computers and internet are not easily available can depend on the facilities provided by the government to the schools.(Munirah G., Nur'aini A. R., Zurinahni Z, Abdullah E 1997a)

Per-student equipment cost is affordable. Almost any computer equipped with a modem and free browser software can access the internet or a private intranet. The cost of set up is relatively low.

Students' tracking is made easy because students complete their training while they are connected to the network. It is easy to implement a student tracking system. The information can be how long they spent on particular topics, are they revising regularly, their assessments score and others.

Content is easily updated. This is perhaps the most useful of ELSM. Teachers can easily update, delete and maintain the information any time. Students will always have the latest information.

There are several objectives that we would like to achieve when we first developed ELMS . We would like to create an interesting environment for both the teachers and the students. The teachers would have a systematic way of teaching where they can always update and change their teaching material at anytime accordingly. The student would always be presented with the latest technology and they can always learn in a conducive environment.

This system will also be a resource centre for notes, tutorials questions, test questions and exam questions. Traditionally, schools will compare notes, exam questions and tutorials among them and they can adopt the best for ir students. They need to have contact person in every school and this is sometimes time consuming. Since time is the limitation, they couldn't get all the materials at their disposal on time and this sometimes can be frustrating. Through the system, all the schools involved will share notes and exam questions. The materials can be accessed as soon as it's being load to the system by the owner.

Since this is a Web-based system, it inherits all the benefits of a web based training. It provides the learning and teaching environment for teachers and students around the clock. Students can use it anytime after traditional schools hours or even during interval to do revisions or send e-mail to teachers. Teachers won't be available all the time even during schools hour so this makes sure that the questions goes to the teachers and won't get lost. Teachers can also update their notes anytime, anywhere and this can be very productive.

In using the system, we hope the student will learn to be more independent in creating their own learning steps. The system will guide them systematically but at the same time gives the students freedom to learn at their own pace without having to compete with other students. This will definitely help the slow learners from being frustrated and the fast learner from getting bored.

Workload among teachers in secondary schools in Malaysia is quite heavy. They have to cater for both slow leaner and fast learner and at the same time to finish the syllabus given by the Ministry of

Education. They also have to teach even the easy material. We hope the system can take away some of the workload from the teachers. The teachers can create an interesting presentation and kept it on the database on easy material and let the students study it on their own and concentrate more on the harder task. At the same time the student can form study group among themselves with the presence of teachers. The teachers can always monitor the students' progress individually and this can help them in handling individual students.

Lastly we would like to encourage the concepts of sharing among all schools in Malaysia. This will help some of the smaller schools in rural areas. This will also help closing the gap among the weak and the best schools in Malaysia in terms of public examination results.

### 3.0 System Design

Our system is a web based applications that will support secondary schools in Malaysia. This is a hybrid data base system. Each school will have it's own LAN where the server hold databases of students and teachers information. There will be two different databases for students where one will keep the students' personal information and the other will hold the academic information. This academic information will include results for all the quizzes, tests and exams attempted by the students. This information will be used by the analyzer to produce reports.

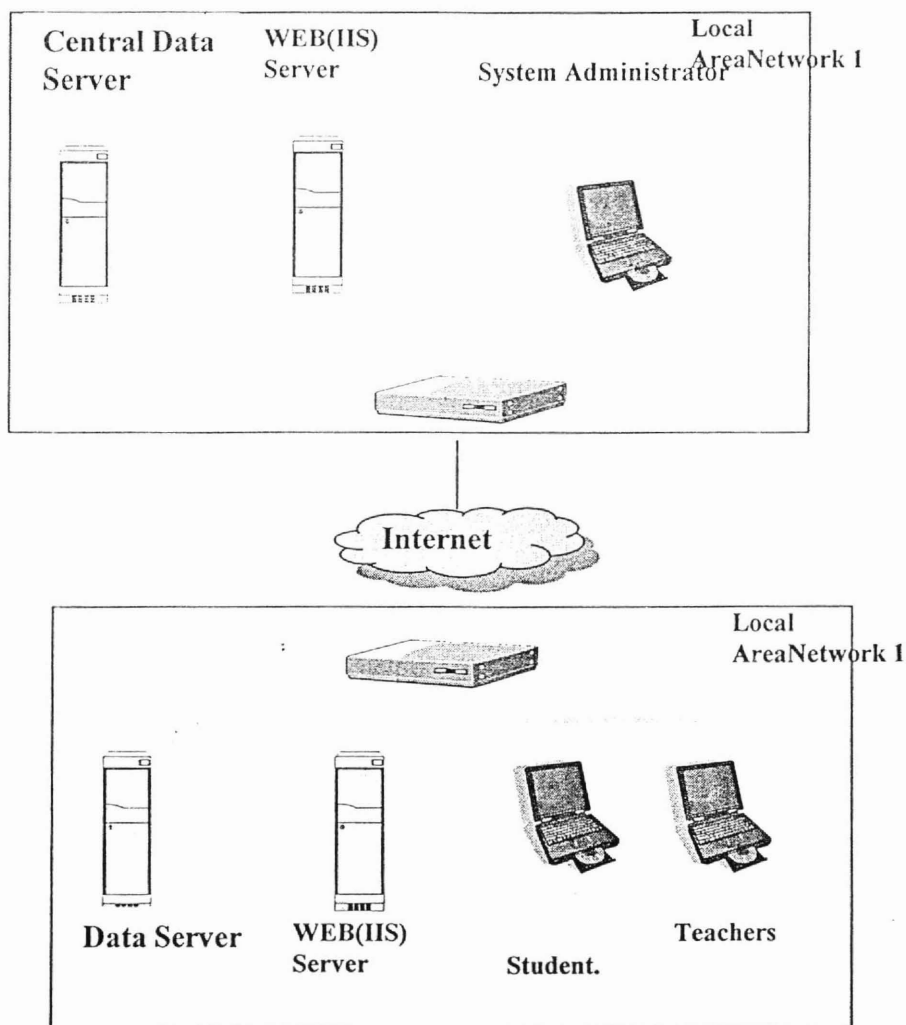


Figure 1: ELMS architecture.

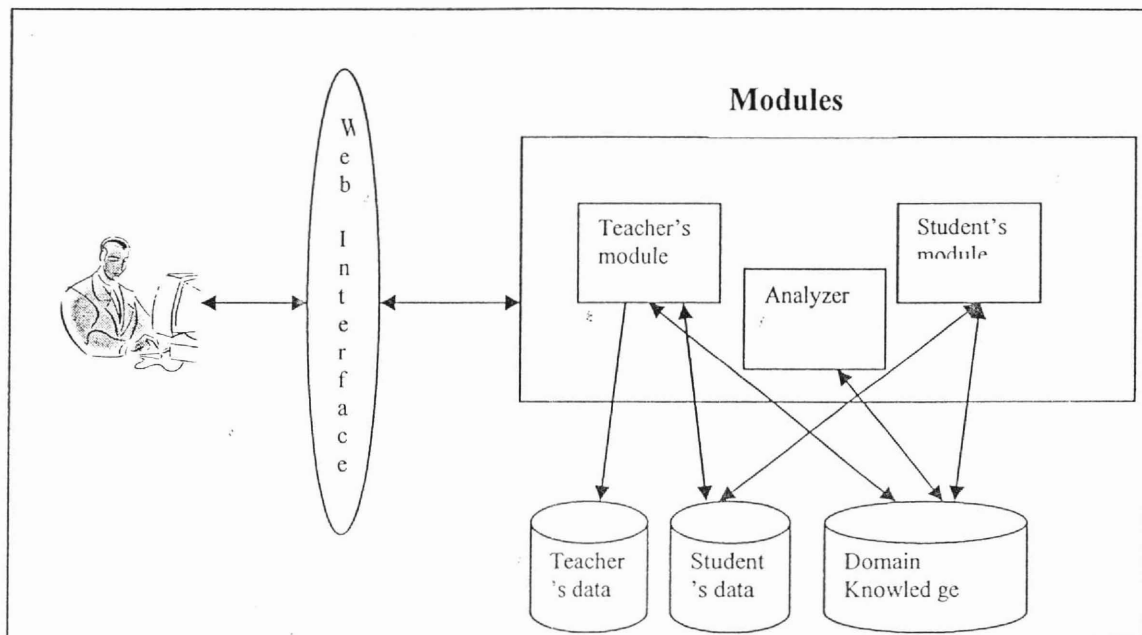


Figure 2: ELMS modules and data

ELMS consists of three main modules [figure 2] (Munirah G, Nur'aini A. R., Zurinahni Z., Abdullah E. & Poh B. G. ,1996) They are teachers module, student module and analyzer module. It also maintains student's database and teachers' database as well as Domain Knowledge. The domain modules will provide templates for all notes and questions in the knowledge base. Teacher's module provides functions for teachers to log into the system, input personal particulars, input and access student's result. The teachers can also access to student's personal particular. It also provides a template for teachers to link their notes, tutorial questions and exam questions. Teachers are divided into three categories. They are class teachers, subject teachers and subject's leader. Class teachers are responsible for a class data. For example the student's overall performance and he/she acts as a counselor. She will use the output from the analyzer module and also some suggestion for the module as a basis to supervise students. Subject teachers are responsible for a subject and all information related to the subject while subject leaders are responsible for the whole syllabus of the subjects (YipPei Pei 2002) (Chow Shioa Yen 2002) (Saw Sooi Chin 2002)

Analyzer module plays an important role in the system. It produces various types of reports in table form and charts such as students' performance either overall or individually, student's weakness reports according to topics, types of questions and also student's guidance report. All this reports will be generated for the users for the references and for the teachers to do analysis. This module randomly chooses the questions from the questions bank according to the criteria given by the teachers. This will be done through a template where teachers decide the number of questions to be asked for each topic, type and shape of questions. The analyzer will use a timer system to control students during exam. This module also marks the exam, stored the answer plus performance result that will be used in the analysis process.

During the analysis process, the module will find the weakness of the students by looking at their answers and their tutorial, tests and exams result. This will help teachers counsel the students. (Munirah G., Nur'aini A. R., Zurinahni Z, Abdullah E 1997a)

The system administrator modules manage the community of lower secondary students. The module acts as a medium between the system and the user. The objectives of the system administrator modules are

1. To manage the user activities.
2. to manage the system securities
3. to manage the system databases.

School administrator module, is needed to register the school as a member. After submitting the schools' information such as school profile , the principle profile, class details, teacher's detail, the system will generates invitation e-mail to the teacher and student involved. After the users sign up, the school can login and access the resources that are available in the system.

The school needs to be a member first before a student can be a part of the system. After receiving invitation e-mail the student needs to input their personal information and submit to the system. Using the user id and password given by the system, the student can logon and access the online material such as class notes, tutorial questions, past year's exam papers and subject details. Students manage their own personal particular, view timetable, view grading standards and view reports on personal performance.

#### 4.0 Implementation

We implement the system using the client architecture. The schools will need its' own LAN with a local server to keep the user applications and databases. The central server will be handled by the ministry of education/State education ministry. The system uses SQL version 7.0 that runs on windows 2000 for the server side.

##### 4.1 ELMS component.

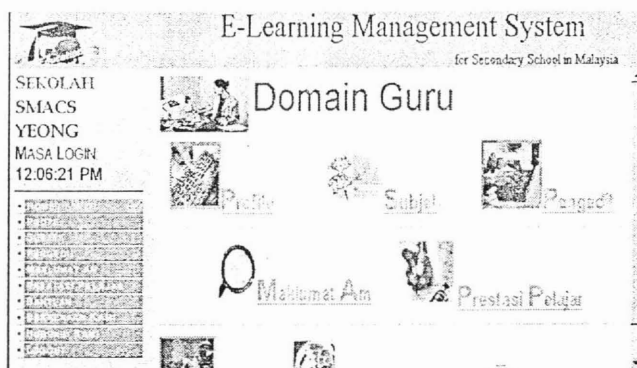


Figure 3 :teachers main Interface.

Figure 3 shows an example of interface for teachers. There are nine different component for the teachers to use. Each teachers have unique user id. The user id will be used to identify their status and which module is allowable. Here they edit can their own profile, view and edit their notes, They can only access to the subject they teach or if they are the subject leader. See Figure 4.

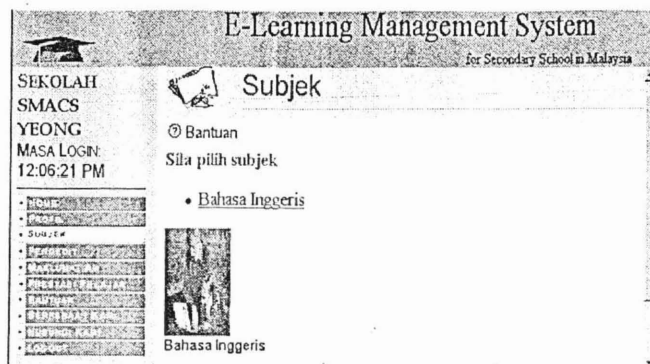


Figure 4 : Teachers' subject

Each subject teacher can see the overall performance by their students.[Figure 5]and [Figure 6]

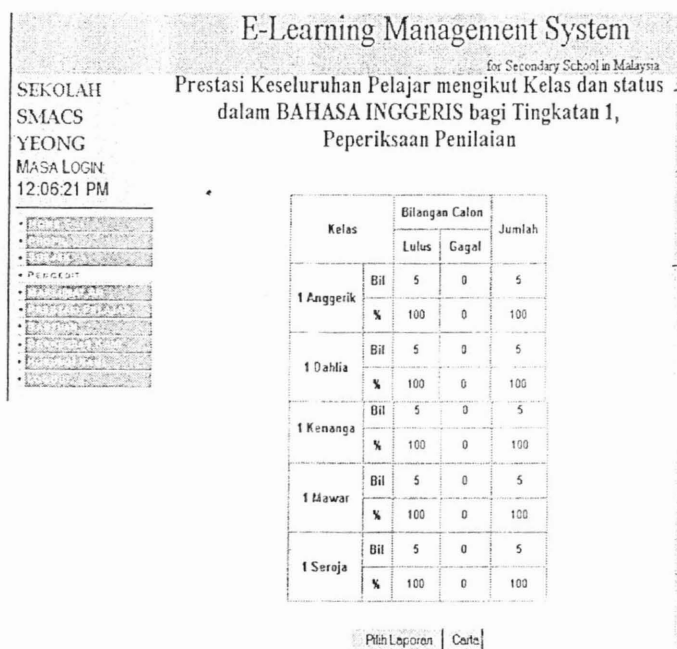


Figure 5: Form one student's performance in English.

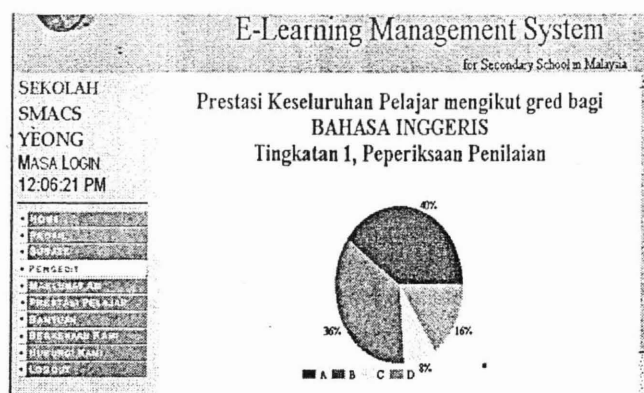


Figure 6: Another view of students' performance



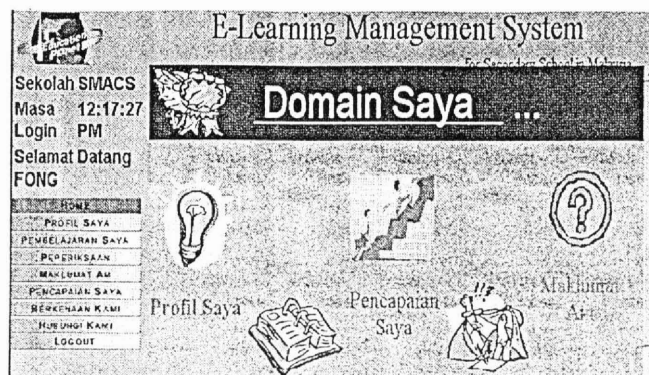


Figure 7: Main interface for students.

Figure 7 shows an example of interface for student. Students have can add their own informations by choosing *Profile Saya*. They can view their own performance ( *Pencapaian Saya*) [Figure 8] , schedule their own learning phase (*Pembelajaran Saya*) [Figure 9].

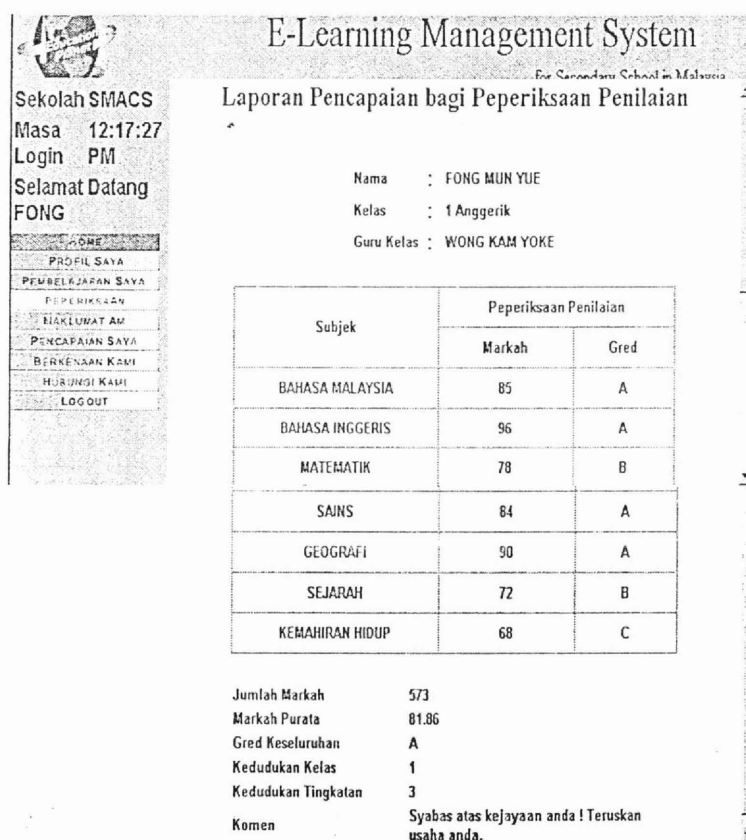


Figure 8 : Individual own performance.



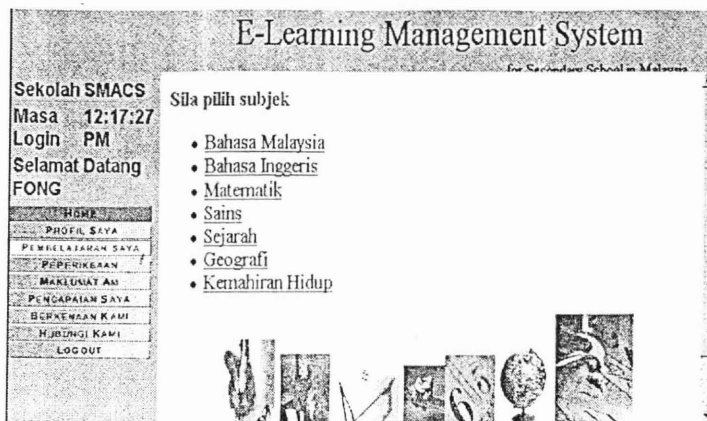


Figure 9: Student Learning Interface.

## 4.2 Tutorial.

Teachers can link their tutorial and notes using an interface prepared for them. Notes can be created using on the market software and then linked to ELMS. We do not have a built-in editor in ELMS. Students can view the notes and try their tutorial through a different interface.

## 4.3 Analysis Support

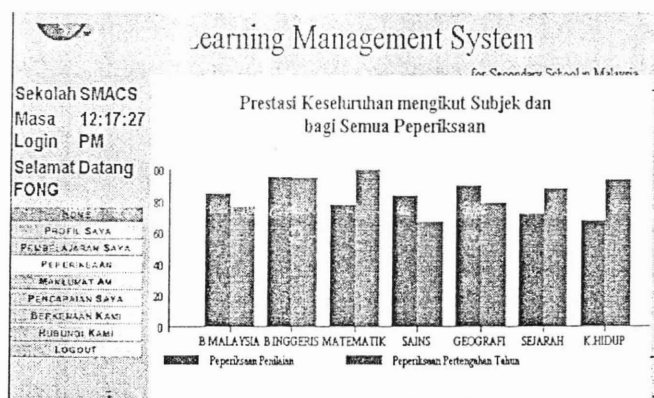


Figure 10: Comparison of individual student in two exams.

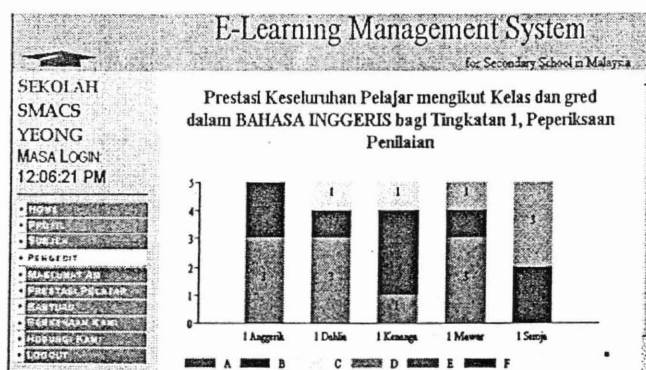


Figure 11: Comparison between classes in English test.

The analyzer will produce various types of reports as shown in Figure 5, Figure 6 , Figure 10 and Figure 11. This reports will be used by the teachers to advice students . The system will also produce a sample report card which the teachers can use as a guide line .

## 5.0 Discussion and Conclusion

Our next step is to test the system in the real school environment. We also would like to transfer to open source platform and rewrite our software in PHP and used My SQL for our database on LINUX operating system. This will help reduced cost which the main hindrance of using such software in national schools in Malaysia.

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