# DESIGN AND IMPLEMENTATION OF ONLINE ENTRANCE EXAMINATION

## (A CASE STUDY OF CARITAS UNIVERSITY ENUGU)

**BY**

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**REG NO: CST/2009/378**

**IN PARTIAL FULFILLMENT OF BACHELOR OF SCIENCE DEGREE IN COMPUTER SCIENCE/ INFORMATION TECHNOLOGY**

**FACULTY OF NATURAL SCIENCES EXAMINATON**

**CARITAS UNIVERSITY, AMORJI-NIKE ENUGU**

**JULY 2013.**

## CERTIFICATION

**This is to certify that this project DESIGN AND IMPLEMENTATION OF ONLINE ENTRANCE EXAMINATION (A CASE STUDY OF CARITAS UNIVERSITY, ENUGU) was carried out by;**

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**NAME OF STUDENT** **SIGNATURE**

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**DATE**

## APPROVAL PAGE

This is to certify that this research was carried out by Abi Thomas Augustine

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**Dr. BONIFACE EKECHUKWU**

**EXTERNAL EXAMINER** **DATE**

## DEDICATION

This work is dedicated to the Almighty God for giving me the knowledge, wisdom and understanding in the pursuit of my academic career.

I also extend this to my late father Chief A. E. Abi, mum, brother and sisters for all you love.

May God bless you all.

## ACKNOWLEDGEMENT

I want to use this medium to express my immeasurable and inestimable gratitude to my supervisor Mrs Chizoba Ezeme, my able Head of department Dr. Arinze Nwaeze, my Late Father, Chief Augustine Ekpo Abi for seeing me through up to this stage of my life; to my mother, Mrs. Juliana Abi for her unending love and support. To my sisters, Ene Abi, Lenwang Lenchang Abi, Nelly Abi, my late sister, Kokomma Abi, My dearest and only brother, Abi Augustine Abi, I say may God bless you all richly.

My gratitude extends to the following persons: Chief Patrick C. Okem and family, Very Spirited Reverend Father Francis Agantem Eworo, Mrs Philomena Adinye, Mr. Gabriel Omara-Achong, Mr. Thony Bankong, Mr. Chris Iklaki, Mr. Chris-Blaise Eweh, Dr. Otu-Ibor, Chief Peter Ojie, Chief Alex Egbona, Dr. Ikani wogar, Chief Igbe Aruku, Chief Dr. Oshega Abang, Barr. Venatius Ikem, Barr. Legor Idagbor, Barr. Patrick Egem Okem, Barr. Joe Abang, Miss Nsa Cobham, Sen. Prof. Ben Ayade, Prof. Larry Holmes Jr., Mrs. Martina Odom, Madam Saleya Kombo, Hon. Joe Eweh, Hon. Marshal Egere, Hon. Dean Otu, Chief Charlie Abuo, Mr. Robert Otu, Sen. Chris Ngige, Mrs. Oluremi Tinubu, Prof. Mrs. Ngozi Obasi, Dr. Julius Okputu, Hon. Ogana Lukpata, Mr. Ben Ojikpong, Mr. Etchue Agida, Prince Joe Aras Abue, Prince Michael Nku Abuo, Chief OkJazz Ewe, My darling

Governor, Sen. Liyel Imoke, His Deputy, Barr. Efiok Cobham, Hon Rita Ayim and many others who extended their kind hand of fellowship towards me. I couldn't have been more grateful. Remain richly blessed. God bless.

# ABSTRACT

Computers are known for their wide range of uses especially in scientific and mathematical fields. However little or no thought has been given to designing a complete and thorough intelligence entrance examination on a computer system in our immediate environment. This entrance examination system is designed to assist university administration examination in attaining a standardized sample, and as such the psychological implication of such a design is very important.

The design of the system is quite simple and easily understood. Its flexibility makes it amenable for future changes and amendment to either incorporate other aspects of intelligence or to be designed for any other school age or class.

The question of the online entrance examination system are programmed and visually displayed on the system's screen in an interactive form. The student answers the question on the computer system, immediately the question is marked and notified. The result of the examination is also displayed at the end of the examination which goes a long way to lessen the fears of students that they were marked down in the examination. Since the entrance examination is examined by the computer, time cost of manual examination is saved. Based on the virtues of internet amendment which have been made to the examination system concept by constructing a website with online entrance examination, online question setting and answer and online management by the administrator.

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# CHAPTER ONE

## 1.0 INTRODUCTION

An entrance examination is an examination that many educational institutions use to select students for admission. These exams may be administered at any level of education, from primary to higher education, although they are more common at higher levels. Online entrance examination systems are very convenient and fast. Online entrance examination system has three purposes.

1. To allow entrance examination takers at different places to take the examination at the same time through the online entrance examination website.
2. Through careful planning and proper coding, enable entrance examination, result checking and admission status on the websites.
3. To integrate database with the program allowing administrator easily addition of question and creation of entrance examination.

This document will propose all features and procedures to develop the system. This document specially containing details about objectives, scope limitation, process model, primary requirements, team development, possible project risks, project schedule, and finally monitoring and reporting mechanisms. Online entrance examination system is very useful for Educational Institute to prepare an exam, safe the time that will take to check the paper and prepare mark sheets. It will help the Institute to entrance examinationing of students and develop their skills. But the disadvantages for this system, it takes a lot of times when you prepare the exam at the first time for usage. And we are needs number of computers with the same number of students. The effective use of "Online entrance examination system", any Educational Institute or training centers can be use it to develop their strategy for putting the exams, and for getting better results in less time.

However the formulation of question for entrance examination is often treated with consciousness. With the developing of computer application technology, more and more computer application software is coming up. This application software's associated to every part of people's daily life, and so does the examinations. Just like other application system, examination systems develop very fast, from simple stand-alone system to C/S based system, and now some WEB based system. Although there are a lot of examination systems, but there also have blanks in some special fields. Examination Evaluation System integrated into the Multimedia Emulation Training System of certain type equipment is designed and will be introduced. This system can be used to help people familiar with the equipment usage quickly which can save money and time. Now the following will analysis and contrast the existing examination systems, and shoveling out the improvement of our examination system. Then we will introduce some characteristics of our system in chapter 3. And in chapter 4 we will introduce the key technology that applied in our system. At last we make a summary on our system and make a brief prospect on the future of the examination system.

## 1.1 BACKGROUND OF STUDY

Caritas University is a catholic private institution established by Very Rev. FATHER EMMANUEL EDEH. This institution was established in the year 2005 and located in Amorji-Nike Enugu state.

Caritas University have two venue for their examinations, Charity Square and Auditorium. Auditorium is under roof amendment. Caritas University with over four thousand students has four faculties presently and they include natural

science, engineering, environmental and social science. Caritas University uses the manual method of paper and pen for entrance examinations.

Automation of the entrance exams involves the experts reasoning process to solve the problems involve in the manual entrance exams by using certain program validation in the program properties to check for some criteria. Automation of entrance examination involves a set of program that manipulate encoded knowledge to solve problems in a specialized domain that normally requires human expert.[1] Edward A. Feigenbaum was one of the people in software based pc consultancy's research who decided in the mid 1960's the reason why pc consultancy should be produced, the reason was that he thought on how important it is to know how much a computer program can know and the best way to find out would be to try constructing an artificial expert.

In the process of looking for an appropriate field of expertise Feigenbaum encountered Joshua Lederberg, the noble laureate biochemist, who suggested that software for entrance examination in various fields is to be produced together they began work on DENDRAL, the first software Based Examination system in 1965 at Stamford university.

‘’when you think you have you have created a program structure capable of manipulating expert knowledge, you have to get some knowledge into the system”. {2} {Joshua Lederberg}

The characteristics of this expert system include the ability to encode knowledge in a program. It also has the capability to draw it`s reasoning from meta-knowledge (inference) which is very important feature of expert system. It has a high performance of helping to solve problem of marking answers without favoritism.

## 1.2 CARITAS UNIVERSITY IS MADE UP OF FOUR (4) FACULTIES NAMELY:

**Engineering** with the following department: Computer, Mechanical, Chemical and Electronics Engineering.

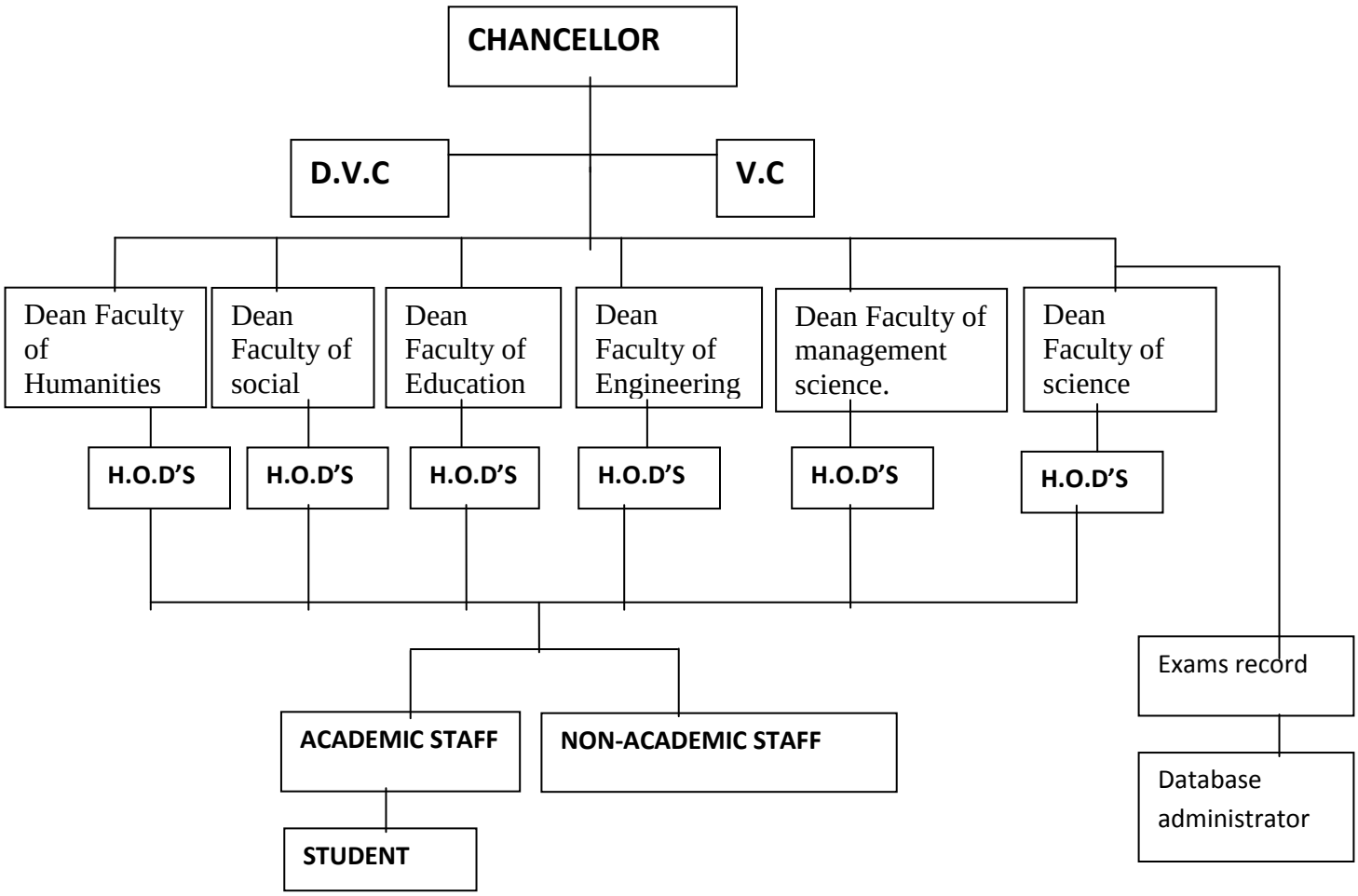
**Environmental** with the following departments: Architecture, urban& regional planning and estate management.

**Management and social science** with the following department accountancy, economics, business administration, public administration, political science, industrial relation and personal management mass communication marketing banking and finance.

**Natural Science** with the following department biochemistry computer science &information industrial chemistry mathematics & statistics and microbiology &biotechnology.

In universities like caritas they have not been able to implement an online entrance examination system which can allow student login and write their exams from any location around the globe once they have purchase their entrance examination card., though they have been several anticipated work but no reliable software to back it up .i have analyzed the situation and discover that though much effort is required to develop and maintain this online entrance examination system. I hope all necessary tools within my reach would be reliable enough to make this software development.

## ORGANIZATIONAL STRUCTURE




## 1.3 OBJECTIVE OF THE STUDY

- Corporate between the data stored in the server of the Institution and our on line entrance examination system. To deal with On-line System in an easy way and an efficient mannered. (Connection process)
- Create strong and secrete data base that allow for any connection in a secret way, to prevent any outside or inside attacks or question leakage.

- Specify a privilege to administrators to be able to change their question at will before the online entrance examination.
- Prevention of exam malpractices by applying strict timing possibility for each question and marking of questions immediately, The student fear of been marked down is eradicated and sorting practice is reduced.

## 1.4 JUSTIFICATION FOR THE SYSTEM

Due to the inconsistency which have persisted in entrance examination system through the university administration system and neighboring institutions

The justification for this work is as follows:

- To do away with manual method of paper and pen for entrance examination which have posed serious threat to the standard of student ability during exams.
- The manual method could not handle the problem of sorting,and exam malpractice during exams as result an efficient method has to be put in place to eradicate the possibility of occurrence. An “on-line entrance examination system”.
- To reduce the fears of student thinking they where mark down during the entrance exams.
- To save cost of constant purchase of answer booklets and also save time and human labor of strolling round the exams to checking for student irregular act in the exam hall, malpractices etc.
- Entrance examination student can easily write their exam anywhere around the globe once they purchase the school scratch card for the entrance examination.

## 1.5 STATEMENT OF PROBLEM

Design and implementation of an online entrance examination system. This system allows candidates to register and take an examination in the system. The teachers of this system are allowed to login for contributing questions and viewing profile of candidates. Administrators will be able to access the system to sign up to a new entrance examination, manage questions, accounts and view profile of the candidates.

I will borrow a host for implementation our system. Our group will keep the existing entrance examination catalog database by using Microsoft access to access database.

At the first entrance examination, guest must register an account to become a candidate by fill all required information such as name, birthday…. Once the registration process is completed for a guest, the registration system sends information to the billing system so the guest can be logged in the system.

After that, the system will allow candidate to login and select a department for examining.

Every time, the candidates will be able to view their profile.

The teacher must be able to access the online system to contribute questions. They also can view the profile of candidates.

The administrator manages operation of the system such as managing accounts and questions, viewing profile of candidates.

## FEATURES

- Type of Questions-multiple choice, true/false, fill in the blanks and essay.

- Exams can be timed or untimed set the date and time when the specific entrance examination has to be available. Can include pictures, graphics and flash (.swf) files in the questions of the online examinations.
- The Student and Faculty details are stored in the database.
- The Online entrance examination system has a password based authentication system for students as well as System Administrator.
- Trends Graphs Included for analysis-system is capable of generating statistical data for examiner.

## 1.6 SCOPE OF THE STUDY

This Supplementary Specification applies to the Online entrance Examination, which will be developed by me under close supervision of Mrs. Chizoba Emeze using all the necessary material within my reach to ensure a successful project result.

This specification defines the non-functional requirements of the system; such as reliability, usability, performance, and supportability, as well as functional requirements that are common across a number of use cases. (The functional requirements are defined in the Use Case Specifications.)

**Functionality:**

Multiple users must be able to perform their work concurrently. If student is running out of time, it should be notified.

**Security:**

Protect student from cheating.

## 1.7 SIGNIFICANCE OF STUDY

In the modern world with all the complexities involve in managing a university management requires well structured and scientifically derivable information as a basis for online entrance examination for student.

The survival and continuous growth relies on the management of the automated system. In some places like Europe they make use of the online for entrance examination for student this method has proven to be very efficient and met so many standardization eliminating the manual method of pen and paper.

The study will contribute positively to show student their answer and admission status after the exams if they have met the necessary school perquisite.

In this era of dwindling resources the management of public and private institution, will need an effective system (online entrance examination system).with online entrance examination system human labor is saved, time and cost is maximized effectively.

## Glossary

### Introduction

This document is used to define terminology specific to the problem domain, explaining terms, which may be unfamiliar to the reader of the use-case descriptions or other project documents. Often, this document can be used as an informal data dictionary, capturing data definitions so that use-case descriptions and other project documents can focus on what the system must do with the information.

**Definitions**

The glossary contains the working definitions for the key concepts in the Online Examination System.

**Exam**

A entrance examination offered the system, have some question and multiple choices answer.

**Teacher**

A person contributes questions and views profile of candidates.

**Candidate**

A person has an account on the online entrance examination.

**Administrator**

A person manages the operation of the system.

**Guest**

A person registers an account in the online entrance examination.

**Profile**

All the information of candidate such name, birthday, grades of all examined entrance examinations.

**Question**

A problem has 4 choices and only correct answer.

# CHAPTER TWO

## 2.0 LITERATURE REVIEW

Several researches have been directed towards the development of a fast an efficient way of writing exams without laxity. Some of the research carried out and the views of several writers concerning the development of an online entrance examination or other related software technology are as follows

Online instruction seems to be the ideal answer for busy individuals with a job who need more education in order to advance or just keep pace professionally (Holt, 1999; Macht, 1998) this is simply referring to a way of keeping learning to far individuals who which to study close . A report by a faculty group at the University of Illinois, however, has found many on campus students take many if not all of their classes online (Regalbuto, 1999).a basic concept of online entrance is facilitated around the online learning which also a very important factor.

As distance and Web-based learning becomes more popular and more accessible, high school, college and graduate courses are being offered via the Web as part of complete diploma and degree programs by more and more institutions.As a result student who which to gain entrance to higher institution can also write their entrance exams online. Vetter, (1997) used an InfoSeek search with the term "online courses," it returned 3.5 million hits. Corporations have found online learning to be a more economical alternative than the typical corporate training session (Himmelberg, 1998). However, little research has 130 been done to understand some of the ramifications of this fast growing phenomena (Grossman, 1999).Different professors' classes could have different class population characteristics, and could give those professors different impressions and opinions of issues confronting online instruction. In the future, as online education becomes

more pervasive, the characteristics of the online student could change, and so too, the problems of online education. Student Evaluation Practices Student evaluation strategies used by instructors not only serve to motivate, but to help students select strategies to organize their learning (Davis, 1999; Wakeford, 1999). Decisions by instructors of which evaluation methods to use, serve as a hidden code to students directing them to the skills and behaviors that are important for them to succeed (Crooks, 1988; Science Education, 1997). Many students tend to invest their Time as economically as possible, by studying only those aspects of a course that they expect will affect their grade (Science Education, 1997). "The learning strategies students adopt are powerful predictors of educational outcomes, so that expertise in the selection and application of learning strategies is an important educational outcome" (Crooks, 1988, p 441) These evaluation cues are sometimes not obvious to the instructor (Tang, 1998).Crooks (1988) cited a study of the curriculum at the Massachusetts Institute of Technology by Snyder in 1971. Here the formal curriculum described an approach 131characterized by problem solving, and creativity, however, the evaluation procedures, which he called the "hidden curriculum", were oriented towards surface learning. Fuhrman (1983) listed the importance of various data sources in assigning grades. This was gathered from a study of 700 faculty members at a major state university. Table 1 Importance of various data sources in assigning grades Source: (Fuhrman & Grasha, 1983, p 168) two studies explore how assessment is accomplished in a distance learning environment. One study by the National Center for Education Statistics (Lewis et al., 1997) found that 98% of all institutions use entrance examinationing for their credit-bearing distance learning classes. One third of the classes used proctored group exams at remote sites, while another third gave proctored exams on campus. About 15% of the instructors sent The students their exams by mail or fax (so the

students could take the entrance examination independently). About 8% take interactive entrance examinations at remote sites using  A second study by Dirks (1998), where 20% of the distance classes were Delivered by the Internet, found that the larger the class size, the more likely that exams would be used to determine more than half the grade.Many evaluation situations are focused towards a specific type of learning outcome by the nature of their logistics.

1997).Many of these entrance examinations contains objective items, which are difficult to design, as a tool to assess higher order thinking skills (Travis, 1996). Garfield (1994) notes that entrance examination items usually evaluate skills in isolation and very rarely integrate them in a real world context (Garfield, 1994).

The Western Governors University and The University of Phoenix Online use a series of comprehensive examinations to know what classes their students are required to take. Students pass classes by passing only the exams, in some cases. Some of these exams include essay or multiple-choice items, while others are projects. These high-stakes, standardized entrance examinations are usually administered in proctored, online environments (Carnevale, 2001).The College Independent Study program, a distance education program at the University of Nebraska-Lincoln, utilizes proctored, individual exams for all its classes (Swoboda, 2000).Various item types have their own advantages and disadvantages. True-False questions are easy to construct and grade. However, guessing would be 50% correct, and it would be difficult to entrance examination gray areas (Davis, 1999; Science Education, 1997).Good matching problems should have different numbers of items in both columns and there is the possibility of having more than one correct answer. These

Items assess associational knowledge by entrance examination recognition rather than recall (Davis, 1999; Science Education, 1997).

Multiple-choice questions are probably the most commonly utilized objective entrance examination item. Though the distracters are difficult to write, the items are easy to grade. These items can be constructed to measure simple recall and complex critical thinking skills. However, multiple-choice questions, which effectively entrance examination higher order thinking skills,Are very difficult to write. These questions can be answered quickly, so instructors can evaluate many different objectives in a single session (Boulton-Lewis, 1998; Davis,1999; Gay, 1980; Science Education, 1997; Wakeford, 1999).While short-answer questions are easy to write, they take more time to score.They eliminate guessing, and stress recall of information rather than recognition. Critics feel that this type of question can place too much emphasis on rote learning. However,they can give limited insight into how students can express their thoughts (Davis, 1999; Gay, 1980; Science Education, 1997; Wakeford, 1999).cheating, rather than having the person state that they themselves participate in those activities (Cizek, 1999).Two studies have used course outcome and exam grades in order to show the

Existence of cheating in specific instances. Ridley and Husband (1998) used a comparison of the grades 100 students received from Web-based class work and those received in traditional on campus classes to show that a significant difference did not exist in the rigor or integrity of the Web-based courses.Gigliotti, Smerglia, Falk and Neiswander (1994), conducted a study to compare computer based entrance examinationing to in-class entrance examinationing. Among other things, the computer-entrance examinationing group scored significantly lower grades than their in-class counterparts. The grades of

The computer-based examination group were normally distributed, while the grades from the in-class examination group were skewed upwards. Giglotti et al (1994) attributed this difference to the group that used computer entrance

examinationing having less opportunity to ask for clarification during the entrance examination. Sloss (1995), attributed this difference to cheating. He noted that, with the computer randomly generating questions, copying would be impossible and meaningless. The skewed results, he suggested, were the results of the poorer students cheating more than the better students. Gigliotti, Smerglia and Falk (1995) subsequently agreed with Sloss's comments. Identification checks were done in the computer lab, while none were done for the in class-entrance examinationing group (even though one lecture class had 260 class members).Characteristics of Academically Dishonest Students Gender. Most of the studies revealed that males cheat than females (Aiken, 1991; Allen et al., 1998; McCabe & Trevino, 1997; New stead et al., 1996). The McCabe and Bowers (1994) study indicated that women were catching up. McCabe and Trevino (1996) felt that this could be because women were entering traditionally male careers. Kerkvliet (1994) found that the opposite was true, and concluded that women were more likely to cheat than men.

Maturity. Many studies concluded that there is more cheating in high school

Than in college (Davis, Grover, Becker, & McGregor, 1992; Sierles, Kushner, & Krause, 1988). The frequency of cheating then decreases again from college to graduate school. Many reports have noted the relation of maturity with increased honesty (Allen et al., 1998; Haines et al., 1986; McCabe & Trevino, 1997; Newstead et al., 1996).Others found that other components of maturity besides age, such as marital status and financial independence from their parents, are related to greater academic integrity (Aiken, 1991; Diekhoff et al., 1996; Genereux & McLeod, 1995). Academic Achievement. McCabe and Trevino(1997) had found that students with a lower GPA cheat more than students with a higher GPA. With an experimental study (not by self-reports) Nowell and Laufer (1997), found that

the student's grade in a particular class was negatively correlated with their likelihood of cheating. Houston and Ziff (1976) found that students may be more likely to cheat after a success, and suggest that a failure after a success would be unbearable, while failure after a first failure is understandable.Peer approval or disapproval of cheating. Bowers (1964) studies have shown that peer approval or disapproval is likely to determine one's cheating behavior in college. The McCabe and Trevino study (1997) revealed this factor was the most influential in determining if a student would cheat; it accounted for 27% of the variance.Situational Aspects of Why Students Cheat Some reports conclude that demographic studies have not yielded a convincing and consistent picture of who cheats. There are consistent situational or environmental characteristics of situations where students cheat (Leming, 1979; Maramark & Maline, 1993).

Most cheaters recognize that cheating is wrong, but believe that they are in special circumstances that make it right for them to cheat (Sykes & Matza, 1957).Students reduce the amount of guilt felt by rationalizing dishonest actions, actions normally considered wrong. Haines et al (1986), found cheaters usually justify dishonesty by citing the difficulty of the work, amount of work, and lack of time.McCabe and Trevino (1999) reported that one of the largest response categories to their open-ended survey included various justifications for cheating. Diekhoff et al. (1996) report that there was an increase in the rationalizing attitudes of students toward cheating from 1984 to 1994. They found these rationalizations were more common among students who were younger, less committed to academic values, and under more pressure to succeed. "When they cannot justify cheating, they cheat anyway because dishonesty does not have to be justified if it is the norm"(Diekhoff et al., 1996, p. 500).Haines et al. (1986) showed that such rationalization is a "common denominator for cheaters" (Haines et al., 1986, p. 350).Some students cheat out of

ignorance and a misunderstanding of what constitutes dishonesty. This is especially true of plagiarism and collaboration(Maramark & Maline, 1993). Uhlig and Howes (1967) note, "students are sincerely puzzled by the appropriateness of certain kinds of activities loosely defined as cheating"

(Uhlig & Howes, 1967, p. 412). They state that we cannot control this problem unless students understand what is considered cheating and not cheating. McCabe and Trevino (1999) pointed out there are gray areas where students feel justified to cheat, and other times when they sincerely did not think they were cheating.Methods of Reducing Examination Cheating in the Traditional Classroom

Communicating integrity expectations. Four-year institutions usually have single-purpose brochures for informing students, faculty, and staff about academic integrity. Orientation is the most likely source of information for students. For faculty, the Faculty Handbook is the most common source of information about academic integrity for faculty. It concerned Aaron (1992) that the vast majority of faculty do not discuss academic integrity with their students. Kibler (1994) found that only half the schools communicated regularly to students and faculty about academic integrity.Roth and McCabe (1995) found that communication is necessary to stop mistrust between faculty members and students concerning academic integrity. Faculty need to understand that the lack of action in this regard has the effect of reinforcing the dishonest behavior of students. To prevent misunderstanding, a list of responsibilities toward academic integrity should be developed (Nuss, 1984).

Although stern warnings are more effective than moral appeals, this was not a complete solution. Some students continued to cheat in spite of the warnings (Tittle &Rowe, 1974).Houser's (1982) work with 6th graders has shown that, even with this group, coercive statements by the entrance examination giver were associated

with the least amount of cheating as compared to reward, referent, and legitimate informational and control statements.

Houston (1983a) found a sanction threat would inhibit cheating if it was a severe threat, and if the subject had done well on a previous entrance examination.

Honor codes. An honor code is a college community's way of identifying itself with academic integrity. Institutions with honor codes have four characteristics.Students must sign a pledge of academic integrity. Students and faculty members are obligated to report violations. Students are unproctored during exams. Lastly, student-

Controlled courts or councils handle violations (Pavela & McCabe, 1993).Honor codes on a campus provoke discussion of the importance of integrity and honesty to the campus and academic communities (Pavela & McCabe, 1993). Students in successful honor code institutions have good understandings of the rules regarding academic dishonesty than do others because the issue is explained and discussed (McCabe & Trevino, 1999).Maramark and Maline (1993) state that honor codes seem to work well at military schools and small schools because of a shared allegiance to the school and values. It is more difficult to say how useful honor codes are at larger, more diverse schools.

There are critics of the honor code system. McCabe and Trevino (1999), in their open-ended inquiry, found 6.8% of their surveyed honor code students said the honor code was ineffective. They said that cheating continues on campus in spite of the honor code. Some said that they were hazy on how the honor code worked. Honor code systems can be used against certain student groups. After complaints a student vote failed to remove the 152-year-old honor code system at the

University of Virginia. Critics contend that the system is unfair to black students because a disproportionate number of black students, many of them athletes, were accused each year (Hall & Leeds, 1994).

Sierles, Kushner and Krause (1988) did not find that the newly instituted honor System at a Midwest medical school led to a decrease in cheating. It was not more effective than faculty monitoring, proctoring, and sanctions.

Vigilance and enforcement. Alschuler and Bliming(1995) said that all the reasons for cheating fall into two categories "Norms that sanction cheating and benefits that outweigh the costs" (Alschuler & Blimling, 1995, p.123). It is important that students think all cases of cheating can and will be detected. The threat of sanctions eventually becomes an empty threat when students discover that it is impossible to detect all cases of cheating. There are methods to compromise the most secure systems (Houston, 1983b). This is confirmed by many studies.

Some students cheat only because the opportunity presents itself. Leming (1980) found that students cheated more under low risk conditions than high-risk conditions.

Nonis and Swift (1998) has shown that descriptor and attitudinal variables have more of an impact on cheating frequency when deterrents are high compared to when deterrents are low. Also, the most often used cheating techniques are the ones which are not planned.High levels of cheating could be deterred by simple techniques such as more vigilance and separating students. Uhlig and Howes (1967) support this finding, and note that college students will cheat if the climate is advantageous. Moffatt (1990) found the major reason for not cheating was the fear of being caught. Love and Simmons (1998) found that both the fear of being caught and the embarrassment that would follow deter students from cheating.

Several studies have shown that there will be a reduction in cheating when penalties are expected and enforced (McCabe & Trevino, 1993; Michaels & Miethe, 1989; Mixon, 1996). McCabe and Trevino (1997) found that students believed that severe or unrealistic the penalties would not be imposed; unrealistic penalties became positively associated with cheating (McCabe & Trevino, 1997).Deterrents do not have the same effect on all students. In-class deterrents haveless of an impact on males with low GPAs. Older females with higher GPAs are more likely influenced by in-class deterrents (Nonis & Swift, 1998).

"Attention to classroom entrance examinationing is an important consideration in attempting to

Control classroom cheating" (Leming, 1990, p. 85). This is because sanctions, threats, and high risks of detection substantially reduce cheating.Genereux and McLeod (1995) found that low instructor vigilance results in more cheating. On the other hand, high instructor vigilance and using relevant course material in composing the entrance examinations decreased cheating. Bowers (1964) feels the next best system to the honor code was where the faculty took control of proctoring.Nuss (1984) found that 23% of the faculty and 21% of students believe that cheating occurred because "no one ever gets punished for it" (Nuss, 1984, p. 142).There is a self-reported cheating rate of 45% occasional cheaters and 33% students who cheat often on the Rutgers campus of 33,500 students. In 1990, only 80 cases of cheating were reported (Fishbein, 1994). In a survey by McCabe and Trevino (1995) a student noted "it does not pay to be honest in school because, with certain forms of cheating, the chances of getting caught are slim to none" (McCabe & Trevino, 1995, p.7).Take home entrance examinations. Marsh (1988) found experimentally that there was more cheating by students who took a take home exam than by students who took an in-class exam. However, Weber and

McBee (1983) found that there was little difference in the level of cheating between take home, open book, and in class exams. They concluded“finding an answer in a book is probably a more reliable and efficient procedure than having to find the brighentrance examination student in class” (Weber & McBee, 1983, p. 6).Faculty support of academic integrity. McCabe (1993) studied the reactions of faculty members to cheating as reported by their students. Faculty at honor code institutions were reluctant to enforce academic integrity rules, but did so twice as often as did the faculty at non-code schools. Forty percent of the 200 professors surveyed had never turned in a student for cheating, 54% seldom turned in a student for cheating, and only 6% chose often. McCabe and Trevino (1995) found that many professors do not wish to be involved with the reporting of cheating violations. Only 50% said that they 151 would use their school’s reporting procedures. Some said that they would not report it unless there was unequivocal proof. Others would not report students even if there were such proof. Faculty said that students are very much aware of which professors will turn them in, and which ones consider it too much red tape. Application to Online Entrance examinationing

When students thought the class workload was impossible to complete in traditional classes, they would cheat in order to insure their survival (Aiken, 1991; Ashworth & Bannister, 1997; Butterfield, 1991; Clayton, 1999; Fishbein, 1993;Fishbein, 1994; Genereux & McLeod, 1995; Nonis & Swift, 1998; Sierles et al., 1988; Steininger, Johnson, & Kirts, 1964). The amount of work necessary to complete an online course is cited as a reason for large number of students to drop these classes (Phipps et al., 1999; Regalbuto, 1999; Vachris, 1999). Ridley and Sammour (1996)report a drop out rate of 25-30% of the students in the online classes they investigated.Vachris (1999) notes that, in an unpublished research paper by Puckette, Barnhart and Martinez (1995), students tend to drop out

because of the large workload rather than because of difficulties with the technology. The same stress which could cause students to drop a class, may make others cheat in order to pass (Gray, 1998). Dirks (1998) found that online instructors were frustrated because cheating was so difficult to prove; yet the "burden of proof" was strictly their responsibility. He also found that only 15% of the distance learning syllabi included academic dishonesty policies.152 Three studies have been made to gauge academic integrity during online instructional situations. Engineering students at Coventry University took online entrance examinations with a traditional lecture class. The entrance examination scores of the supervised groups, both traditional

paper and pencil and online, were slightly, but not significantly lower than the unsupervised online entrance examination takers. The supervised students felt that there needed to be "safeguards against collusion" by unsupervised entrance examination takers (Lloyd & Martin, 1996).A study by Ridley and Husband (1998) compared the grades of students who had taken both online and traditional on-campus classes in order to determine if there was more cheating during the online classes. The students "offline" course grades were higher than online course grades. The authors of this study concluded that there was no evidence of academic cheating based on grade data.A year later, (Snell & Mekies, 1999) a rebuttal to this study suggested that there may be different explanations for the grade difference. It was suggested that students may sign up for online classes for the wrong reasons. Some students may feel that the classes will be easier because they did not have to attend classes. When the students don't keep up with the work, they begin to fall behind. Some students may sign up for the classes thinking that, because of the computer's anonymity and privacy, they would be able to cheat. When students find there are safeguards, they either drop the class (if possible) or fail the class.

Methods of Reducing Online Examination Cheating As noted earlier, methods for controlling academic dishonesty fall into two distinct categories: honor codes, and deterrents. Honor codes and communications about 153 academic integrity are the solutions of choice for a stable group or community whose members know one another well, such as a high school, small college campus, or place of employment. These methods are not a workable solution for entrance examinationing someone whom you have never met and may never meet again. A second group of strategies are utilized to deter dishonesty. The strategies for reducing online examination cheating come from a combination of expecting integrity while utilizing deterrents to encourage honesty. Communicating integrity expectations. Many students are not certain of what constitutes cheating. Students need to be told explicitly what constitutes dishonest behavior if it is to be deterred (Cizek, 1999; McCabe & Trevino, 1993). Carlson (1999) notes that this is important in online entrance examinationing. He suggests that integrity policy should be noted and posted on the syllabus. Proctored entrance examinations. Administrators of the Dallas Community College system have found that different courses can be categorized as high or low risk courses for cheating. Lowest risk classes for dishonest conduct are those which prepare students to take state boards or certification exams. Students know that they will be entrance examinationed on this material in the future under very secure conditions. There is also a reduced risk of cheating when the class is a prerequisite for another required class. For distance classes not in these categories, administrators encourage the use of proctored entrance examinationing centers (Tulloch & Thompson, 1999).

In surveying the literature on implementing online instruction, not one of the reports recommended unsupervised online entrance examinationing. Many distance learning divisions, including those at Tallahassee Community College and

Northern Virginia Community 154 College, require students to take at least one proctored exam during the term (Hayes, 1997; Northern Virginia Community College, 1998; Serwatka, 1999).Proctored exams are strongly recommended by Gray (1998). She also recommends that photos be collected from students as they register so that the proctor can verify their identity.Using projects and other papers. Many of the instructors of these courses must administer entrance examinations with no security except the students' word. Many professors, therefore, rely on papers and projects that require creative thought (Dirks, 1998; Kearsley, Lynch,& Wizer, 1995; Zhang, 1998). Students can purchase a paper to fit their needs on the Web, so the assigned topics must be well designed (Kleiner & Lord,1999).Honor code. In a traditional campus community, cheating is kept somewhat in check by the campus culture where there is a strong commitment to the educational process, and a code of ethics that opposes cheating (Davis et al., 1992; Roth & McCabe, 1995). McCabe and Trevino (1999) suggest that this sense of community membership would be difficult to develop in a larger school where there are many commuter and part-time students.

A committee on "Academic Integrity at a Distance" at Florida State University recommended that an existing campus honor code should be applied to distance learning students with only minor revisions. Examples of infractions should include personal misrepresentation and online plagiarism (Hayes, 1999). No systematic studies were found that addressed the difficulties of establishing an honor code for distance or online learning students. Entrance examinationing Practices. In the article, "Maintaining Academic Integrity in Web-155 Based Instruction," Gray (1998) offers suggestions to instructors of Web-based classes. She suggests that, when using online entrance examinationing, the instructor post the entrance examination to a URL. The address is E-mailed to students at a

predetermined time along with a deadline for completion. She also suggests integrating quizzes in exercises and readings to make it difficult to get a person unfamiliar with the course specifics to help without demanding a great deal of their time. Biometrics. As people have begun to utilize the computer for more daily activities, access is now dependent on a password, which many times is lost or stolen. Biometrics is one of the more recent security methods, which are being employed by business, industries, and the military to replace the password. Biometric techniques include the measuring of physical attributes or personal traits in order to automatically compare a person's unique characteristics to data on file. Some of these unique characteristics include fingerprints, voice patterns, faces, hands, irises, retinas,handwriting method, or typing method.The Dallas County Community College district began considering various biometric options for online entrance examinationing in 1999 (Tulloch & Thompson, 1999). Brooks (1997) proposed using face recognition as an automatic verification method during entrance examinationing. ETS is installing digital cameras, so that student photographs become part of the entrance examination record. ETS also successfully field-entrance examinationed iris scans in six centers (Thomas, 2001). Two different entrance examinationing situations can benefit from biometric identification. Biometric systems could be used to authenticate a student's identity when entering or leaving a large group lecture hall, or a supervised computerized entrance examinationing facility. Also, biometrics could be used as part of a security system to supervise students while they 156 are being entrance examinationed online. Each of the biometric options has specific capabilities that make each of them better for some situations than for others. Online entrance examinationing is the most complicated of all the entrance examinationing situations. The objective is to replace proctoring during a entrance examination

with an automated system. Biometric systems to protect access to the Internet and to World Wide Web services have been developed these systems are based upon fingerprints (Jain & Hong, 1996), hand geometry (Jain, Prabhakar, & Ross, 1998), and voice (Boves & Koolwaaij, 1998). They afford Protection only for the initial log-on transaction. This level of security is needed tonprotect access to specific files, and for Internet commerce.

There are concerns, which make the entrance examinationing applications different from other biometric security applications. The users of most login applications benefit from protection by a security system, and choose not to defeat it. In most cases the people trying to defeat these systems are non-users. With entrance examinationing, however, it may be to the user's advantage to defeat the system. One of the first problems concerns enrollment. No matter how securely the system is designed, if the correct person is not enrolled, the use of biometrics does not help (Ashbourn, 1999; Boves & Koolwaaij, 1998; Schneier, 1999). Enrollment should occur before the student has even begun the class. Every effort should be made that the

Enrollment process is well supervised and verified. The ideal system needs to be capable of providing continuing, transparent, positive identification of the person sitting at the computer keyboard. Ideally the entrance examination would not begin until the student is identified positively. Then, while each question is being answered, the system would provide continuing periodic positive identification of 157 the student. The student should be able to leave in-between questions. Only a camera-based system can provide this type of information. While being entrance examinationed, a user would have to look at the monitor often. A small video camera, mounted on top of the monitor, could capture the student's image at certain time intervals without interrupting their work (Richards, 1997). Since

nearly all video camera installations include a microphone with a soundboard, layering face recognition with speaker verification could provide more accuracy in the future without adding to the student's hardware expenditure. As cited earlier in this study, accuracy is also improved in biometric recognition by using multiple image captures for comparison. In an online entrance examinationing situation, many images would be captured at random times. Some of these images may not be useable for face recognition because the student has slumped in his chair or is looking at the keyboard. Recognition of the majority of the others would be used as a declaration of recognition of the entrance examinationer. The ultimate entrance examinationing system must have safeguards to prevent others from helping during the entrance examination. An unscrupulously motivated student could think of many simple ways of circumventing an online entrance examinationing system. This could occur by simply having a knowledgeable person taking the entrance examination while the camera is turned towards the supposed entrance examination taker. More sophisticated students may utilize double monitors or utilize keyboards as a prop. One solution is for random images to be taken and sent without being processed, so that the instructor can notice and have a record of any improprieties.

## 2.1 COMPUTER VERSUS PAPER

The critical question on the survey form asked if respondents felt on balance, it is better to have a formal entrance examination conducted using computers or using more traditional handwriting on paper. Opinion was divided with 46% favouring each alternative and 7% selecting both options (230 valid responses). This compares with 94.5% preference for computer-based entrance examinationing

found in a case which included online feedback (Jonsson,Loghmani & Nadjm-Tehrani 2002).

However, opinions were significantly different between the groups of students $F(2, 227) = 3.484$, $p= 0.032$. Whereas 56% of Group A preferred exams on computers, only 35% of Group B preferred this medium. The team considered the greater reported incidence of technical problems in Group B could be Responsible for this difference, but this was not confirmed by a one way ANOVA Showing little difference in preferred medium with $F(2,222) = 2.667$, $p=0.073$

| | GROUP A | GROUP B | GROUP C |
|---|---|---|---|
| N | 138 | 130 | 2 |
| Respondent | 125 | 106 | 2 |
| Exam date | 0ctober 2007 | October 2008 | December 2008 |
| Exam media: Delivery/collection | CD/USB | CD/USB | USB/USB |
| Students using own Laptops | 0 | 6 | 0 |
| Exam type | Single document (edited in Open Office Writer) | PDF for questions; Open Office Writer document for respon-ses. Ogg Vorbis video, PowerPoint student work sample, Word curriculum document. | PDF for questions; Open Office Writer document for respon-ses. Ogg Vorbis video (Vorbis.com, undated) |
| Proportion reporting technical difficulties in the Examination | 23% | 56% | 0% |

Table 1 group of student undertaken the e exams

However, students who had previously taken a computer based exam preferred this medium (63% of respondents) compared with 37% of first-timers. The one way ANOVA confirmed a very significant difference due to prior computer exam experience with $F(2,227) = 8.683$, $p<.001$ with an effect size of 0.621. Thus a first experience of e-Examinations appears to stimulate a preference for computer based entrance examinationing, and is more significant than any subsequent technical difficulties.

In 2007 the examination consisted of a single document containing questions with spaces under each for student responses. We had two computer 'lockups', but both candidates had been able to resume after a restart, losing none of their work. In designing the 2008 e-Examination, we realized students might inadvertently edit the questions, so prepared these as a separate PDF file. In

Addition we included a stimulus scenario video and PowerPoint student work

Sample. Inadequate entrance examinationing on the variety of computers failed to reveal the

Video playback did not silence internal computer speakers on some models

Despite using headphones, which disturbed other candidates? In addition,

The version of Open Office crashed when a PowerPoint file was closed – not

A good experience for students new to e-Examinations! These factors accounted

For many of the technical difficulties reported by Group B. Nearly one third of the

Students who reported other technical difficulties included the comment 'the system was slow to respond'. This is an effect of using a 'live' CD operating system since commands must be loaded from the optical media, and led to

The development of the variation used for Group C entirely based on a USB drive.

Other specific reports of

## 2.2 TECHNICAL DIFFICULTIES INCLUDED:

- I could not remember how to create a diagram

- Spelling issues – I kept touching the wrong keys

- AutoCorrect changed my words

## 2.3 OTHER GENERAL COMMENTS INCLUDED THE FOLLOWING

Sixteen students in Group A (12.8%) commented on the high noise level from Computer keyboards during the e-Examination, with notes such as:
Everyone in one room typing is LOUD! It was hard to concentrate.
The noise of the clicking [of keyboards] was very distracting. The sound makes You feel rushed. We warned Groups B and C about the problem of noise, and no students from these groups commented on this aspect of the e-Examination. However, the latter groups did express frustration about having to manipulate multiple windows: "It was frustrating going between several documents. It would be better if answers & question [were] in one document".
We are looking at the possibility of putting future e-Examinations in a single file with questions in a distinguishing colour and protected from editing. Focus group
Six students from Group B kindly agreed to participate in a focus group with two of the authors immediately after their e-Examination. It quickly became clear that in this small group there were students with opposing views about e-Examinations. The first speaker, Betty (pseudonyms have been used to preserve anonymity as required by our ethics approval), was supportive of using the computer, because she had more freedom of expression.

## 2.4 OTHER RELATED WORKS INCLUDE

## 2.5 COMPUTER ASSISTED LEARNING

Computer Assisted Learning (CAL) has been a term of increasing significance during the last decade and can also be referred to as Computer Based Instruction (CBI), Computer Aided Learning (CAL), or Computer Aided Instruction (CAI) (Bachman, 1998). For the purpose of this review, we can simply define CAL as the learning procedures and environments facilitated through computers. However, the keyword for understanding Computer Assisted Learning is interaction. Computers can facilitate interaction during the learning process on multiple levels. On one level we have interaction of the student/user with the content and the learning material. On another level, computers can host interaction of the student/user with the tutor, peer interaction or interaction between members of whole ‘‘virtual’’ learning communities. The concept of interaction with content was first introduced in applications as early as the 1980’s and is probably the best studied aspect of Computer Assisted Learning (Hinman, 1996). Computers’ facilitation of interaction between humans, however, has only emerged during the last decade, as explosive technological progress and the Internet allowed reliable and inexpensive communication.

Computer mediated human-human interaction is a whole new area in Computer Assisted Learning, which presents special methodological considerations and requires separate study (Mattheos , 2000).

The present review will be focused on Computer Assisted Learning applications where interaction is limited between the user and the content, as the educational experience with these applications is wider, and their future prospects are also remarkable. These Computer Assisted Learning applications were initially

designed for local use as part of the traditional curriculum. However as both technology and educational experience mature, the real potential of these programs unfolds in distance learning. It is important to remark that although interactive Computer Assisted Learning programs are accessed from different places, they are directed by the same educational principles. For instance an ‘‘interactive computer maintenance’’ can be accessed through a CDROM in the university ICT lab supplementing the local curriculum, and the same application can be available on the web as part of a distance learning course. In both cases, the learning principles and methodological implications are identical, as long as the interaction remains between the user and the content. Therefore study of this kind of application even if in a local environment, is directly applicable to the use of Computer Assisted Learning in distance learning, where the future of the medium undoubtedly lies. The present study aims to summarize the current experience in the field of Computer Assisted Learning applications in computer hardware maintenance and trouble shooting. The review is particularly focused on educational value of Computer Assisted Learning, as well as its effectiveness in comparison to traditional teaching. In addition, we intend to investigate the attitude towards Computer Assisted Learning among the students, staff and professionals. Finally, visible future trends and developments in the field will be presented.

## 2.6 A BRIEF HISTORIC REVIEW

In the 1950s computer use was introduced in education. At that time multimedia did not exist as we know it today. Interaction with computers was available by means of slides and audiotapes. The computer mainframe was connected with terminals that were placed relatively far away from the main computer. The

computer was used as a knowledge-bank of questions by which students could undertake self-assessment of their knowledge (Wenzel , 1997). In the early 1970s the use of computers increased. The mainframes were very expensive and difficult to use. It was not until august 1981, when IBM presented the microcomputer IBM PC (personal computer) that the use of computers for educational purpose started to develop.

One of the first CAL programs in dentistry was developed by Luffingham in 1984. He used an Apple II 48K PC to control a videotape and allow students to answer simple multiple-choice questions. His conclusion from this study was that CAL provided the student with a popular and effective way of learning (Lufingham, 1998). Computers have been used in clinical practice for about 15 years. In spite of this, few dental faculties have appropriately prepared the students for using programs and applications that are available for dental clinics (Fedman, 1992). There are today a number of CAL programs available on the market. However it seems that the development of CAL is based on the work of very few individuals rather than being a part of the faculty's ICT strategies (Plasschaert, 1995). The recent progress of communication technology and the wide introduction of the Internet have added a whole new dimension to CAL. Tools to gather information through the Internet provide great opportunities for searching literature and establishing fast communication with international resources. Contacts can be made with colleagues and resource persons in spite of geographical restrictions (Agis, 2000).

The Internet already hosts an increasing variety of programs and databases, making them available for effective and inexpensive distance learning to all kinds of dental students and professionals (Eaton, 2000). From on-line tutorials and entrance examinations to case studies, simulations and interactive patients (Hayes, 1996),

the ever-increasing number of available CAL applications on Internet has already shaped the future of the medium in oral health education. In addition, recent software and web design tools allow content experts to design high quality multimedia CAL packages, without the need of expensive technology or technical expertise. These developments are expected to boost CAL production even further. Therefore, evidence-based study and research on CAL in dental education and the relevant educational and methodological implications are urgently needed, if we are to utilize the full potential of the medium.

## 2.7 APPROACHES TO E-LEARNING SERVICES

E-learning services have evolved since computers were first used in education. There is a trend to move towards blended learning services, where computer-based activities are integrated with practical or classroom-based situations.

Bates and Poole (2003) and the OECD (2005) suggest that different types or forms of e-learning can be considered as a continuum, from no e-learning, i.e. no use of computers and/or the Internet for teaching and learning, through classroom aids, such as making classroom lecture PowerPoint slides available to students through a course web site or learning management system, to laptop programs, where students are required to bring laptops to class and use them as part of a face-to-face class, to hybrid learning, where classroom time is reduced but not eliminated, with more time devoted to online learning, through to fully online learning, which is a form of distance education. This classification is somewhat similar to that of the Sloan Commission reports on the status of e-learning, which refer to web enhanced, web supplemented and web dependent to reflect increasing intensity of technology use. In the Bates and Poole continuum, 'blended learning' can cover

classroom aids, laptops and hybrid learning, while 'distributed learning' can incorporate either hybrid or fully online learning.

It can be seen then that e-learning can describe a wide range of applications, and it is often by no means clear even in peer reviewed research publications which form of e-learning is being discussed. However, Bates and Poole argue that when instructors say they are using e-learning, this most often refers to the use of technology as classroom aids, although over time, there has been a gradual increase in fully online learning.

## 2.8 COMPUTER-BASED LEARNING

Computer-based learning, sometimes abbreviated to CBL, refers to the use of computers as a key component of the educational environment. While this can refer to the use of computers in a classroom, the term more broadly refers to a structured environment in which computers are used for teaching purposes. The concept is generally seen as being distinct from the use of computers in ways where learning is at least a peripheral element of the experience (e.g. computer games and web browsing) .

Computer-Based Trainings (CBTs) are self-paced learning activities accessible via a computer or handheld device. CBTs typically present content in a linear fashion, much like reading an online book or manual. For this reason they are often used to teach static processes, such as using software or completing mathematical equations. The term Computer-Based Training is often used interchangeably with Web-based training (WBT) with the primary difference being the delivery method. Where CBTs are typically delivered via CD-ROM, WBTs are delivered via the

Internet using a web browser. Assessing learning in a CBT usually comes in the form of multiple choice questions, or other assessments that can be easily scored by a computer such as drag-and-drop, radial button, simulation or other interactive means. Assessments are easily scored and recorded via online software, providing immediate end-user feedback and completion status. Users are often able to print completion records in the form of certificates.

CBTs provide learning stimulus beyond traditional learning methodology from textbook, manual, or classroom-based instruction. For example, CBTs offer user-friendly solutions for satisfying continuing education requirements. Instead of limiting students to attending courses or reading printing manuals, students are able to acquire knowledge and skills through methods that are much more conducive to individual learning preferences. For example, CBTs offer visual learning benefits through animation or video, not typically offered by any other means.

CBTs can be a good alternative to printed learning materials since rich media, including videos or animations, can easily be embedded to enhance the learning. Another advantage to CBTs are that they can be easily distributed to a wide audience at a relatively low cost once the initial development is completed.

However, CBTs pose some learning challenges as well. Typically the creation of effective CBTs requires enormous resources. The software for developing CBTs (such as Flash or Adobe Director) is often more complex than a subject matter expert or teacher is able to use. In addition, the lack of human interaction can limit both the type of content that can be presented as well as the type of assessment that can be performed. Many learning organizations are beginning to use smaller

CBT/WBT activities as part of a broader online learning program which may include online discussion or other interactive elements.

## 2.9 COMPUTER-SUPPORTED COLLABORATIVE LEARNING (CSCL)

Computer-supported collaborative learning (CSCL) is one of the most promising innovations to improve teaching and learning with the help of modern information and communication technology. Most recent developments in CSCL have been called E-Learning 2.0, but the concept of collaborative or group learning whereby instructional methods are designed to encourage or require students to work together on learning tasks has existed much longer. It is widely agreed to distinguish collaborative learning from the traditional 'direct transfer' model in which the instructor is assumed to be the distributor of knowledge and skills, which is often given the neologism E-Learning 1.0, even though this direct transfer method most accurately reflects Computer-Based Learning systems (CBL).

In *Datacloud: Toward a New Theory of Online Work*, Johndan Johnson-Eilola describes a specific computer-supported collaboration space: The Smart Board. According to Johnson-Eilola, a "Smart Board system provides a 72-inch, rear projection, touchscreen, intelligent whiteboard surface for work". In *Datacloud*, Johnson-Eilola asserts that "[w]e are attempting to understand how users move within information spaces, how users can exist within information spaces rather than merely gaze at them, and how information spaces must be shared with others rather than being private, lived within rather than simply visited". He explains how the Smart Board system offers an information space that allows his students to engage in active collaboration. He makes three distinct claims regarding the functionality of the technology: 1) The Smart Board allows users to work with

large amounts of information; 2) It offers an information space that invites active collaboration, 3)The work produced is often "dynamic and contingent". Johnson-Eilola further explains that with the Smart Board "…information work becomes a bodied experience". Users have the opportunity to engage with—inhabit—the technology by direct manipulation. Moreover, this space allows for more than one user; essentially, it invites multiple users.

## 2.10 TECHNOLOGY-ENHANCED LEARNING (TEL)

Technology enhanced learning (TEL) has the goal to provide socio-technical innovations (also improving efficiency and cost effectiveness) for e-learning practices, regarding individuals and organizations, independent of time, place and pace. The field of TEL therefore applies to the support of any learning activity through technology.

Along with the terms *learning technology*, *instructional technology*, and Educational Technology, the term is generally used to refer to the use of technology in learning in a much broader sense than the computer-based training or *Computer Aided Instruction* of the 1980s. It is also broader than the terms *Online Learning* or *Online Education* which generally refer to purely web-based learning. In cases where mobile technologies are used, the term M-learning has become more common. E-learning, however, also has implications beyond just the technology and refers to the actual learning that takes place using these systems.

E-learning is naturally suited to distance learning and flexible learning, but can also be used in conjunction with face-to-face teaching, in which case the term Blended learning is commonly used. E-Learning pioneer Bernard Luskin argues

that the "E" must be understood to have broad meaning if e-Learning is to be effective. Luskin says that the "e" should be interpreted to mean exciting, energetic, enthusiastic, emotional, extended, excellent, and educational in addition to "electronic" that is a traditional national interpretation. This broader interpretation allows for 21st century applications and brings learning and media psychology into the equation.

In higher education especially, the increasing tendency is to create a Virtual Learning Environment (VLE) (which is sometimes combined with a Management Information System (MIS) to create a Managed Learning Environment) in which all aspects of a course are handled through a consistent user interface standard throughout the institution. A growing number of physical universities, as well as newer online-only colleges, have begun to offer a select set of academic degree and certificate programs via the Internet at a wide range of levels and in a wide range of disciplines. While some programs require students to attend some campus classes or orientations, many are delivered completely online. In addition, several universities offer online student support services, such as online advising and registration, e-counseling, online textbook purchase, student governments and student newspapers.

E-Learning can also refer to educational web sites such as those offering learning scenarios, worksheets and interactive exercises for children. The term is also used extensively in the business sector where it generally refers to cost-effective online training.

The recent trend in the e-Learning sector is screen casting. There are many screen casting tools available but the laentrance examination buzz is all about the web based screen casting tools which allow the users to create screen casts directly

from their browser and make the video available online so that the viewers can stream the video directly. The advantage of such tools is that it gives the presenter the ability to show his ideas and flow of thoughts rather than simply explain them, which may be more confusing when delivered via simple text instructions. With the combination of video and audio, the expert can mimic the one on one experience of the classroom and deliver clear, complete instructions. From the learner's point of view this provides the ability to pause and rewind and gives the learner the advantage of moving at their own pace, something a classroom cannot always offer.

## 2.11 COMPUTER AIDED LEARNING VERSUS TRADITIONAL EDUCATION

When a case is presented in a book, all the learning material is presented linearly, frequently together with a subsequent solution to the case. Often the book begins from an already given topic. This principle is also frequently used in lectures: usually the student gets the solution without any interaction with the teacher or content.

Traditional book and lecture teaching represents a one-way communication with the student. Neither of these resources often stimulates the student. This implies that there is limited possibility for interaction with the resources. CAL, on the other hand, stimulates the student to interactive learning by providing the possibility for interaction with the media, at a personally chosen level. For instance, many of the programs often demand that the student ask for relevant information about the current situation in order to be able to continue. CAL also provides the student with the opportunity to go through the material at his own pace and repeat chosen

parts, without involving a teacher or other students. CAL is especially valuable when the program contains possibilities of direct contact with on-site teachers.

Students want to achieve as good assessments and grades as possible. Because of this, students are usually strategic and use different kinds of learning approaches to different courses, often in sophisticated ways. One important factor is the design of the exam. Depending on the examination form, students employ different learning styles (Hendricson, 1987). Additionally, when the time for examination is approaching, students often pass from a deeper understanding of the content to a pure memorizing mode (Fairclough, 1995). Students' learning strategies are often content-dependent (Laurillard, 1979). There is sometimes a strong correlation between the quantity of necessary activity and the quality of learning. The more that is demanded from students, the more likely they will adapt a superficial learning style (Chambers, 1992). In a study done on Nordic dental faculties, many students (54%–77%) thought they had little time available for studying. The students also considered that the teachers had deficient teaching skills. Many students felt that teaching was a second priority for the teachers (Widstrom, 1990). One reason for negative student attitudes is that sometimes the teaching staff in universities have had limited pedagogic education. Students usually wish for more factual and concrete information, a more structured curriculum and organized conditions (Hendricson, 1987). In other words, things should not be left to chance. One of the most popular learning resources is teacher handouts (Hendricson, 1987). Even small changes in how the information is presented can lead to major alterations in learning outcomes (Maclachan, 1986).

Research results show that if an image is initially blurry, and then becomes clear, it is remembered much better than if it is presented clearly for the same amount of time. This could mean that if an image were to be drawn instead of being instantly

presented, learners might remember it better. It has also been shown that learners have an ability to remember animations well (Maclachan, 1986). Interactive multimedia software engages students in decision-making and multi-sensory learning. When all senses are stimulated, learning will be most effective and the student more interested.

It has even been shown that if the computer grants the student an award (e.g. in form of an animated writing of his name), the student will try to perform better (Maclachan, 1986).

A computer can, in a very realistic way, simulate real problems. To be able to go farther in a simulation program, the student has to ask for relevant information about the case. This demands that the student be attentive and concentrate, which provides conditions for good learning (Maclachan, 1986). Students willingly use sophisticated instruments for learning (Plasschaert, 1995). In addition, if they participate in the development of the software, they will become more motivated to use it. Software that is developed by the faculty contains structured, actual and concrete information and is more likely to contain exam-relevant material. Since students adapt a learning style which favours the exam results when practicing cases, they will be more motivated to use this software. The software is designed in a way that ‘‘forces’’ the student to think and concentrate toward the faculty learning objectives, thus stimulating deeper thinking.

## 2.12 FACULTY AND STUDENT FEEDBACK

This implementation of an online exam is the first time the instructor ever utilized any exam other than a traditional paper and pencil exam taken with a proctor to

oversee the students completing the exam. The instructor indicated the following concerns to the use of an online exam:

- Cheating
- Reliability of technology
- Ease of use for instructor
- Ease of use for students
- Student satisfaction with online exam

***Cheating***. The biggest concern for use of an online exam is cheating. With the paper and pencil exam, students are constantly monitored to assure that each student is taking the exam without the assistance of other individuals. By putting the exam online and allowing the students to take the exam at their leisure creates an opportunity for students to get assistance on the exam. The instructor addressed this concern by using a random exam so that each student has a completely different exam so students cannot share answers. The instructor does acknowledge that the random exam does not completely address the issue and the instructor must use the honor system to hope that students do not cheat.

***Reliability of technology***. The professors indicated that they did have a fear of the reliability of the technology. In order for the students to complete the exam online the students must have access to the internet and log into blackboard. The implementation of the online exam using blackboard allowed to professor the option of using a randomized entrance examination so that every student got a unique entrance examination. From the professor's perspective the technology proved to be very reliable although three students had problems they were not due to the technology being unreliable.

***Ease of use for instructor.*** The textbook used by the professor provided a entrance examinationbank that was compatible with blackboard. This allowed the entrance

examinationbank to be quickly and easily uploaded. The exam can then be created in blackboard with a variety of options. The instructor was able to use the following options on the entrance examination:

- Forced completion (students had to complete in one sitting)
- Scheduled availability for the exam
- Number of questions from each chapter
- Total number of questions on the exam
- Time limit for the exam
- Random questions for each student
- Immediate scoring reported to students.

The instructor reported that these options were very easy to incorporate into the exam. The instructor also had the ability to reset an exam and receive statistics including amount of time each student took to take the exam and their scores on the exam throughout the exam as well as at the end of the exam time period.

***Ease of use for students***. Students are becoming more and more proficient in the use of technology as jobs are now requiring these skills to meet the demands of their everyday job. Three students reported technological problems during the exam.

One indicated that when he submitted the exam he received a message stating that not all questions had answers and did he want to review before submitting but when he reviewed the exam all questions had answers so he submitted anyway. He notified the instructor and the instructor verified that all questions did indeed have answers. When surveying the students after the exam, several students had the same problem. The exam is designed so that a student can save after every question or wait until the end of the exam and save. Several students started saving after

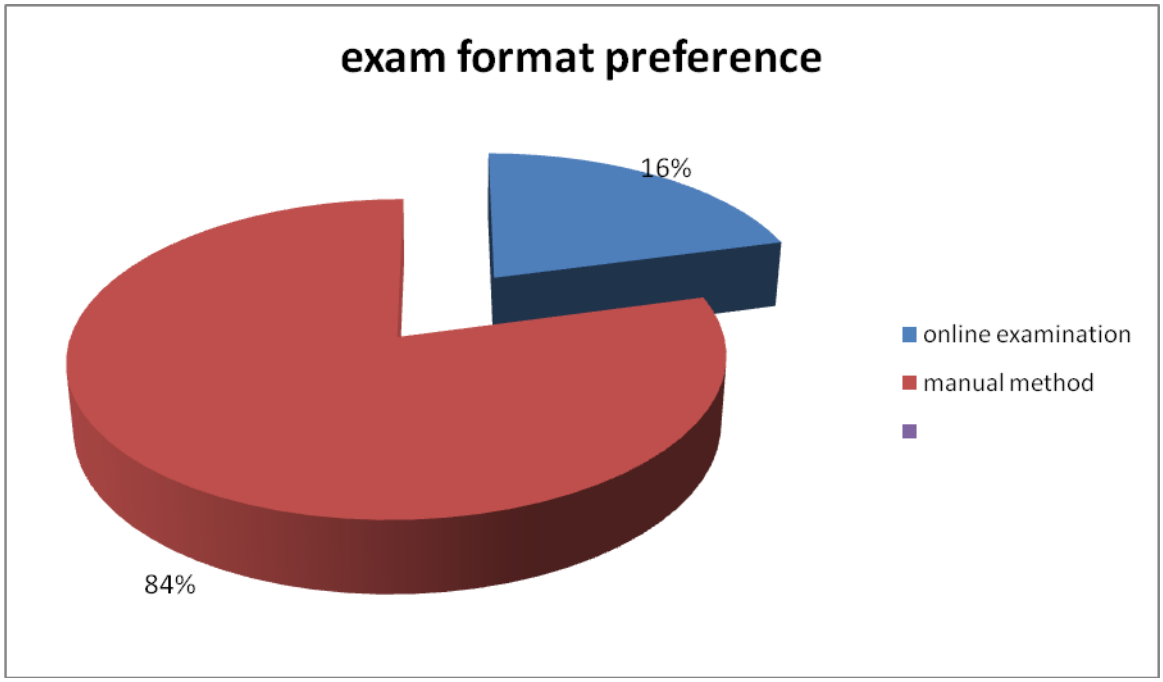
each question but when this proved to be extremely time consuming stopped and opted to just save at the end. These are the students that received the missing answer message. The students that saved after each and every question or only at the end did not receive the message.

One student reported that the exam stopped timing her session in the middle of the exam. She therefore indicated that she used the honor system and timed herself to assure she did not go over the three hour time limit. Although, the instructor was not able to determine what caused the student to feel that the timer had stopped, the instructor verified that the timer did in fact work.

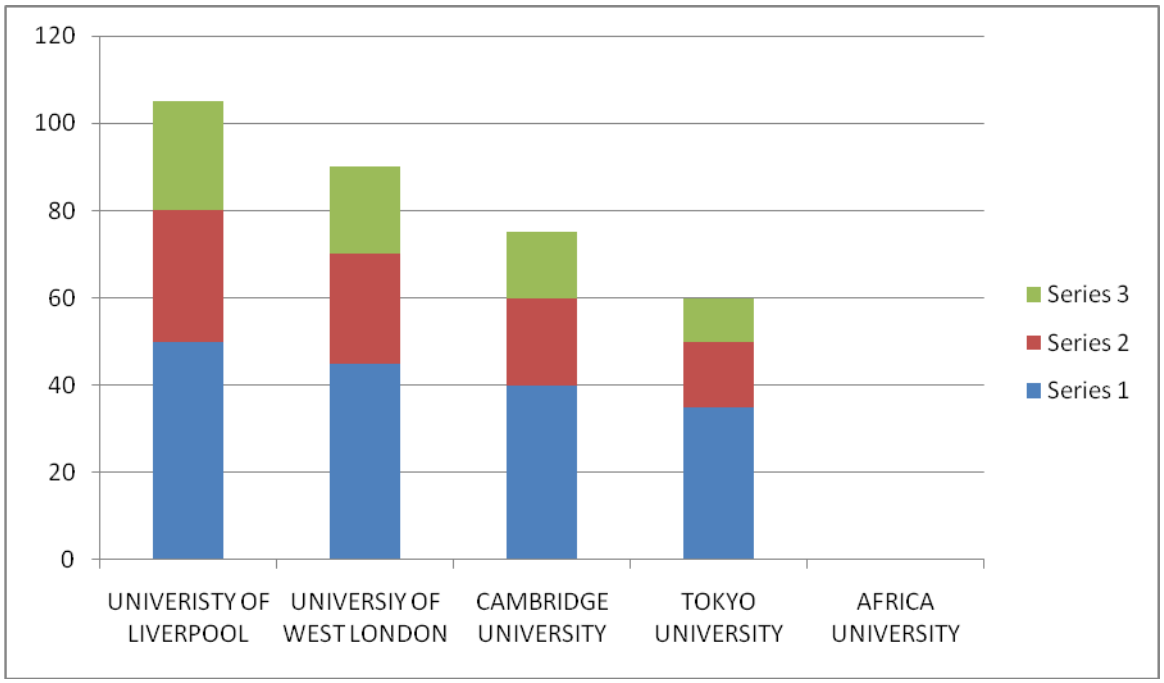
The final student had an actual problem taking the exam. While taking the exam the student navigated away from the exam thus preventing her ability to finish the exam. Using the computer for anything else while in the middle of the exam ends the exam session. This aspect although unexpected provides extra reassurance to the instructor that students have fewer opportunities to cheat by access the internet during the exam. With this new knowledge, students can be warned so that they know not to navigate away from the site during the exam. In this case, the instructor was not able to give the student access to the exam she had in progress but was able to reset the

Exam and the student were able to retake the exam from the beginning.

**Student Satisfaction.** Students were surveyed after completion of both the midterm and Final Exam. Of the forty-nine students, an overwhelming forty-one, eighty-four percent, indicated that not only would they like to take an exam online again they stated they would actually prefer it. The other eight students indicated they prefer the traditional paper and pencil exam in a monitored prescheduled setting (see Figure 5



COMPARISON OF ONLINE ENTRANCE EXAMINATION USAGE IN UNIVERITIES




From the chart, it can be seen that Africa University has not adopted the technology of online entrance examination as result they face certain difficulty in Administration of exams manually to student.

With the rapid growth of online technology for daily use soon online technology system would be employed in private establishment for the conduct of their interview exams.

# CHAPTER THREE

## 3.0 METHODOLOGY AND ANALYSIS OF THE PRESENT SYSTEM

## 3.1 THE RESEARCH METHODOLOGY

It has been established that physical achieves are not always helpful a much better alternative is to use automated base examination scheduler.

This implies the creation of database management system (DBMS) which ensure that computer records are kept up to date and made available on demand to those who need them for planning and operational purpose. The level of success achieved in caring out this research work is owed to the methodology adopted.

A research methodology is a systematical programming approach of a well defined procedure that should be followed in caring out a thorough research work .an adequately suitable methodology would

Ensure a very detail research work and ensure a higher degree of accuracy and efficiency is adopted.

In other to attain quiet a reasonable acceptance of the research work we made use of the internationally accepted software engineering model, which is

**Structured System Analysis And Design Methodology. (SSADM).**

The (SSADM) is a system approach` to the analysis and design of information system. it involves the application of a sequence of analysis, documentation and design tasks concern with the analysis of the current system logical data design ,logical process design, etc. The research methodology used helps us to ensure that a thorough study of the present system is effectively carried out thus helping the project research team to completely understand the modus operandi of the present system so as to know how to the new system should be structured and the

functionalities needed in it to address the seemingly existing problems discovered. This helps to know if there should be total overhauling of the existing system or if only modification should be made. From the research carried out the existing system is a manual system which gives the option of overhauling the manual system the SSADM is adopted to create entirely a new system.

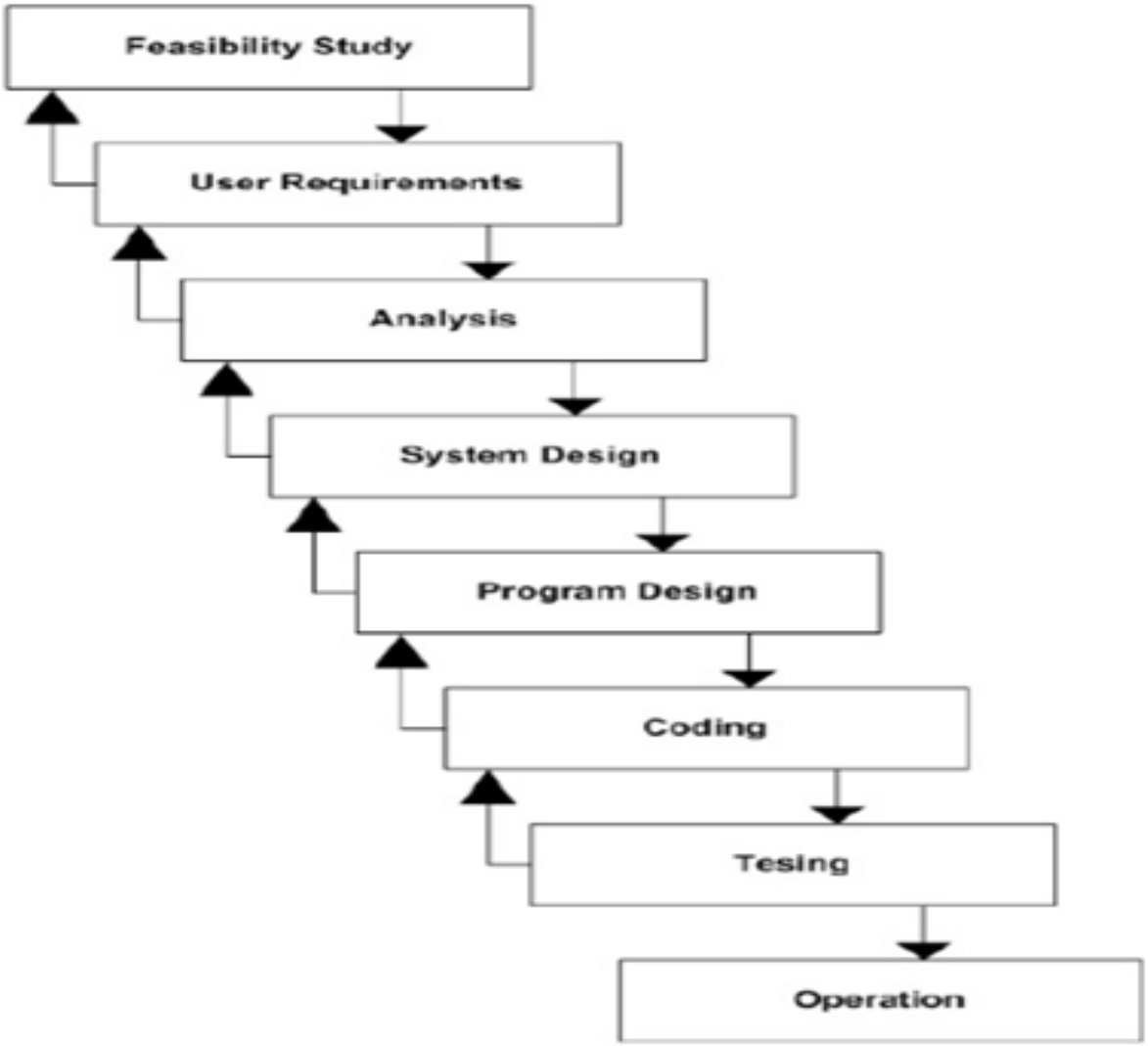
## 3.2 SOFTWARE PROCESS MODEL:

To solve an actual problems in an industry, software developer or a team of developers must integrate with a development strategy that include the process, methods and tools layer and generic phases. This strategy is often referred to a process model or a software developing paradigm.

Our project follows the **waterfall model.**

**The steps of waterfall model are:**

- Requirement Definition
- System and Software Design
- Implementation
- Integration and System Entrance examinationing
- Operation and Maintenance



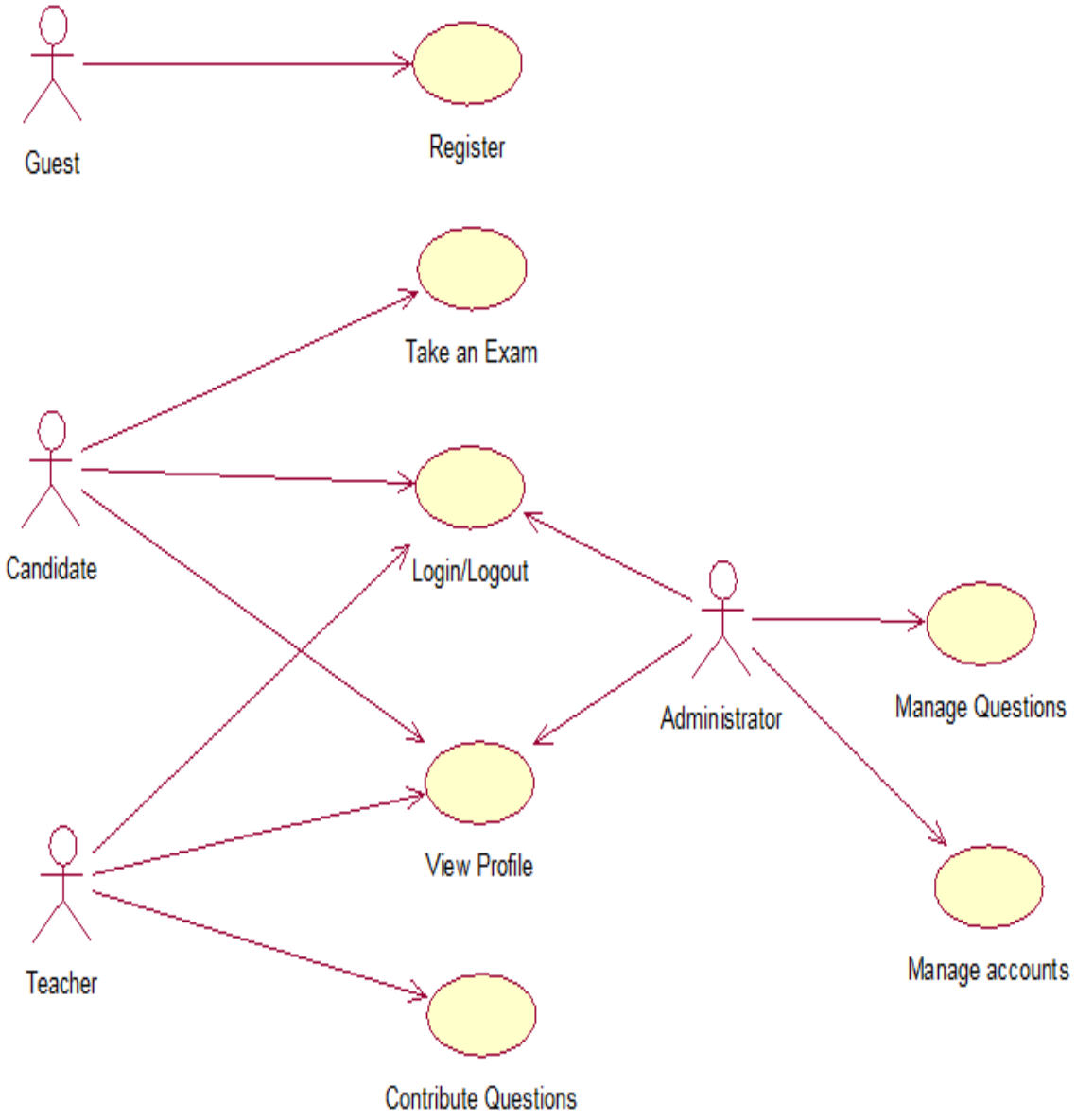

## 3.3 METHOD OF DATA COLLECTION

Having achieved the software requirements, the next step was to source for information relative to the subject. This process of information gathering was achieved through so many sources including:

- File downloads from the Internet
- Textbooks in the library
- Newspaper, Journals and articles of school publication
- Other publications relative to other universities and their development

- Personal observations of the examination in the school system.

## 3.4 ONLINE ENTRANCE EXAMINATION USE-CASE MODEL MAIN DIAGRAM



## Register

### Brief description

This user-case describes the case people register as a member of the site.

### Flow of Events

#### *Basic flow*

1. This user-case starts when a guest register as a member of Online Examination System
2. The actor (guest) enters his/her information
3. The system validates his/her information
4. The system create new account according to the information which have received

#### *Alternative flows*

*Invalid information*

If, in the basic flow, the actor enters invalid information, the system displays error messages.

### Special Requirements

None.

### Pre-Conditions

The system is not in the logged-in state.

### Post-Conditions

If the use case was successful, new account is created and the successful registration should be informed. If not, the system state is unchanged.

**Extension Points**

None.

**Manage Accounts**

**Brief Description**

This use case describes how the Administrator manages questions in Online Examination System such as delete, reset passwords.

**Flow of Events**

***Basic flow***

This use case starts when the Administrator wishes to delete, ban accounts or reset passwords

1. The system requests that the Administrator specify the account needed to be changed

2. Once the account is located, one of the sub flows is executed.

If the Administrator selected “Deletethisaccount”, the “Delete account” sub flow is executed.

If the Administrator selected “Reset password”, the “Reset password” sub flow is executed.

***Sub flows:***

*Delete an Account*

1. The system should be confirmed by the Administration
2. The system removes this account from the database.

*Reset password*

1. The system should be confirmed by the Administration
2. New password will be sent to the account's mail

**Alternative flows**

None

**Special Requirements**

None.

**Pre-Conditions**

The Administration must logged in.

**Post-Conditions**

The account must be changed correctly.

**Extension Points**

None.

**Login**

**Brief Description**

This use case describes how a user logs into the Online Examination System.

**Flow of Events**

*Basic Flow*

This use case starts when the actor wishes to log into the Online Examination System.

1. The actor enters his/her name and password.

2. The system validates the entered name and password and logs the actor into the system.

*Alternative Flows*

Invalid Name/Password

If, in the Basic Flow, the actor enters an invalid name and/or password, the system displays an error message. The actor can choose to either return to the beginning of the Basic Flow or cancel the login, at which point the use case ends.

**Special Requirements**

None.

**Pre-Conditions**

The system is in the login state and has the login screen displayed.

**Post-Conditions**

If the use case was successful, the actor is now logged into the system. If not, the system state is unchanged.

**Extension Points**

None.

**Logout**

**Brief Description**

This use case describes how a user logs out the Online Examination System.

**Flow of Events**

*Basic flow*

This use case starts when the actor wishes to log out the Online Examination System.

The actor click the “Logout” button.

*Alternative flow*

None.

**Special Requirements**

None.

**Pre-Conditions**

The system is in the logout state and has the logout button on the screen.

**Post-Conditions**

If the use case was successful, the actor is now logged out the system. If not, the system state is unchanged.

**Extension Points**

None.

**Manage Question**

**Brief Description**

This use case describes how the Administrator manage questions in Online Examination System such as add, edit or delete question.

**Flow of Events**

Basic flow

This use case starts when the Administrator wishes to add, change, and/or delete question in the system.

1. The system requests that the Administrator specify the function he would like to perform (either add a question, Update a question, or Delete a question)

2. Once the Administrator provides the requested information, one of the sub flows is executed.

If the Administrator selected “Add a question”, the Add a question subflow is executed.

If the Administrator selected “Update a question”, the Update a question subflow is executed.

If the Administrator selected “Delete a question”, the Delete a question subflow is executed.

***Add a question***

The system requests that the Administrator enter the question. This includes:

- Question
- Number of choice
- Answer for each choice
- Correct answer
- Time for question

1. Once the Administrator provides the requested information, the system generates and assigns a unique id number to the question. The question is added to the system.

2. The system provides the Administrator with the new question id.

***Update a question***

1. The system requests that the Administrator enter the question id.

2. The Administrator enters the question id. The system retrieves and displays the question information.

3. The Administrator makes the desired changes to the question information. This includes any of the question information specified in the Add a question sub-flow.

4. Once the Administrator updates the necessary information, the system updates the question record.

***Delete a question***

1. The system requests that the Administrator enter the question id

2. The Administrator enters the question id. The system retrieves and displays the question information.

3. The system prompts the Administrator to confirm the deletion of the question.

4. The Administrator verifies the deletion.

5. The system deletes the question from the system.

Alternative Flows

***Question Not Found***

If, in the Update a question or Delete a question sub-flows, a question with the specified id number does not exist, the system displays an error message. The Administrator can then enter a different id number or cancel the operation, at which point the use case ends.

***Delete Cancelled***

If, in the Delete A Question sub-flow, the Administrator decides not to delete the question, the delete is cancelled, and the Basic Flow is re-started at the beginning.

**Special Requirements**

None.

**Pre-Conditions**

The system is in the manage question state and has the manage question screen displayed.

**Post-Conditions**

If the use case was successful, the actor is now added, edited or deleted questions in the system. If not, the system state is unchanged.

**Extension Points**

None.

**Take exam**

**Brief Description**

This use case describes how a user takes an exam in the Online Examination System.

**Flow of Events**

*Basic Flow*

This use case starts when the participation wants to take an exam in the Online Examination System.

1. The participation enters one of these subjects like (mathematic, chemical, physical…).

2. The system returns a new exam of this subject for participation starting do exam.

3. The participation chooses one answer in the multiple choices question.

4. The participation submits his/her answer when finishing exam.

5. The system returns a result for his/her answer and return to beginning of exam.

*Alternative Flows*

Invalid subject

If, in the Basic Flow, the participation doesn't submit his/her answer when time is up, the system automatically displays a result message of this exam and return to the beginning of basic flow.

**Special Requirements**

None.

**Pre-Conditions**

The system is in the exam state and has the exam screen displayed.

**Post-Conditions**

If the use case was successful, the participation is starting an exam. If not, the system state returns to choosing a subject for exam state.

**Extension Points**

None.

**Contribute Questions/Answers**

**Brief description**

This use case allows a teacher/contributor to contribute new questions/answers. The contributed questions/answers then are verified and classified by system moderators and if they meet the standards they are added to system question bank.

**Flow of Events**

*Basic flow*

This use case starts when a teacher/contributor start contributing questions/answers to the system.

1. The system checks if the current user has sufficient right to contribute questions/answers to system. If that user has the right, then he/she can continue contributing questions/answers otherwise the user will receive an error message.
2. User chooses the questions attributes such as: category, difficulty level, oriented candidates, etc… After that, user enters formatted questions and answers into forms, add some details/comments about his/her questions and answers.
3. User submits the questions/answers and receives a system message telling that the questions/answers are being queued, waiting for verification.
4. User is prompted to continue contributing question or leave this page. If user chooses continue, then the system go back to step 2 in this process. If user chooses to go back to Home page then he/she is redirected to Home page.

**Special Requirements**

None.

**Pre-conditions**

User must be logged onto the system.

**Post-conditions**

If users successfully complete contributing questions/answers then those data are queued for system moderator to verify. Otherwise, the system remains unchanged and all temporary data are not saved.

**Extension Points**

None.

**View profile**

**Brief description:**

This use case allows a user and administrator view all information of user. Otherwise, user can be seen part of information of other user and that it is public user want to show. Furthermore, profile could update information automatic, and then it was save by controller system. Profile could edit, modify by that user or administrator.

**Flow of Events:**

1. Viewer should register to system. After that use must fill in all blanks flow requirements of this page and sure that is correct information.
2. All information will save by system and user can accept profile to update, change something if that is need.
3. System update information of profile into database and user, another user, administrator can be view the profile.

**Special Requirements:**

Viewer should declare correct email because system will send a mail to that email address. Viewer should accept email and click link to active account.

**Pre-conditions:**

User must be logged onto the system

**Post-conditions:**

None

**Extension Points:**

Change the password, avatar.

## 3.5 USER REQUIREMENTS DEFINITION:

The user requirement for this system is to make the system fast, flexible, less prone to error, reduce expenses and save the time.

- Time can be saved by scheduling the exams, if it is available a question bank to store questions for different subjects.
- A system can be given a mark by checking the students answers, and give the result as soon as students finish his exam.
- A facility to generate a result chart as pre required without manual interface.
- The system should have records of students and faculty that can be access to the system which can be used only for the authorized person.
- The system should be more secure for management user records and more reliable to work at any conditions.

## 3.6 THE PRODUCTS AND PROCESS FEATURES:

This system must be designed as user required. So, the complete requirement must be found:

- **Quick scheduling:**

  The system helps the faculty member to generate an automatic exam instead of using papers. Which save a time for writing, checking and for input marks. Also, student can see the exam when he login as an individual to the system.

- **Immediate results and solutions:**

  When the student finishes his exam, the system checks her answers and compared with the correct answer. And the system saves the incorrect and correct answers and calculates the mark of correct answers. Then give the total mark. And send a report for student to see where he is fault.

- **Easy to store and retrieve information:**

  Rather to save the information on a papers or in separate sheets. There are a data base management to store and retrieve the information needed by the administrator or Faculty member or student according a report generated by the system.

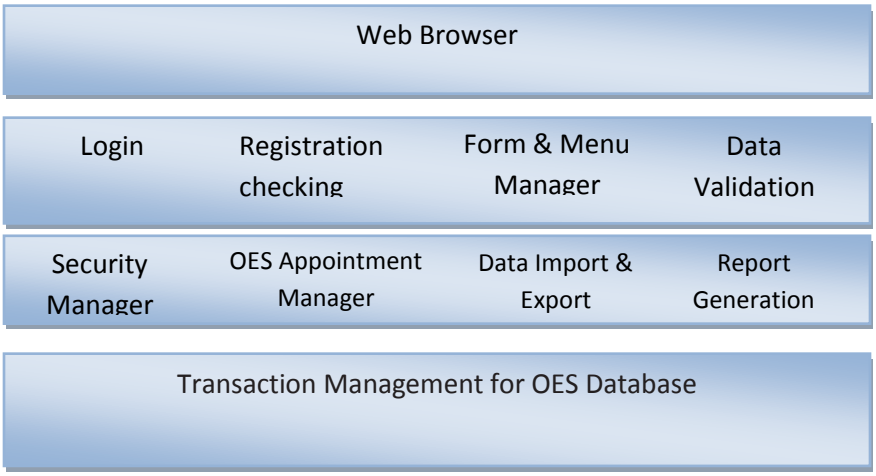



Figure (3.1): system architecture for OES

## 3.7 SYSTEM REQUIREMENT SPECIFICATION:

### Functional System Requirement:

This section gives a functional requirement that applicable to the On-Line Exam system.

There are three sub modules in this phase.

- Candidate module.
- Examiner module.
- Administrator module.

**The functionality of each module is as follows:**

- **Candidate module**: The candidate will logon to the software and take his examination. He can also check his previous marks and his details.

The candidate will get result immediately after the completion of the examination.

- **Examiner module:** The database is prepared & loaded into the software. Selection for examination can be done language wise by the examiner. The results will be displayed immediately after completion of the examination.
- **Administrator module:** The administrator collects all the results after successful completion of the examination and sends to the head quarters as and when required.

## 3.8 THE FEATURES THAT ARE AVAILABLE TO THE ADMINISTRATOR ARE:

- The administrator has the full fledged rights over the OES.
- Can create/delete an account.
- Can view the accounts.
- Can change the password.
- Can hide any kind of features from the both of users.
- Insert/delete/edit the information of available on OES.
- Can access all the accounts of the faculty members/students.

## 3.9 THE FEATURES AVAILABLE TO THE STUDENTS ARE:

- Can view the different categories of Entrance examination available in their account.

- Can change password.
- Can view their marks.
- Can view the various reading material.
- Can view and modify its profile but can modify it to some limited range.

## 3.10 THE FEATURES AVAILABLE TO THE EXAMINER ARE:

- Can view the different categories of Entrance examination conducted by users.
- Can change password.
- Can view their marks.
- Can view and modify Results.

## 3.11 NON-FUNCTIONAL SYSTEM REQUIREMENTS:

**Performance Requirements**

Some Performance requirements identified is listed below:

- The database shall be able to accommodate a minimum of 10,000 records of students.
- The software shall support use of multiple users at a time.
- There are no other specific performance requirements that will affect development.

## *3.12 SAFETY REQUIREMENTS*

The database may get crashed at any certain time due to virus or operating system failure. Therefore, it is required to take the database backup.

## *3.13 SECURITY REQUIREMENTS*

Some of the factors that are identified to protect the software from accidental or malicious access, use, modification, destruction, or disclosure are described below. Keep specific log or history data sets

- Assign certain functions to different modules
- Restrict communications between some areas of the program
- Check data integrity for critical variables
- Later version of the software will incorporate encryption techniques in the user/license authentication process.

Communication needs to be restricted when the application is validating the user or license. (i.e., using https).

## 3.14 SOFTWARE QUALITY ATTRIBUTES

The Quality of the System is maintained in such a way so that it can be very user friendly to all the users.

The software quality attributes are assumed as under:

- Accurate and hence reliable.
- Secured.
- Fast speed.
- Compatibility.

## 3.15 SYSTEM INTERFACES:

This section describes how the software interfaces with other software products or users for input or output.

## *3.16* USER INTERFACE

Application will be accessed through a Browser Interface. The interface would be viewed best using 1024 x 768 and 800 x 600 pixels resolution setting. The software would be fully compatible with Microsoft Internet Explorer for version 6 and above. No user would be able to access any part of the application without logging on to the system.

## 3.17 HARDWARE INTERFACES

**Server Side:**

- Operating System: Windows 9x/xp ,Windows ME
- Processor: Pentium 3.0 GHz or higher
- RAM: 256 Mb or more
- Hard Drive: 10 GB or more

**Client side:**

- Operating System: Windows 9x or above, MAC or UNIX.
- Processor: Pentium III or 2.0 GHz or higher.
- RAM: 256 Mb or more

## *3.18 SOFTWARE INTERFACES*

- **Client Side:** .HTML, Web Browser, Windows XP/2000/Vista
- **Web Server:** .HTML, Windows XP/2000/Vista

## *3.19 COMMUNICATIONS INTERFACES*

The Customer must connect to the Internet to access the Website:

- Dialup Modem of 52 kbps

Broadband Internet Dialup or Broadband Connection with a Internet Provider.

## 3.20 SYSTEM MODELS:

In this system we are use waterfall model to apply these ideas. Which is help us to separate each step and when we finish a one phase the output of it is the input to the next phase. Also, we can backwards if there is a new requirement or to apply any update.

## 3.21 SYSTEM EVOLUTION:

- **Including image support:**

  Allow to adding students, faculty members and administrator images to the system. Which available for student to ensure that exam for his teacher. Also, the teacher can see his student's image.

- **Flags:**

  Allow the student to put a symbol near the question that helps the student to return and review the questions and change them accordingly.

- **Enable and disable exam:**

  Allow the faculty member to control for enable or disable the exam for his students.

- **Allow to transfer exam from one subject to another:**

  So, that saves the time to rewrite the questions for future course.

- **Allow to upload the exam from word or excel file:**

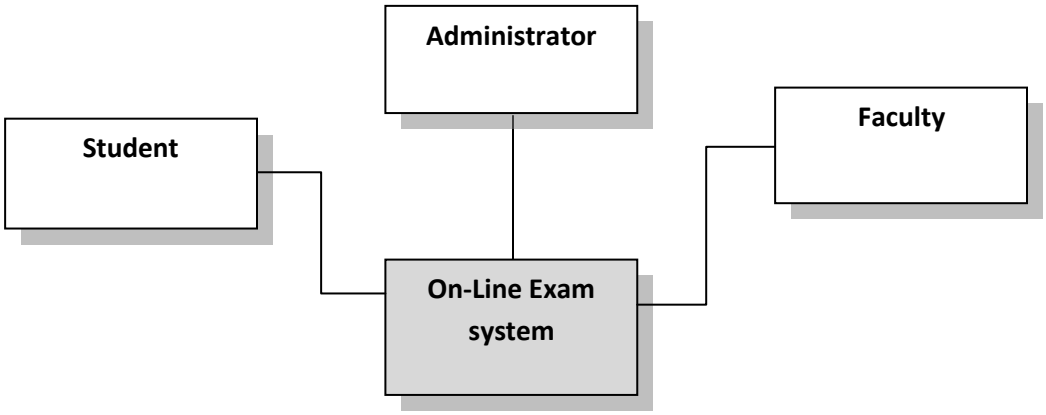
  So, that saves the time to enter a question in the on-line system, if the teacher needs not the direct answers.

- **Enhanced the questions to be appear as random for each student:**

  Make the order of questions as random, or select random questions from a set of questions.

## 3.22) CONTEXT DIAGRAM:

This diagram represents what are the bounders and scope of **On-Line Exam System** project. It describes the main objective of the system and its entities involved.




**The Administrator can be done the following:**

- Create/delete accounts (add a list of faculty names and list of his student)
- Change password for Faculty/Student
- Create/ delete/update courses (subject).

**The Faculty can be done the following:**

- Change password.

- Insert questions.
- Specify the answers.
- Update mark of questions and answers.

**The Student can be done the following:**

- Change password.
- Choose exam.
- Review answers.
- See his exam mark.
- View other material.

## 3.23) INTERACTION MODEL:

Is a dynamic model that shows how the system interacts with its environment. We use a data flow diagram.

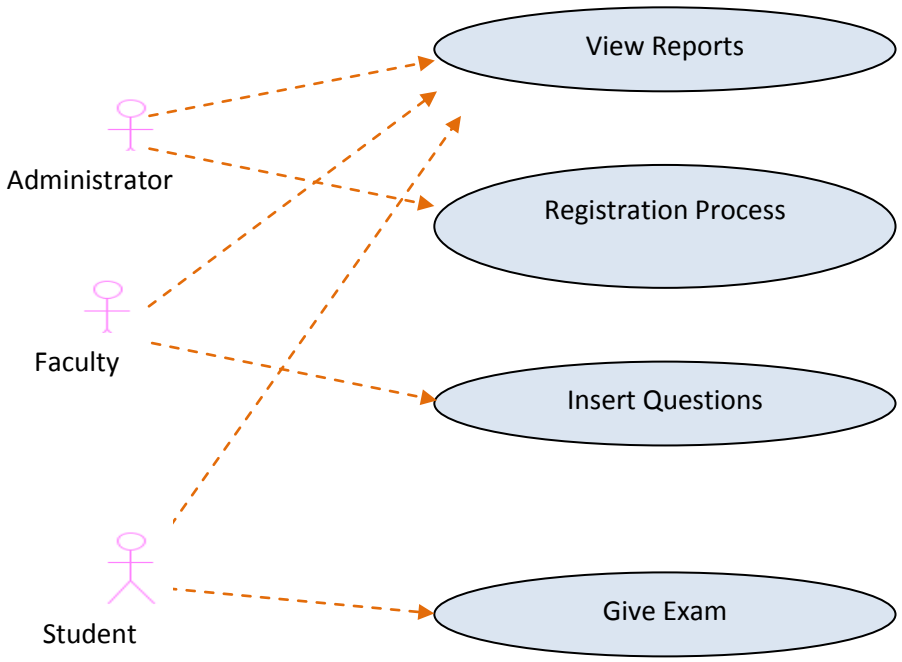
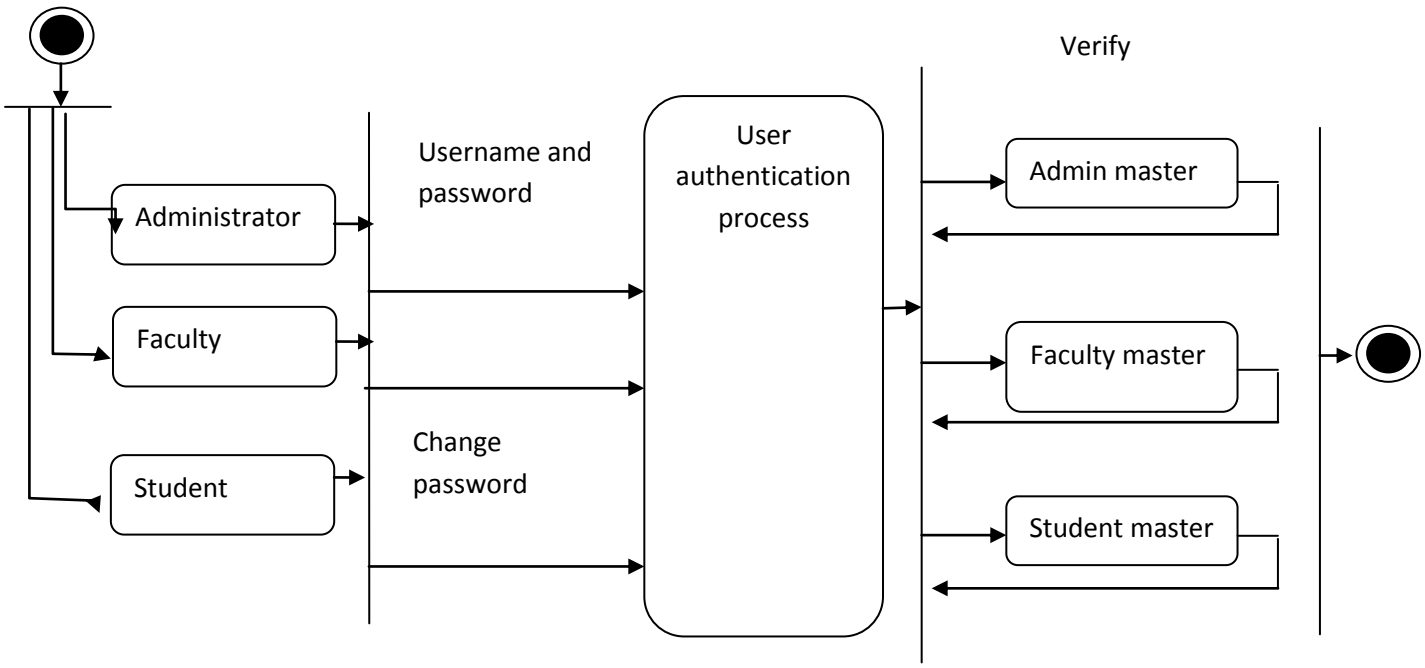



Figure (3.0): the basic function for each actor

DEVELOP DESIGN MODEL




**HOW IT WORKS**

**FOR THE CANDIDATE**

- Student across the globe can attend the Exams
- Time saving
- Candidate Console To take the Online entrance examination
- Less anxiety as the results can be known quickly
- Paper less exam

**FOR THE EXAMINER**

Exams Can be Conducted Globally

Easy & Quick Question Paper generation

Hassle free Frequent Exam conduction

Saves Time & Money

**Advantages of the proposed system**

**Communities and Groups:**

- The System provides a feature of creating communities and groups for organizations.
- Students and faculty of the organization can access the general subject entrance examinations.
- Privacy for organizations. Discussion forums:
- Feedbacks from the users
- Improvements suggested can be implemented
- Blogs are introduced for regular updates.

## ADVANCED FEATURES

- The examiner who uploads the questions gets an option of specifying whether the questions can be used for practice entrance examinations or not.
- Communities or groups can be formed for specific organizations.
- A variety of analysis options based on different parameters or combinations of different parameters for faculty/examiners conducting the entrance examination.
- Entrance examinationing and Management of the system are important advanced features that are offered by the proposed system. They are discussed as follows

**Results:**

- Students and instructors get instant results via e-mail. Results can also be printed as soon as the entrance examination finishes.
- Color Code for Question Status:
- Orange:
- Question seen but no any action (Review &Confirm)
- Not seen questions
- Green:
- Confirmed Answer
- Alerts: Reminders are set to alert examinee 10minutes before time expiry.

## DESCRIPTION OF THE EXISTING SYSTEM

The existing system makes use of manual method which involves pen and paper for the entrance examination. Entrance examination student are required to purchase their entrance form with the sum of #5500 from the school bank and return the receipt for the purchase of the form to the admin after which they would go into the hall and write their entrance examination under close supervision of

school admin officers. after the exams applicant student would have to come specific date for their result and admission status.

**Disadvantage of the existing system**

- Consume time and human labour
- Fear of being marked down by admin officers
- Delay in result
- Cost of purchase of question paper

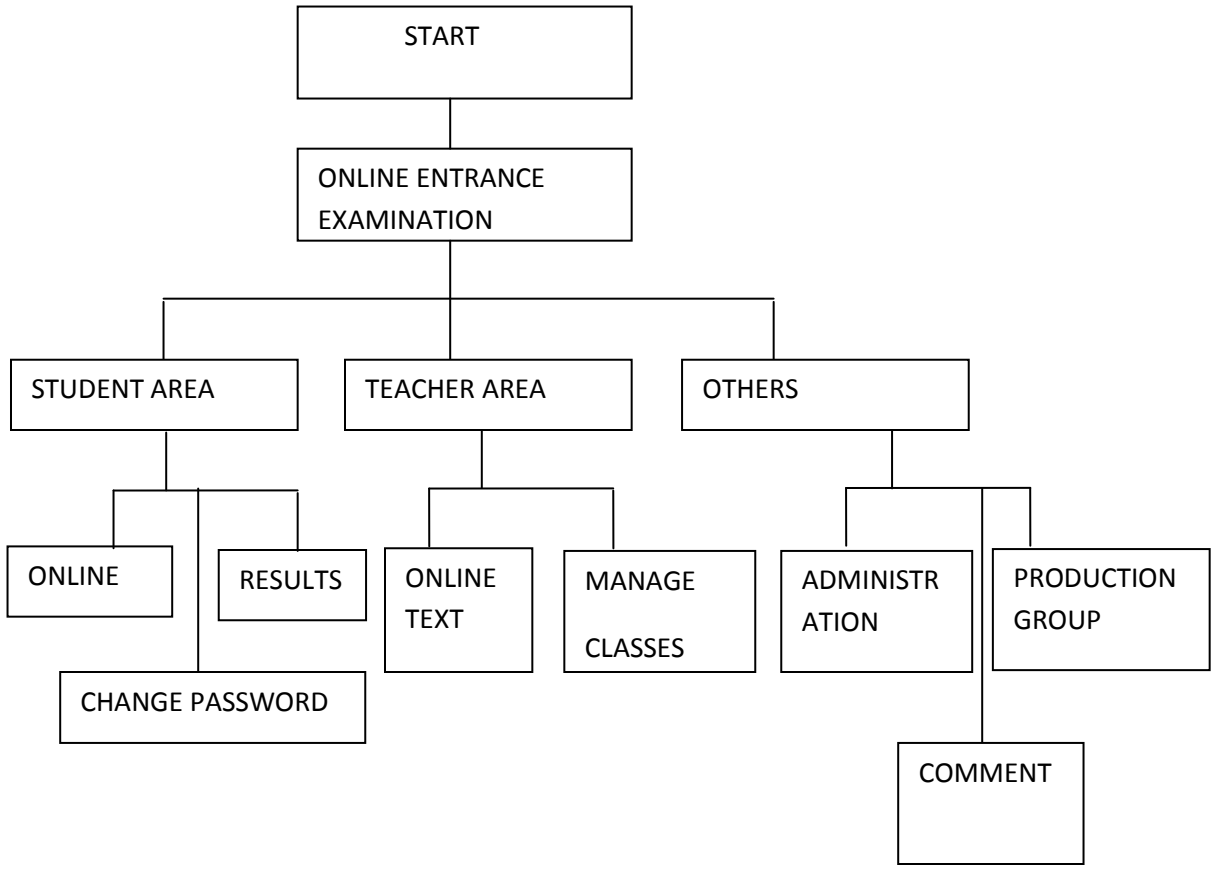
## CONTROL LIST OF THE SYSTEM

| **Control Type** | **Context Caption** | **Control ID** | **Function /Variable** |
|---|---|---|---|
| Dialog | Examination system basic exams | IDD_ENTRANCE EXAMINATIONSYS_Entrance examinational | |
| Group box | Exam context area | IDC_STATIC_Entrance Examination A_Context | |
| Edit control | | IDC_EDIT_Entrance Examination A_Context | m_strEntrance examination AContext |
| Group box | Answer area | IDC_STATIC_Entrance Examination Answer | |
| Button | Submit answer | IDC_STATIC_Entrance examination A_Submit | OnBnClickedBtnEntrance examinationa Sure( ) |
| Edit control | | IDC_EDIT_Entrance Examination A_Answer | m_strEntrance examinational Answer |
| Group box | Function choose area | IDC_STATIC_Entrance Examination A_FucOP | |
| Button | Previous question | IDD_ENTRANCE EXAMINATION SYS_Entrance Examinational | OnBnClickedBtn Entrance Examinational Ahead( ) |
| Button | Next question | | OnBnClickedBtnEntrance Examinational Next( ) |
| Group box | System operate Area | IDC_STATIC_Entrance Examinational_ SysOP | |
| Button | Submit score | IDOK | OnBnClickedOk( ) |

| | | | |
|---|---|---|---|
| Button | Cancel | IDCANCEL | OnBnClickedCancel( ) |
| Static text | Status view | IDC_STATIC_Entrance examinationA_Sel | m_strEntrance examinationASel |

## SYSTEM CHARACTERISTICS

The essential characteristics of the proposed online entrance examination system is as follows.



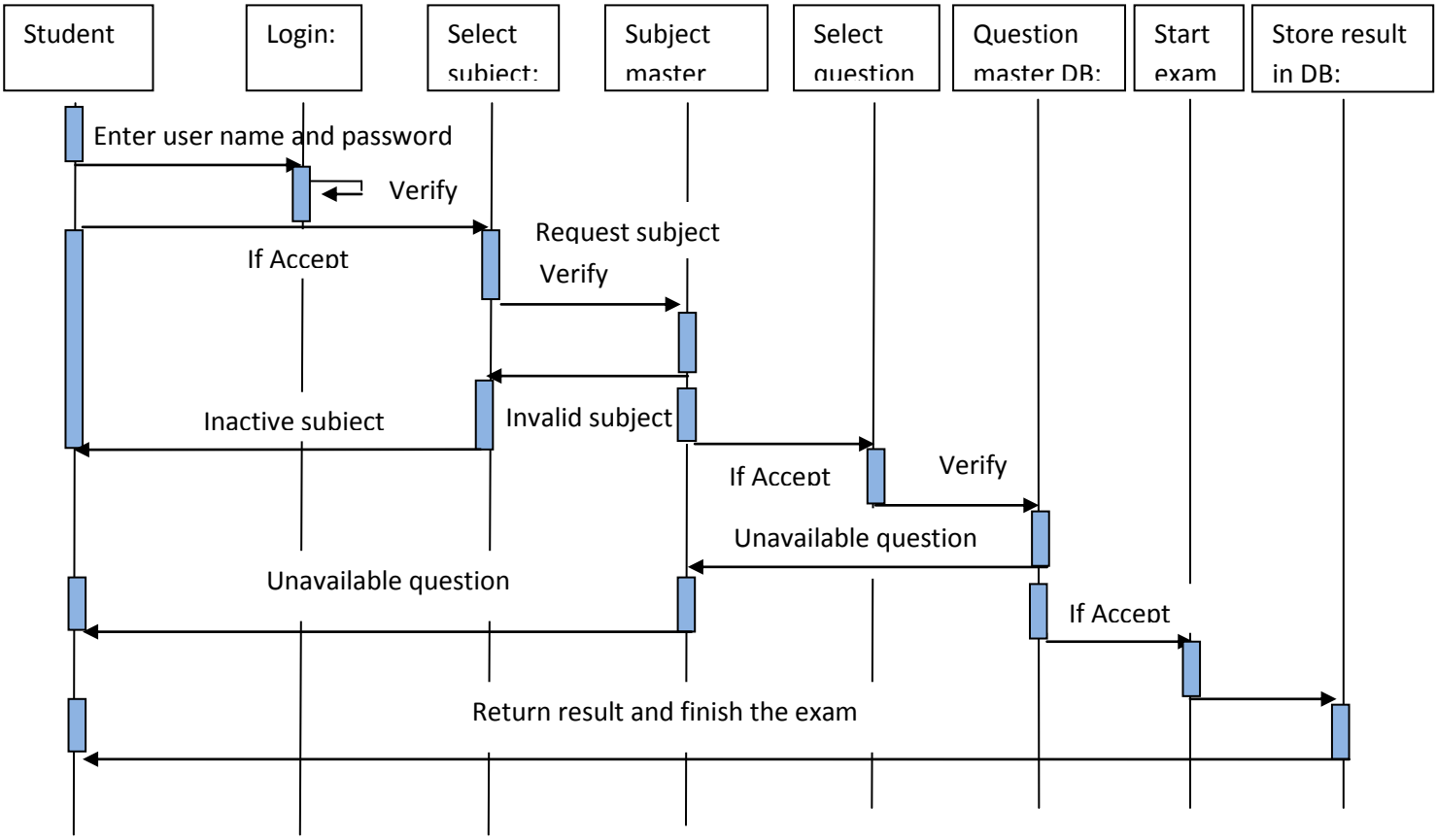



Figure (3.2): present how student take an exam and give the result.

The analysis of the working function of the design would be elaborated in subsequent chapter(chapter four)

# CHAPTER FOUR

## 4.0 SYSTEM DESIGN, TESTING, AND IMPLEMENTATION

## 4.1 SYSTEM DESIGN

The system is designed to have seven windows asp.net form .this forms tend to create the unique interaction between the student and system to support them into achieving their exam task. The form has been simplified to have various object representing certain identity that enable the student accomplish the exam and result produce in due time. The forms and object feature have been elaborated below.

## 4.2 SYSTEM IMPLEMENTATION

The system was designed using visual studio 008 platform. This platform is enriched with many programming language such as visual basic, c++,c#, asp.net.wpf and much more for windows programming. Having considered the enormous task ahead the html, vb, asp.net, sql and access was used in the development. Microsoft access as the database sql was used as query language to retrieve information from the database.

### WELCOME PAGE

The welcome page comprise of an introductory into the view of what is expect of the program .in this page active splash screen are seen and animation are displayed to give a interactive view of the program. During this process mostly flash player is used to drive the animation of the welcome page. The information provided by this welcome page includes

- The display of animation effect of the achieved program
- It provides a link to the next form

## VERIFICATION/LOGIN FORM

In the online entrance examination system the verification process helps recognize only registered student for the exam .in this form we have required information to be entered to accomplish this process such information include:

- serial pin of the scratch card
- users name
- password

This information is displayed on an object called label while the input object for this feature is the textbox.

When a student logs in after the welcome page he/she is expected to enter the users name and password and serial number of the scratch card he/she bought. When this information are entered into the required field the system connect to the database to verify this acclaimed person and ensure that he has registered duly for the exams if the verification process was successful the users would be taken to next form if not a message will be displayed user not recognized please enter your password and your serial pin again.

## DATA FORM

In the data form student who have successfully passed the verification form can view this form. This form provide information about the student registration such as

- name of student
- registration no
- department choice

- course offer
- passport etc

After student has finished viewing this form they can proceed to entrance examination by clicking on start the exam.

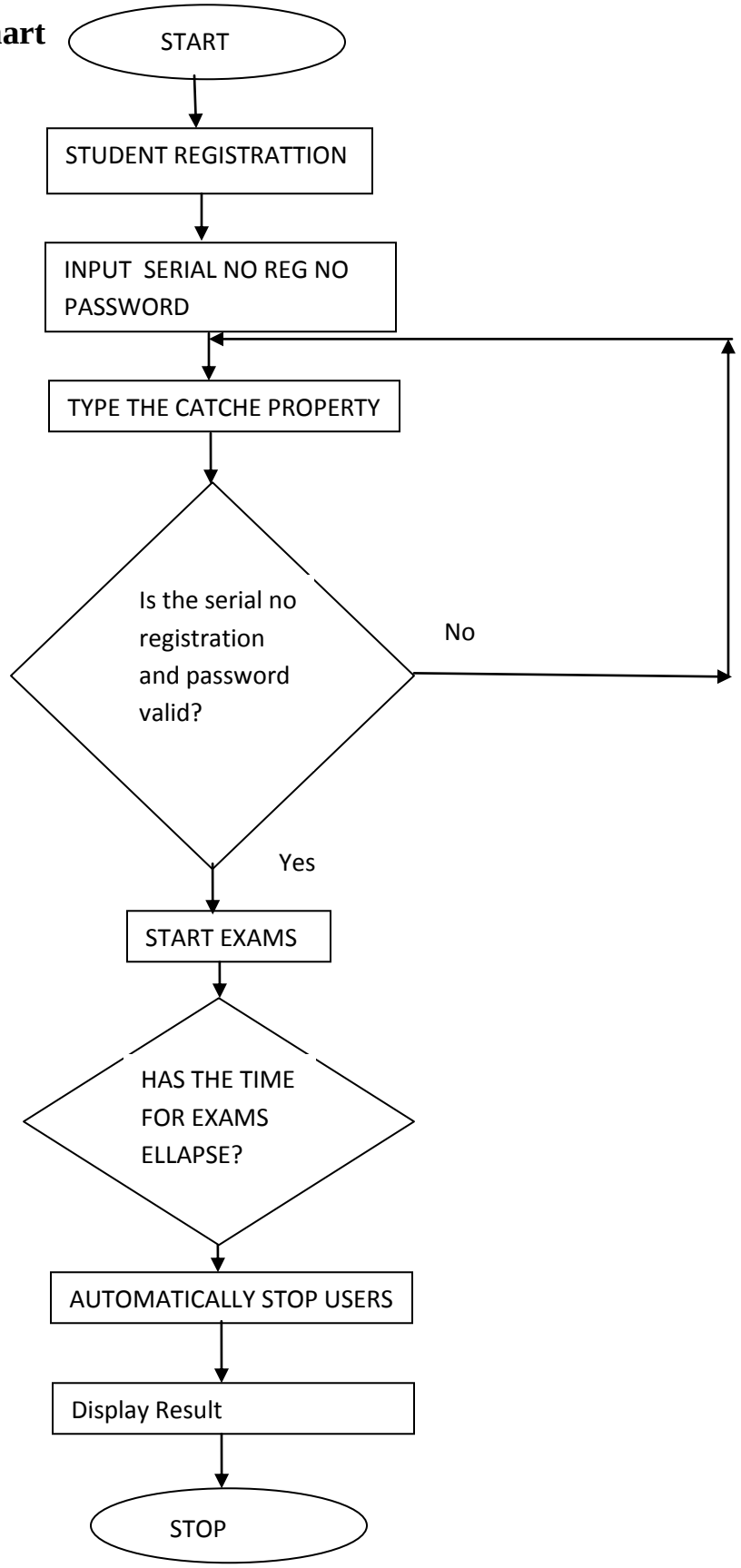
**EXAM FORM**

This is the main form of the system where student are tested through the computer process .in this form a series of random question are produce depending on the subject choosing and also options to that question are produce .student are expected to select just one and answer and click on summit if the answer is correct a message is displayed correct and two point is record for any correct answer. student have just I minute to each question , 25 question to answer making it a total of 25 minutes to each subject and a grand total of 1hr 40 minutes for the exam. Once the allocated time for the exams is reached student are automatically logged out .the only options left for now Is to view your result.

**RESULT FORM**

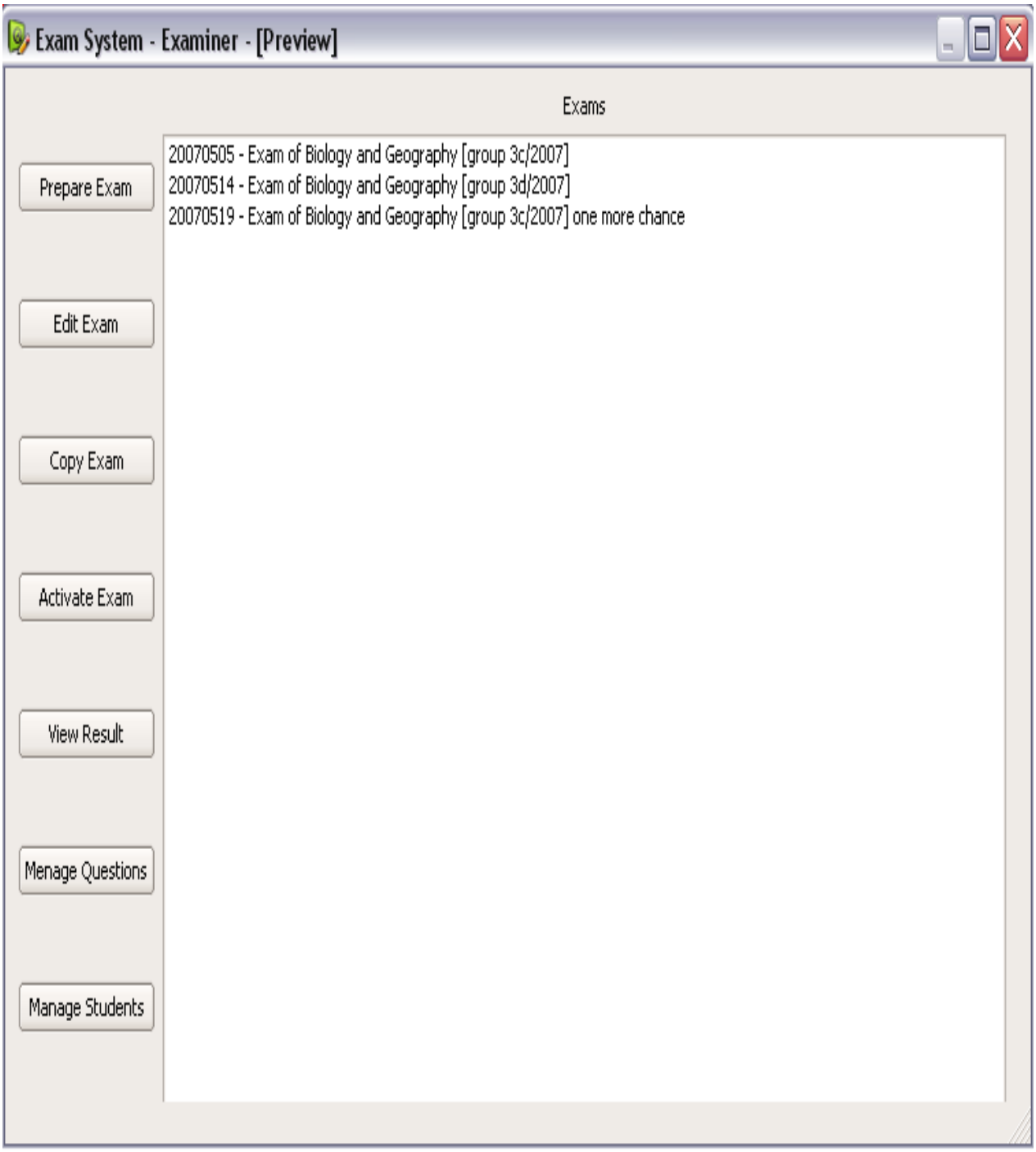
Once a student finishes his exams he can view the status of his result immediately by clicking on view result. in this view result form the name of student ,subject ,registration no, scores for each subject are shown and also if a student has been given admission and the course of study so all will be viewed immediately also user can also print his /her slip for the exam.

**System flow chart**

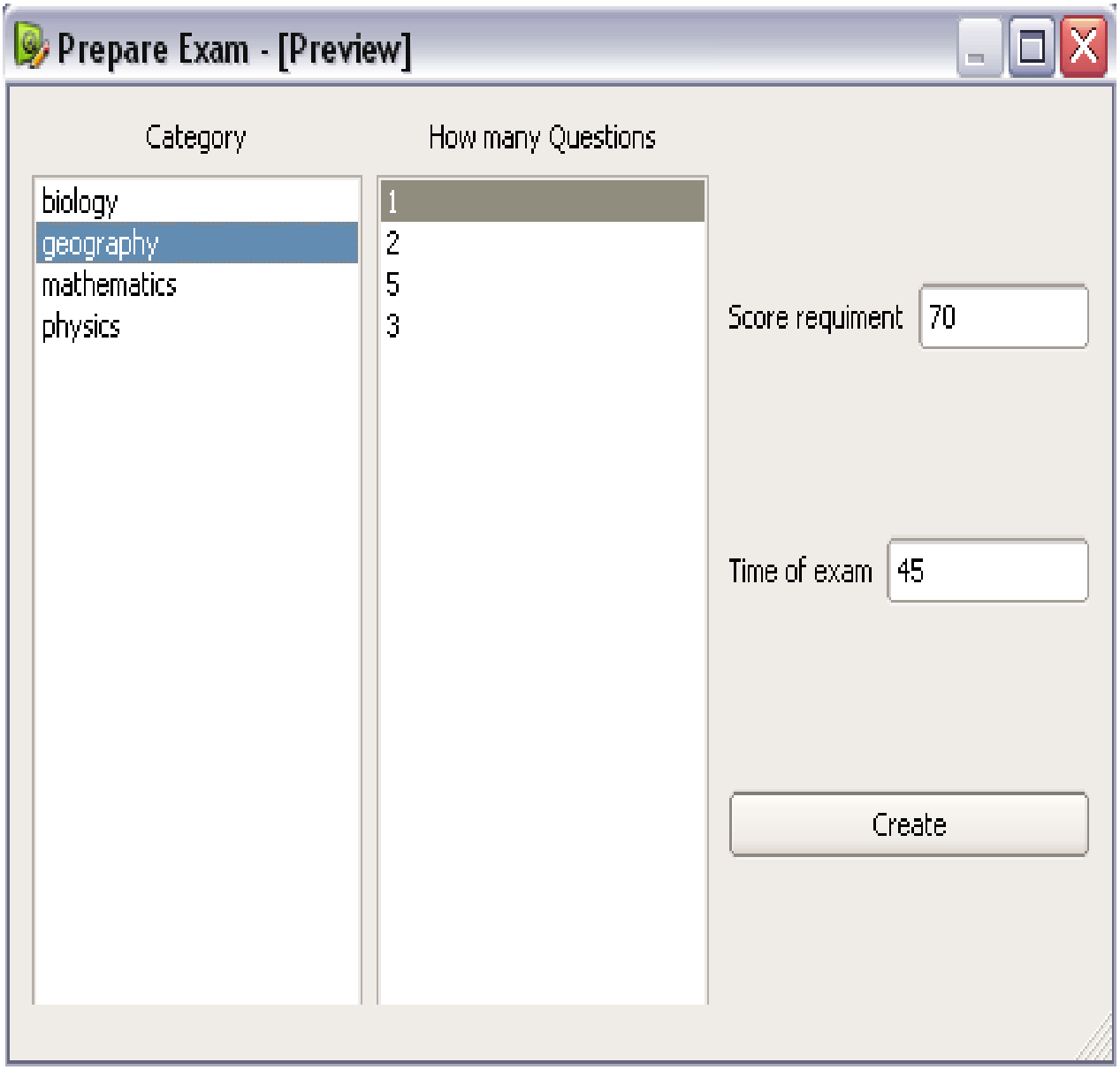


Windows preview of the likely interactive feature of the online entrance examination system

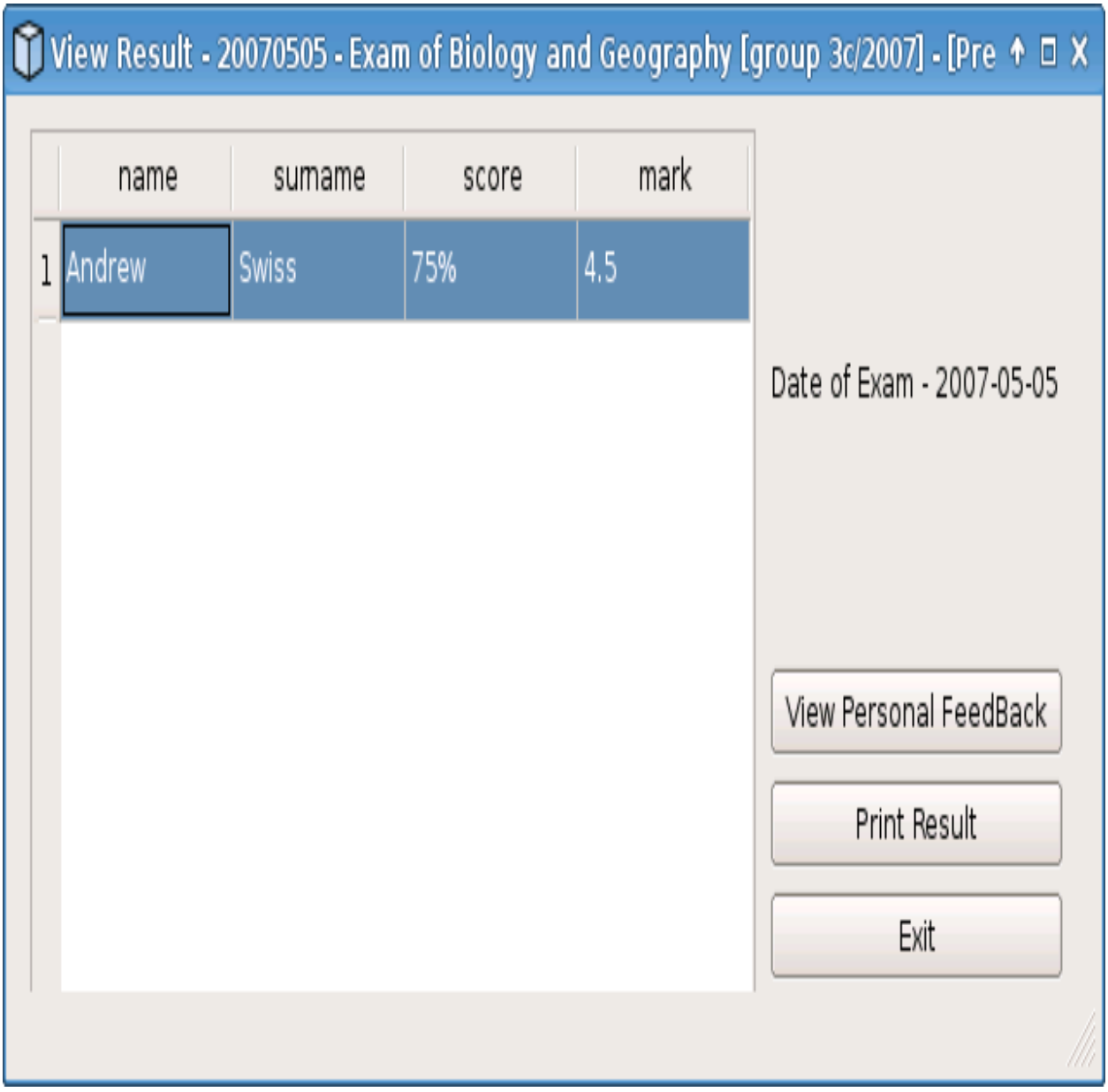
**Main Window**



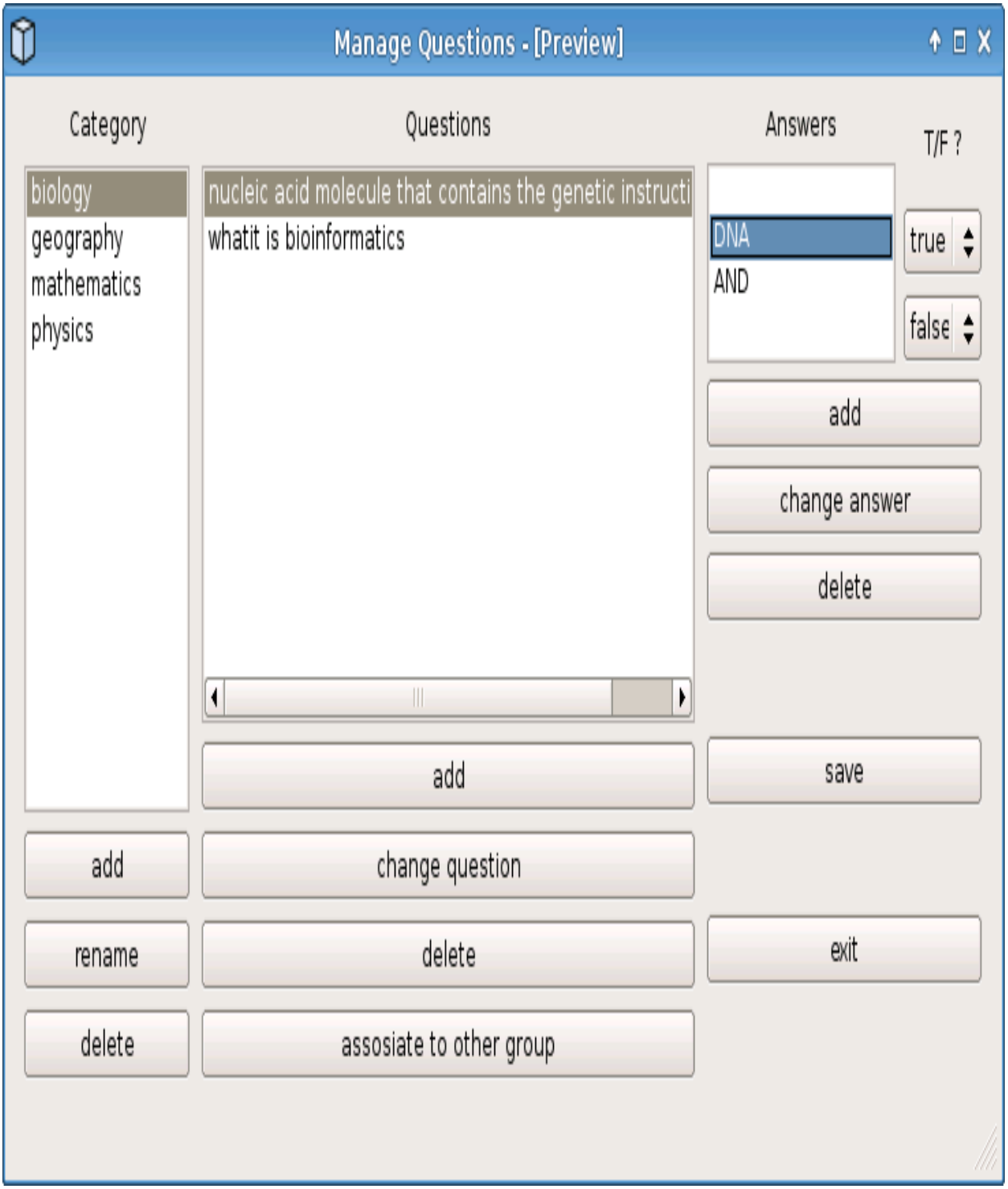
**Prepare exam**



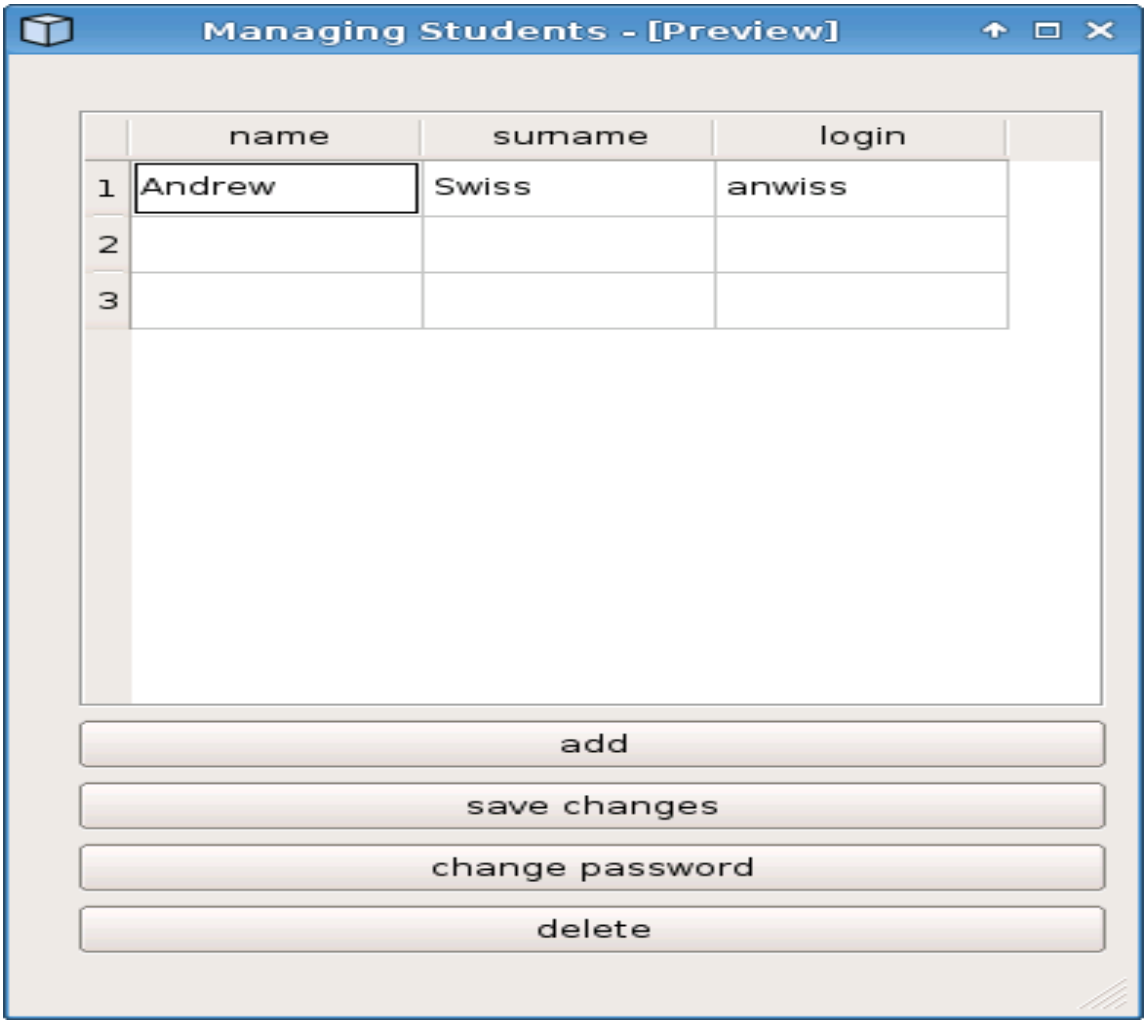
**View Result**


View Result - 20070505 - Exam of Biology and Geography [group 3c/2007] - [Pre
name
sumame
score
mark
1
Andrew
Swiss
75%
4.5
Date of Exam - 2007-05-05
View Personal FeedBack
Print Result
Exit

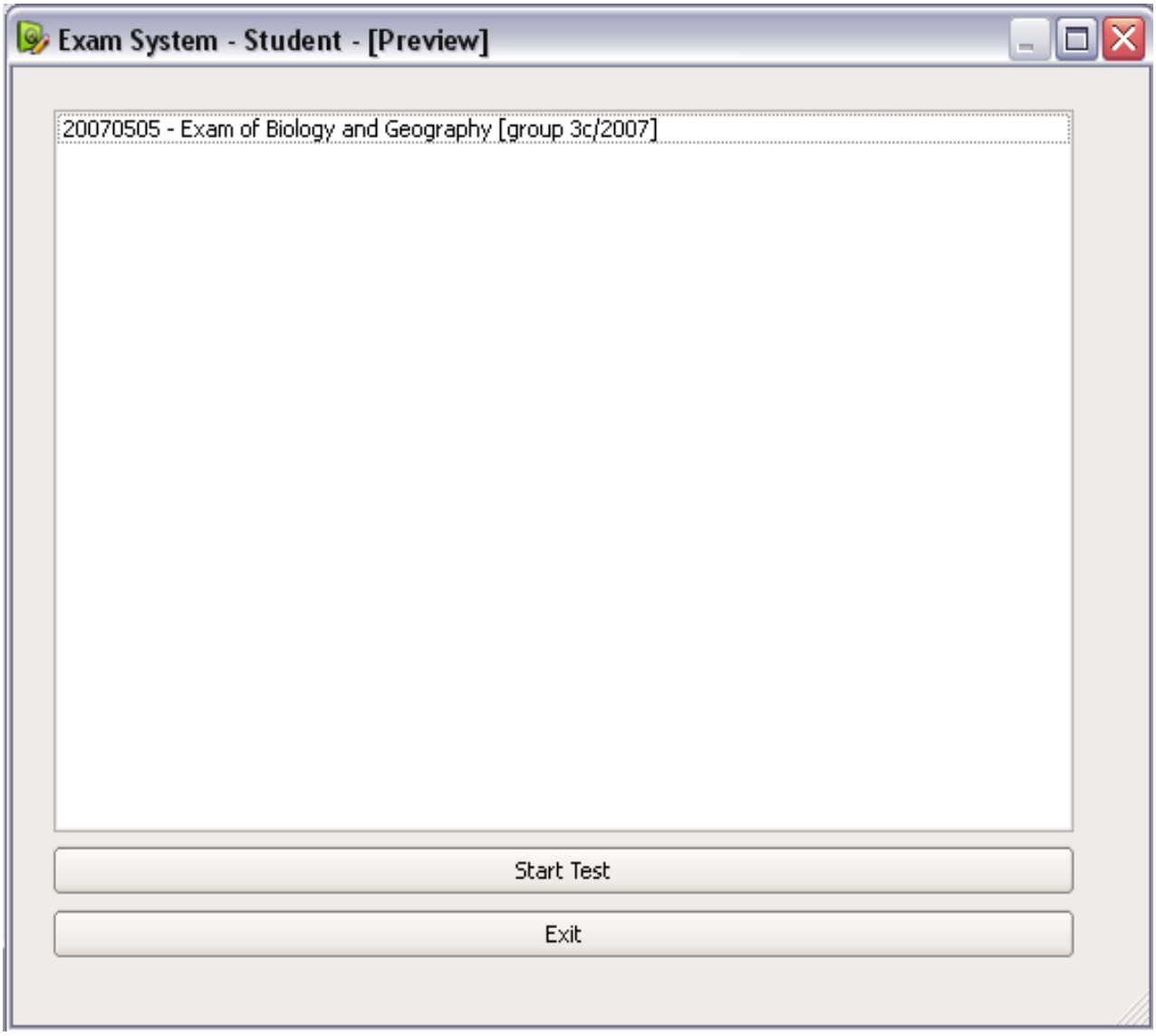
## Managing question



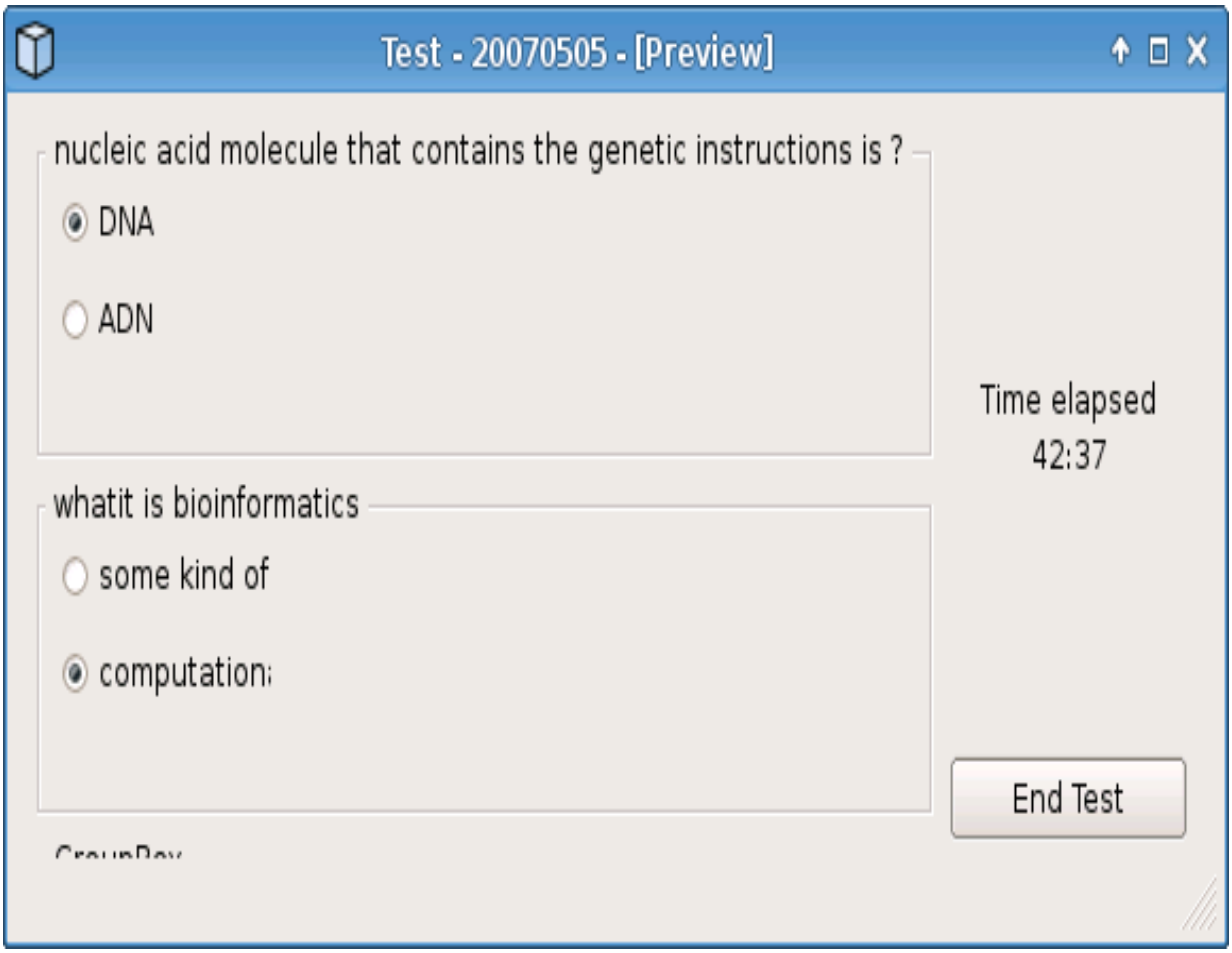
## Managing student




Main window




**Filling entrance examination**


Test - 20070505 - [Preview]
nucleic acid molecule that contains the genetic instructions is ?
DNA
ADN
Time elapsed
42:37
whatit is bioinformatics
some kind of
computation
End Test

(1) The system has simple fraud protection function; it employs random generation of the order of questions in each student's test making cheating extremely difficult.

(2) Besides textual test questions, the questions could also be in diagram form, animations and other multimedia forms, making the test questions more diverse.

(3) The time limit of a test is set by the teacher; hence students will not be able to login after the time is up.

(4) Teachers can set durations for a test; the clock begins when a student login to the test; when time is up, the system automatically submits the tests.

(5) A student cannot login again once the test has been submitted. In other words, the system prevents re-taking of tests.

(6) Teachers while still setting questions for a test may at any time add or delete questions. They can also edit previously set tests.

(7) Both teachers and students can check test results online through the simple interface.

(8) All test questions are open for sharing, and they can be edited at any time.

(9) A test can be generated automatically from the test bank by specifying the chapter and the number of questions in a test.

(10) Statistical analysis can aim at a particular test to determine the average score scored by students on a particular test, which is used by teachers as reference material to remedy teaching.

# CHAPTER FIVE

## 5.0 SUMMARY CONCLUSION AND RECOMMENDATION

## 5.1 SUMMARY

Online entrance examination system is way of improving educational activities fast and efficient over period of years student have had cause to bother about the way and marking of their entrance examination some normally have the thought of been mark down while some have the thought of their exam been marked negatively by the school exams and record as a result of this notion which student are considering a fast and reliable way that could help ensure that immediately they finish their exams their script is marked and result displayed this will help reduce their fear of how their script would be marked. This software is very interactive and users friendly has all the command controls that would allow student successfully accomplish the exams have been implemented using the simplest graphic styles. All users needs to do is to register by buyng a scratch card from the school of choice center after registration you are giving a secret password. You have to use your secret password and your serial pin of the scratch card purchase to login for the exams.

## 5.2 CONCLUSION

Having developed the online entrance examination though it is subjected to modification of feature as time goes on. This software through its interactive interface can minimize the educational workload of the educational sector, save cost no need for paper purchase, save human labor and time due to the auto timing of each exams. This is a very creative information technology system the system

can store the record if each student and it can also be recall when necessary reference is needed. As a result of the ability of the system student can write their exams within a remote location once connected to the web url.

## 5.3 RECOMMENDATIONS

Online entrance examination system considering I benefit to the society the following recommendation has been made

- University Education: The online entrance examination would be very useful in this sector considering the large number of student that apply for university entrance examination each year and invigilators inability to see the activity of the student. Using this in the university sector the labor and stress is reduced and also to avoid human error of misplacing student script.
- In polytechnics and colleges of education
- In professional examinational bodies like nabteb, ican,pmpi  e t c

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