

ONLINE PERSONAL TUTORING SYSTEM (OPTS)

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EXECUTIVE SUMMARY

Nowadays, most of the primary schools in Malaysia are still using courseware such as CD during teaching as a learning material. Students also depend on web based learning programme to study the subject that required them to pay. However, not everybody able to pay for the online educational programme such as Score A programme. Besides that, teachers are not participating in the web based learning application as they not play role to update notes and assessment every time. With the growing of technologies, the situation should be changed. The Online Personal Tutoring System (OPTS) can provide the solution for the above situation. The objective of OPTS is to provide medium for teacher to share learning and teaching material towards providing platform for the for year 4 science students to the current KSSR (KURIKULUM STANDARD SEKOLAH RENDAH) which is based on band system. The OPTS is mainly for science subject at primary school which contain one topic. There are three targeted users in this system which is a single administrator, teacher and student. They are carried out different kind of roles as stated in user requirement. Waterfall model has been chosen as the method to develop this system which is planning, requirement analysis, implementation and testing. This methodology is chosen because it attempts to reduce inherent project risk by breaking a project into smaller segments, provides easy to change during the development process and it is suitable used on developing OPTS. The OPTS is expected to become an educational tutoring aid for pupils and teachers. Moreover, only teacher can participate in OPTS as the teaching material provider.

RINGKASAN EKSEKUTIF

Kini, kebanyakan sekolah rendah di Malaysia masih menggunakan perisian seperti CD sebagai bahan pembelajaran semasa pengajaran. Pelajar juga bergantung kepada program berasaskan web pembelajaran untuk belajar semua subjek yang memerlukan mereka untuk membayar. Walau bagaimanapun, tidak semua orang mampu untuk membayar untuk program online pendidikan seperti program Skor A. Selain itu, guru-guru tidak mengambil bahagian dalam aplikasi berasaskan web pembelajaran kerana mereka tidak memainkan peranan untuk mengemaskini nota dan penilaian setiap masa. Dengan teknologi yang semakin meningkat, keadaan seumpama ini boleh diubah. Online Sistem Tutor Peribadi (OPTS) boleh memberikan penyelesaian bagi situasi di atas. Objektif OPTS adalah untuk menyediakan satu medium untuk guru untuk berkongsi pembelajaran dan bahan-bahan pengajaran selaras menyediakan platform bagi tahun 4 pelajar sains berasaskan system KSSR (STANDARD Kurikulum Sekolah Rendah) yang berdasarkan sistem band. OPTS juga berfokuskan terutamanya mata pelajaran sains di sekolah rendah yang mengandungi satu topik. Terdapat tiga pengguna yang disasarkan dalam sistem ini yang merupakan pentadbir tunggal, guru dan pelajar. Mereka menjalankan pelbagai jenis peranan seperti yang dinyatakan dalam kehendak pengguna. Model air terjun telah dipilih sebagai kaedah untuk membangunkan sistem ini yang merancang, analisis keperluan, pelaksanaan dan ujian. Kaedah ini dipilih kerana ia cuba untuk mengurangkan risiko projek yang sedia ada dengan memecahkan projek ke dalam segmen yang lebih kecil, menyediakan mudah untuk berubah semasa proses pembangunan dan ia sesuai digunakan untuk membangunkan OPTS. OPTS dijangka menjadi bantuan tunjuk ajar

pendidikan untuk murid-murid . Selain itu, guru hanya boleh mengambil bahagian dalam memilih sebagai pembekal bahan pengajaran.

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1.0 INTRODUCTION

1.1 Problem Statement

Nowadays, online personal tutoring system (OPTS) becoming an important teaching and learning material among teachers and students. Usage of courseware such as CDs as a teaching materials are not enough for primary school students to understand certain topics. Students are not exposed fully to the questions on all the subtopic. Students find it difficult to understand the topic and failed to answer the exam questions. Sometimes, students are not getting feedback regarding their mistakes from students unless students go and see their teachers personally. Students take long time to finish the assessment if the teachers give homework for them. There is no proper time limit for the students to finish their assessment. Besides that, students are not much exposed to different kind of questions when they learn in classrooms. Students should use open-ended questions in teaching material to encourage to avoid yes or no answers and to be creative on answering subjective questions. In some online education web application, teacher will not play role to track the performance of their students. Therefore, students also will skip to read will just try the assessment without study the subtopics. This because the application not provided features where teachers can track student's performance by using band system. This way of learning techniques not exposed to the students which make students to attempt the questions without any revision. This situation will make students to not understand the topic very well.

1.2 Purpose

Online Personal Tutoring System (OPTS) is an online shared teaching and learning resources for primary school students. This system is a web based application that will be developed focusing only on life process topic in science subject. OPTS will only limited to the topic on life process chapter. Assessment and teacher's feedback also included in OPTS. The teacher feedback will be based on band system which is regarding current educational KSSR (Kurikulum Standard Sekolah Rendah) system. The band system is embedded in OPTS because it will easy for teacher to track student's performance. When their result in the system it is very easy for teacher to the records of the students understand level. Management of notes and questions will be done by teacher where they will update every time if they want to add any additional studying materials. Students can access to OPTS to 24 hours in a day where there is no restriction to time. Thus, it will be able to develop student's time self-management and independent learning.

1.3 Objective

- i. To provide medium for sharing teaching material for primary school year 4 science students
- ii. To provide platform for year 4 science students to the current KSSR(KURIKULUM STANDARD SEKOLAH RENDAH) which is based on band system
- iii. To manage notes and questions module for primary school science year 4 students for life process topic

1.4 Review of Existing System

Courseware such as CD Existing system for teaching primary school students is discussed here to help in giving ideas during the development of the system. The ideas can be used to create an enhanced system. Advantages and disadvantages of the existing system will be studied to ensure that the new system that developed for primary school students. Now, the applications that we are going to discuss are:

- i. Courseware such as CD as a teaching and learning material
- ii. Webpage education application such as Score A Programme
- iii. Intelligent Tutoring System such as ActiveMath

1.4.1 Courseware such as a Teaching and Learning Material

Normally teachers are more familiar to use courseware like CD to teach the students. Courseware is defined as instructional or educational software and is widely used by school students at primary level and can be used as an integral part in the delivery of their courses. Courseware or multimedia integration into instruction and learning becoming a very effective tool for learning and teaching. (Arif , R, M.et al.,2012) In general, courseware can play the role of a teacher and serves as an interesting tool for students to interact during their learning process. Teachers are more prefer to access to hardware or software to teach students. (Brooks, H. B.et al, 1996). The text of the certain topic was highlighted with different colours and arranged in a pattern that could be easily identified by the students. A survey shows that highlighting text will enable students to understand the topic very well as it shows important points clearly.(Doughty,1991). Teachers also can play a more active role in computer based in classrooms. Students can learn effectively and interestingly by using courseware to study science subject with the guidance from a skilled teacher. Multimedia features such as pictures, video, animations and buttons were included in the courseware to help students to get better understand complex concept in grammar. The usage of interactive multimedia compromise with different kinds of technique such as listening, reciting, and comprehension and authentic learning experiments.(Chen, G.,2008) But nowadays the situation change where teaching involving CDs was not widely practised. At the same time, CDs will create technical problems such as DVDs may be scratched or not compatible with your player.



Figure 1-1: Screenshot software for science Form 3

This courseware was built for the consumption of the Ministry of Education under the PPSM1 project. This Form 3 Science courseware was built to assist teachers to teach the subject in English. The first version of the Flex framework is used in developing this courseware.

1.4.2 Webpage Education Application such as Score A Programme

Nowadays, using webpage education application to teach students become important medium to deliver teaching and learning material. Student can access to this application 24 hours a day and at anywhere. Score A programme is a application where it can introduce the students to the world of IT. Score A Programme has many features which make students feel convenient to use this system. This system consists of 100% according to the syllabus of the Malaysian Ministry of Education. Score A programme complete with up-to-date syllabus, e-topic, e-assessment, e-notes, e-dictionary, instant marking, e-report card and e-past year exam. Assessment also will be carried is based on countdown timer. Students also can choose the assessment based on their level such as easy, medium and expert. But, students need to pay a lot to access to this Score A programme. Each person need to spend RM596.00 to use this system. Therefore some people are unable to buy this system.

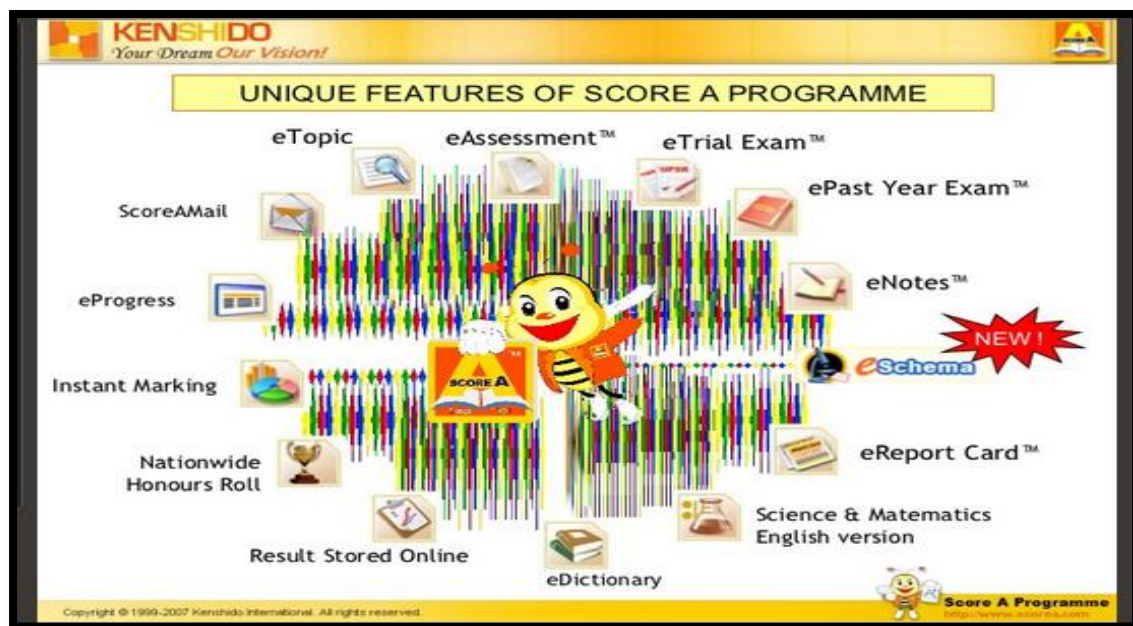


Figure 1-2: Screenshot of Score A Programme

1.4.3 Intelligent Tutoring System such as ActiveMath

Intelligent Tutoring System is the application of AI (Artificial Intelligence) for our education. Last time the development computers influenced the architectures of the ‘intelligent tutoring’ systems. But nowadays it change to sophisticated software systems with this attribute. ITS can be defined as a computer software systems that look for to mimic the methods and dialog of natural human tutors to generate instructional interactions in real time as required by individual students. ITS software tracks student’s performance, feedback and hints from the students. The software can make inferences about strengths and weaknesses, and can suggest additional work by collecting information of student's performance. For a example, ActiveMath is a web-based adaptive learning environment for mathematics which use of artificial intelligence technique in the system. (Melis, E.,et al. ,2011). This system aims for improving long-distance learning, for complementing traditional classroom teaching and for supporting individual and life-long learning. Based on research for ActiveMath has used and developed system by using problem solving, rule-based system, knowledge representation, user modelling, adaptive systems and adaptive hyper media and diagnosis. The pedagogical knowledge is stored in a pedagogical rule base, the educational content is stored in MBase, and the knowledge about the user is stored in the student model in Activemath.

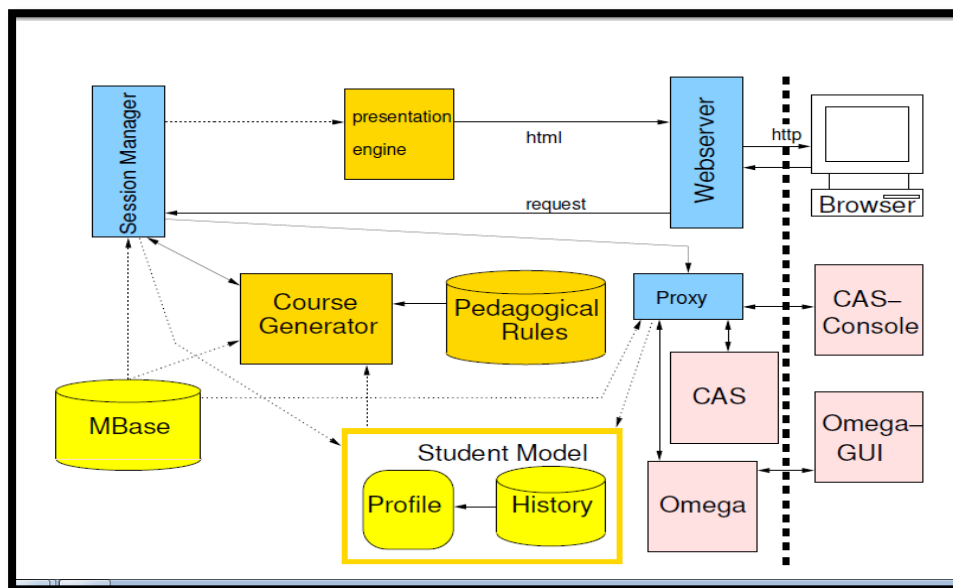


Figure 1-3: Architecture of ITS ActiveMath

1.5 Relationship of Current Project

Table 1-1: Comparison With Current System

Features	Courseware as a teaching material	Score A Programme	Intelligent Tutoring System of ActiveMath	Online Personal Tutoring System(OPTS)
Updates of Notes	No	Yes	Yes	Yes
Availability of assignment	Yes	Yes	Yes	Yes
Involving of intelligent technique	No	No	Yes	No
Instant marking	Yes	Yes	Yes	Yes
Marking assessment by respective teachers	No	No	No	Yes
Performance tracking using band system	No	No	No	Yes

1.6 Current System and its Limitation

The system that will be developed is Online Personal Tutoring System (OPTS). This system consists few convenient features that differ from other application. This application based on online web based application. This idea is developed when a survey show that over 70% of students indicated that they benefit from using technologies in their studies. They prefer to use ICT based educational material for the learning purposes. Usage of technologies in their learning experiences includes usage of courseware by their teachers in the classrooms. This situation enable student to prefer to use technology based medium for their educational purposes. Therefore, using of online based studying material will help student understand the topic in future. (Samuelis, L., 2007) . In order to preserve the teacher-students engagement, OPTS will allow subjective questions. The subjective question will require teacher to access and give some feedback based on band system. Nowadays in primary school, the band system is being used by teacher to evaluate student's performance. This will enable teacher to be convenient to track performance of their students in OPTS and students also will try to attempt the questions once study the topic. In addition, there are respective teacher only can play the role to upload notes and assessment of the science subject. There will be message alert and triggering for teacher only for the unmark assessment. Expected limitation for OPTS to be operational are such as size of server space required for free web hosting, task and responsibilities by single administrator. The quality of the teaching material and teaching materials are not be reviewed by anyone.

1.7 Indications of Scope and Limitations of Study

- i. Single administrator is needed for OPTS because only single administrator is considered to maintain the system for science subject.
- ii. There will be no intelligent approval to become a student or teacher for the module.
- iii. Types of additional learning materials that can be uploaded are limited which students need to download before read.

1.8 Terminology

- i. OPTS – Online Personal Tutoring System
- ii. SDLC – System Development Life Cycle
- iii. AI – Artificial Intelligence
- iv. ITS – Intelligent Tutoring System
- v. IT – Internet Teaching

1.9 Report Outline

This technical report consists of three (3) parts. Part 1 will discuss the introduction to system. Part 2 will review about report body and Part 3 will be the conclusion of this report.

2.0 REPORT BODY

2.1 User Requirement

OPTS will be developed based on the user requirements. 15 user requirements considered as a feature which should included in OPTS. The stakeholder of OPTS is 2 science teacher and 10 students from Sekolah Kebangsaan Setapak Indah. The user requirement are listed as below in Table 2.1.

Table 2-1: List of User Requirement

No	Description
R1	Administration of student and teachers by system admin where admin can insert, edit and delete the administration of system user.
R2	Administration registration should consists of full name, my kad, address 1, address 2, postcode, state, phone number, email address and user name.
R3	Teachers registration should consists of full name, user name, my kad, gender, experience, address 1, address 2, postcode, state, phone number, email address.
R4	Students registration should consist of full name, username my kid number, gender, address 1, address 2, postcode, state, phone, email address.
R5	Administrator can view the details of the teacher and students by enter their user id. The details of each user will display.
R6	Band system application is provided in OPTS. This application will allow teacher to insert the band for the students after mark the subjective questions.

R7	Band system enable student to attempt the questions after read the notes.
R8	The system can upload learning additional item by teachers.
R9	The system also must provide with different types of questions done by teacher. There are multiple choice question and subjective question.
R10	Teacher can mark the subjective questions for the students.
R11	Students will get the feedback from teacher for specify subjective question in the band form which are from band 1 to band 6.
R12	The system provided message alert for teacher for the unmarked assessment.
R13	Assessment by student is consists several elements such as view question, attempt question.
R14	Result can be viewed by the student.
R15	Students learn the module by view the picture of the process of any topic.

2.2 Flow Chart/Context Diagram/DFD Level 1

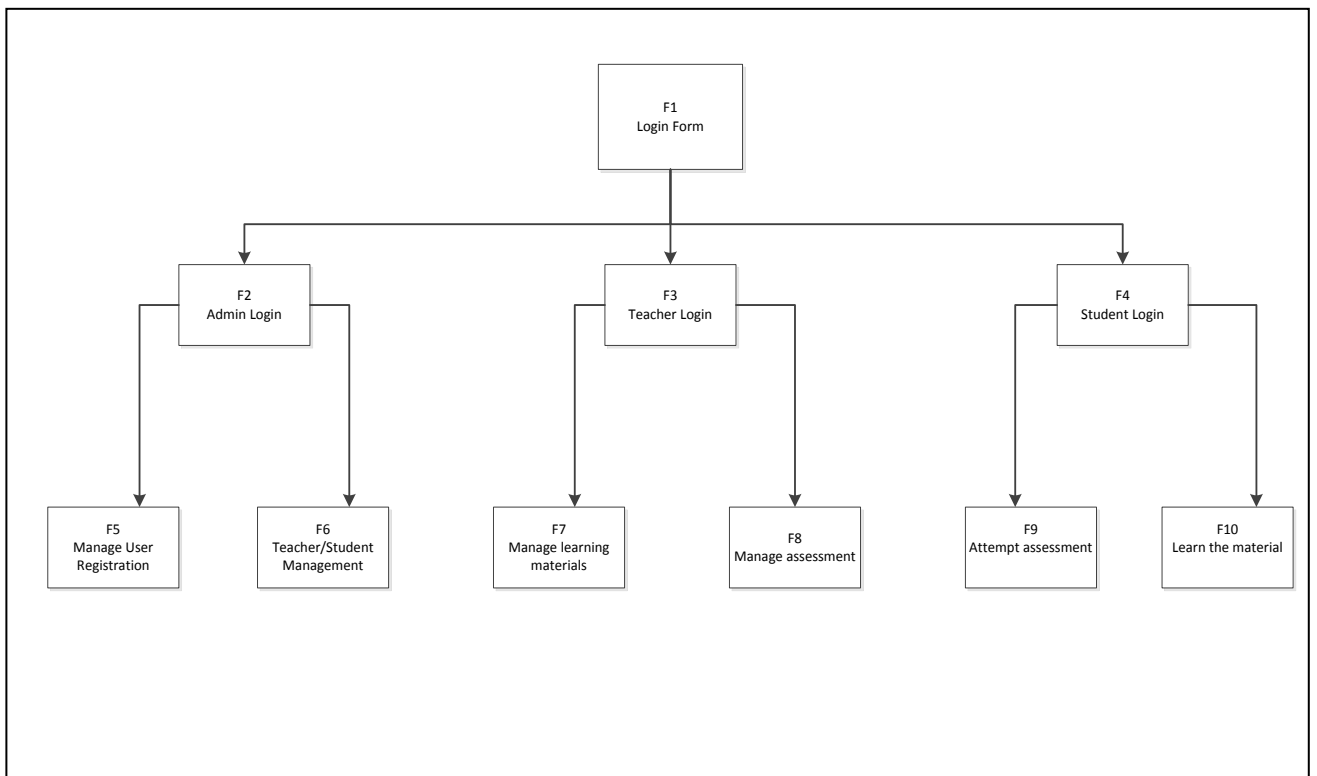


Figure 2-2-1: Flow Chart of Main Forms of OPTS

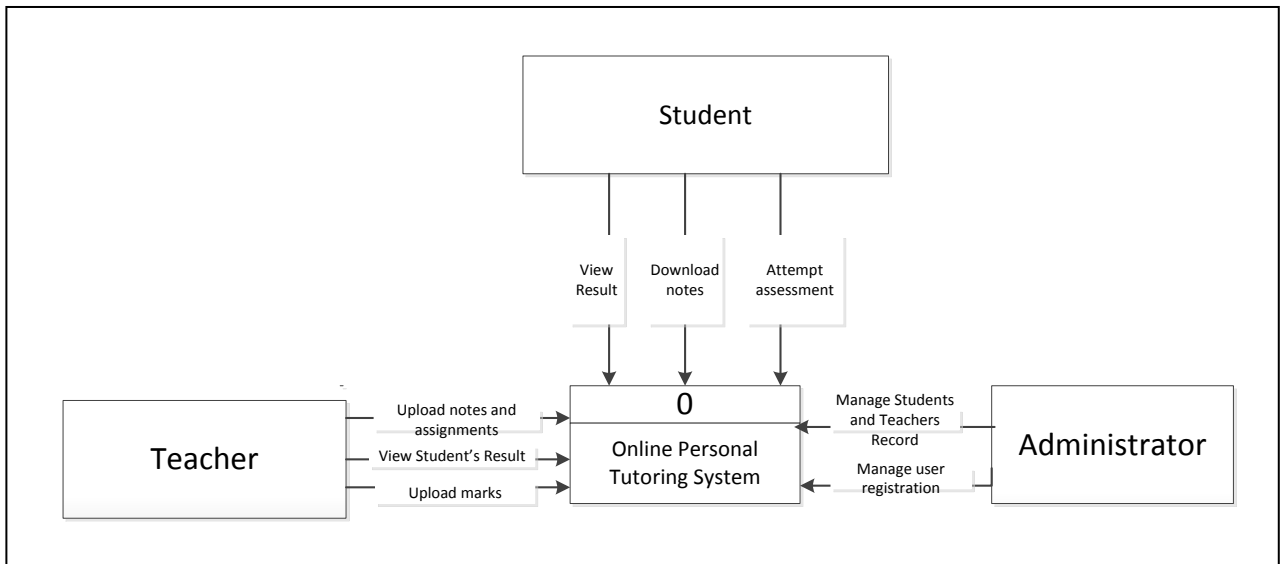


Figure 2-2-2: Context Diagram of the OPTS

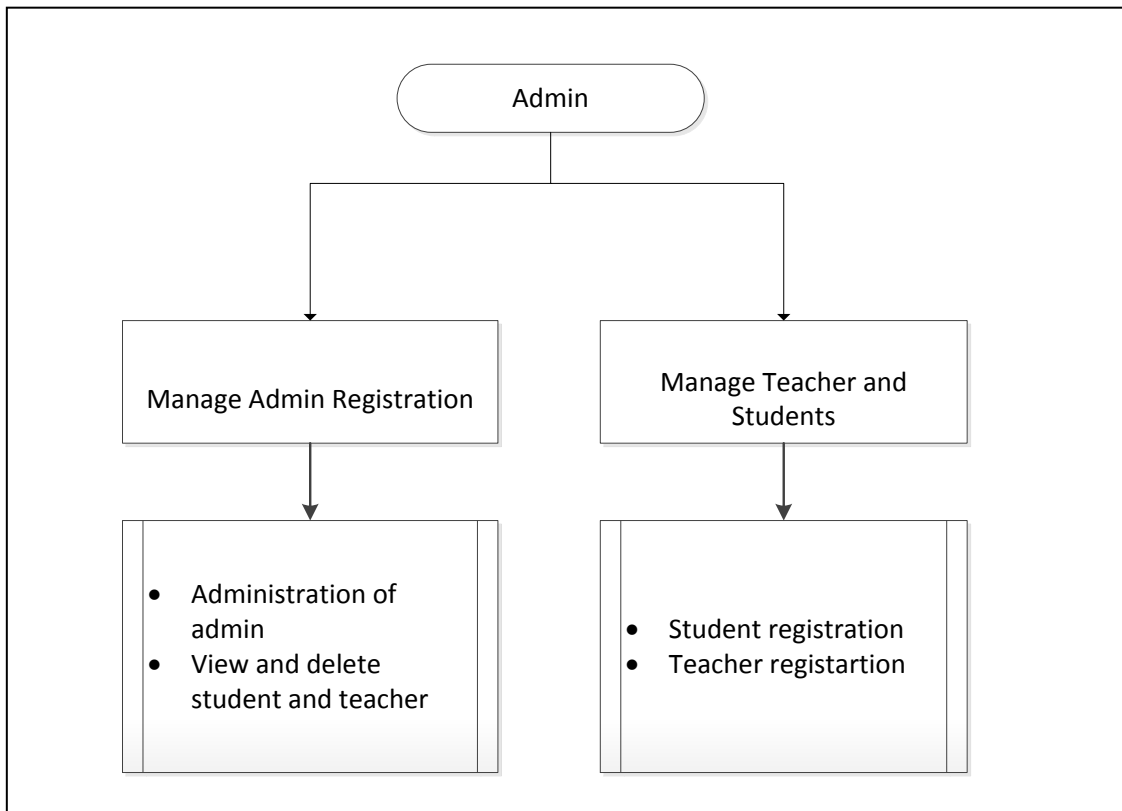


Figure 2-2-3: Flow Chart of Admin

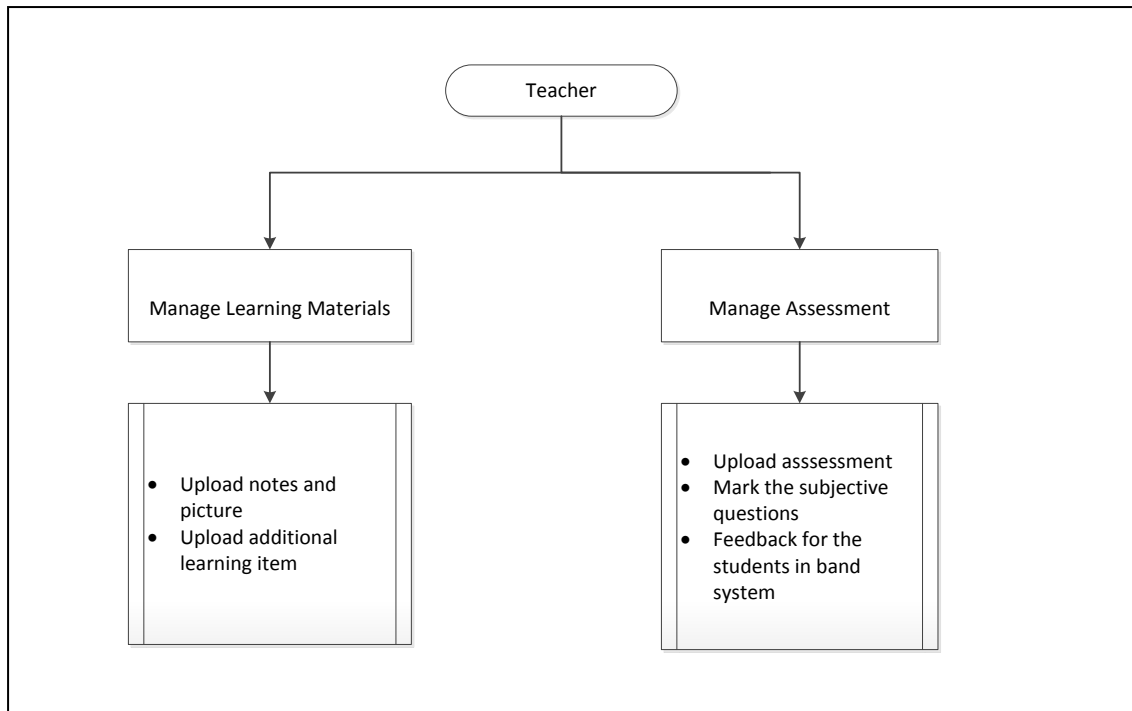


Figure 2-2-4: Flow Chart of Teacher

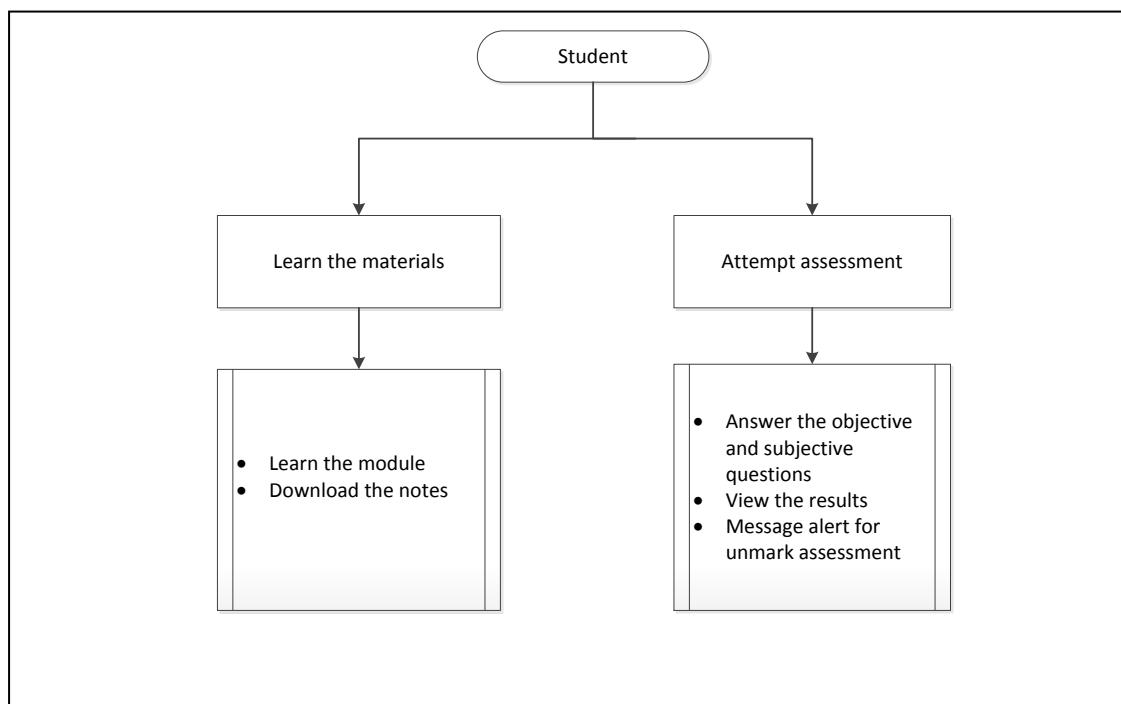


Figure 2-2-5: Flow Chart of Student