Available online www.jsaer.com

***Journal of Scientific and Engineering Research*, 2023, 10(8):40-48**

Research Article

ISSN: 2394-2630
CODEN(USA): JSERBR

Android-based Search Engine Development for the Computer Science department at the Nigerian Institute of Leather and Science Technology

Daniel A[1]., Suleiman, I.A[2]

[1]Department of Computer Engineering, Faculty of Engineering, Edo State University Uzairue, Km7, Auchi-Abuja Road, Iyamho-Uzairue Edo State, Nigeria
[2]Department of Agricultural & Bioenvironmental Engineering, School of Engineering Technology, Auchi Polytechnic, Auchi, PMB 13, Auchi, Edo State.
Email: aliu.daniel@edouniversity.edu.ng

Abstract The increasing prevalence of handheld mobile devices has spurred significant research interest in harnessing mobile technologies to enhance learning activities. This project explores the potential of mobile technologies in simplifying exam management and performance assessment processes within educational settings. A prototype system, implemented on the Google Android OS, is presented as a case study to demonstrate the system's capabilities. This platform provides lecturers with the tools necessary to create and administer exams, while also enabling instant result generation upon exam completion by students. The system aims to improve the overall efficiency and effectiveness of exam management and assessment processes in educational environments. Critical aspects of developing this system include mobile device and platform-specific design considerations, lightweight and efficient implementation, interface usability for quick and convenient question navigation, and performance evaluation. By evaluating the prototype's performance and usability, this research seeks to contribute valuable insights into the design and implementation of mobile technology-based solutions for exam management and performance assessment in education.

Keywords Mobile technologies, exam management, performance assessment, educational settings, Android OS

1. Introduction

Examination, they say, is not an actual test of knowledge. In our contemporary society, this axiom holds only in theory but not in practice. An examination that is supposed to be conducted and evaluated confidently is now seen with students even before the date and time the Examination is scheduled. History has it that ancient China; was the first country in the world to implement a national standardized examination called the "imperial examination" (Sweaver, 2005). The primary purpose of this Examination was to select able candidates for specific governmental positions. The Imperial Examination was established by the Sui Dynasty in 605 AD and was later abolished by the Qing Dynasty 1300 years later in 1905. England adopted this examination system in 1806 to select specific candidates for positions in Her Majesty's Civil Service (Downing, 2000). This examination system was later applied to education. It started to influence other parts of the world as it became a superior standard (e.g. regulations to prevent the markers from knowing the identity of candidates) for delivering standardized tests. There are three methods of Examination: written examinations, oral examinations and physical fitness examinations (Jesse and Dan, 2002, Li, 2009, Min et al., 2017). In written examinations, we have multiple-choice questions. Multiple-choice questions have two subcategories. The first category is called True/False. This requires the student to choose all appropriate answers. True/False questions present candidates with a binary choice - a statement is true or false. This method presents problems, as depending on the number of questions, many candidates could get one hundred percent (100%) just by guesswork and should, on average,

get fifty percent (50%). The second category is called the Best-Answer question. This requires the student to only answer from a list of options (Sweaver, 2005).

According to Downing (2000), other forms of questions in written examinations include:

I. **Matching** - a matching item is an item that provides a defined term and requires a test taker to match identifying characteristics to the correct term.

II. **Fill-in-the-Blank** - a fill-in-the-blank item provides a student with identifying characteristics and requires the student to recall the correct term.

III. **Essay** - in the essay, an item is given to a student.
An essay typically requires a student to write a response to fulfil the requirements of the item. As an assessment tool, essay items can test complex learning objectives as well as processes used to answer the question. The items can also provide a more realistic and generalized task for Examination (George, 2005). In administrative terms, essay items take less time to construct.

IV. **Mathematical questions** - most mathematics or calculation questions from subjects such as chemistry, physics or economics employ a style that does not fall into any of the above categories. Instead, most mathematics questions state a question and require the candidate to solve it, usually with marks given more for the steps taken than for the correct answer.

V. **Oral Examination** – is a type of Examination where the student is tested based on his ability to face a panel and answer questions by speaking. Assessment is based on how much the student can comport his/herself.

VI. **Physical Fitness Examination** is a test designed to measure physical strength, agility, and endurance. They are commonly employed in educational institutions as part of the physical education curriculum, in medicine as part of diagnostic testing, and as eligibility requirements in fields that focus on physical ability, such as the military or police.
Manual Examination System is replete with several problems. A cursory glance at Manual Examination Administration System reveals cases of examination malpractice and other immoral acts committed by students. This violates the rules and regulations of Universities as it concerns the administration of Examinations and the human moral content. This has taken a tool from the Nation, as it produces half-baked graduates who cannot compete with University graduates from other world nations (George, 2005). The need to protect the Nigerian Nation's image and the University System is very pertinent.

In addition, errors may arise during the manual computation of results due to commission. There are also cases of missing examination scripts during marking. There is also a problem of time wasting, among others (Weaver, 2005, Xin et al., 2016).

This research suggests that if an efficient and effective online examination system is developed, where examinations will be taken online, and results computed and released immediately, as well as stored in a central database for documentation and future planning and evaluation purposes, there shall be relative balance and harmony within the University System. The staff will take advantage of the time that would have been spent on marking the Examination and preparing results to enable them to do their research work. This will also cause unserious students to be committed to their studies (Jay and Stephen, 2008).

The Nigerian Institute of Leather and Science Technology is one of the leading tertiary institutions in Nigeria. Every year, many candidates apply to the institution. The Examination is conducted manually, i.e. a paper base system for the entrance and school examinations. Due to this manual examination process, every semester's result is always delayed towards the subsequent semester examination. This manual process of conducting examinations has led to some problems in NILEST, including result delays. The online examination system will be of benefit to students and NILEST. This system will reduce the cost of conducting an Examination in NILEST. With this system, NILEST will experience free and fair Examinations. Students can access their results on time. The system will help students to maximize their potential since they know that the Examination is computer-based and there will be no cheating. This online examination system is a web-based application limited to the NILEST examination system. This system will have the ability to Response to candidate requests if necessary. An online Examination system will reduce the hectic job of assessing the answers given by the

candidates. The study aims to design and implement an android-based online examination system for the Computer Department of NILEST.

2. Methodology

A system analysis is a system of methods and principles for doing something, such as teaching or carrying out research (Jay and Stephen, 2008). The methodology is the general research strategy that outlines how research is to be undertaken, and among other things, it identifies the methods to be used in it. These methods, described in the methodology, define the means or modes of data collection or, sometimes, how a specific result is to be calculated. The methodology does not define specific methods, even though much attention is given to the nature and kinds of processes to be followed in a particular procedure or to attain an objective.

2.1 System Study

System study involves thoroughly researching a specific system. Currently, the Computer Department conducts exams on paper, where students answer five out of seven questions provided by their lecturers. Afterwards, the lecturer collects and grades each script individually.

2.2 Analysis of the Existing System

Various methods were used to gather information about the system. Presently the Nigeria Institute of Leather and Science Technology Examination has to do with the manual process of Examination which means student writes on paper andlecturers marks it before calculating each student score then submitting the booklets to the examofficers.This takes a lot of time and makes it easy for errors to occur.

2.3 Problems of the Existing System

Exams are conducted manually, which has to do with paper and pen, which opens room to exam malpractice and lecturers favouring some students when marking the exam scripts. It takes a lot of time for the hand to be marked and for the results to be compiled.

2.4 The Solution to the Problem

This project will solve the problems mentioned above by designing an Android-based application using a Java programming language that will enable students to write their exams online with the help of their smartphones. This will be very covenant for the user because they are familiar with the use of their smartphone, which makes it even more user-friendly to the users.

3. System Feasibility Study

Feasibility Study of a system is the study of the viability of that system; a study on search Engine android app was carried out by me in the aspects of the hardware requirement such as the processor, random access memory (RAM), the software requirement such as the operating system, a programming language which is Java Programming language for program design, the financial cost of the program and the duration of time I have to carry out this project, and I got to understand that the project is feasible (Jesse and Dan, 2002, Li, 2009, Min et al., 2017).

3.1 New System Design

This App is designed to ensure that Students write their exams using their smartphones in the most user-friendly way possible. The new system will allow lecturers to upload their exam questions and provide answers to the questions because results will be processed once the student submits their answers**.**

3.2 System Architecture

This deals with the conceptual models that define the structural components and inter-relationship among the system element. It denotes the high-level structure of software which comprises the software elements (entities), the relationship between them, and in some cases, the attributes of both entities and relationships.

This system architecture goes from the smartphone to the internet, then with the internet's help, it requests access to the institution server, logs in, and writes the Exams and the score displayed to him on the smartphone.

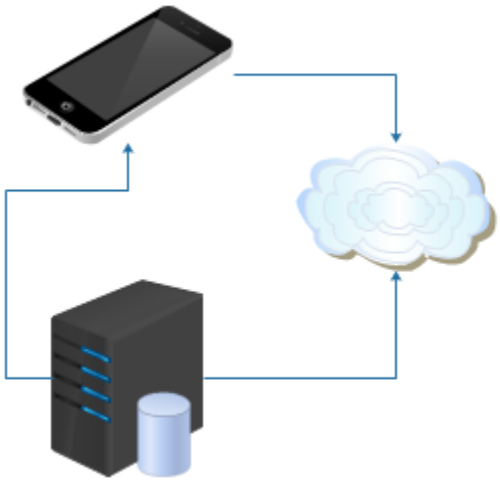

Figure 1: System Architecture

3.3 System Flowchart

System flowcharts display how data flows in a system and how decisions are made to control events. To illustrate this, symbols are used. They are connected to show what happens to data and where it goes.

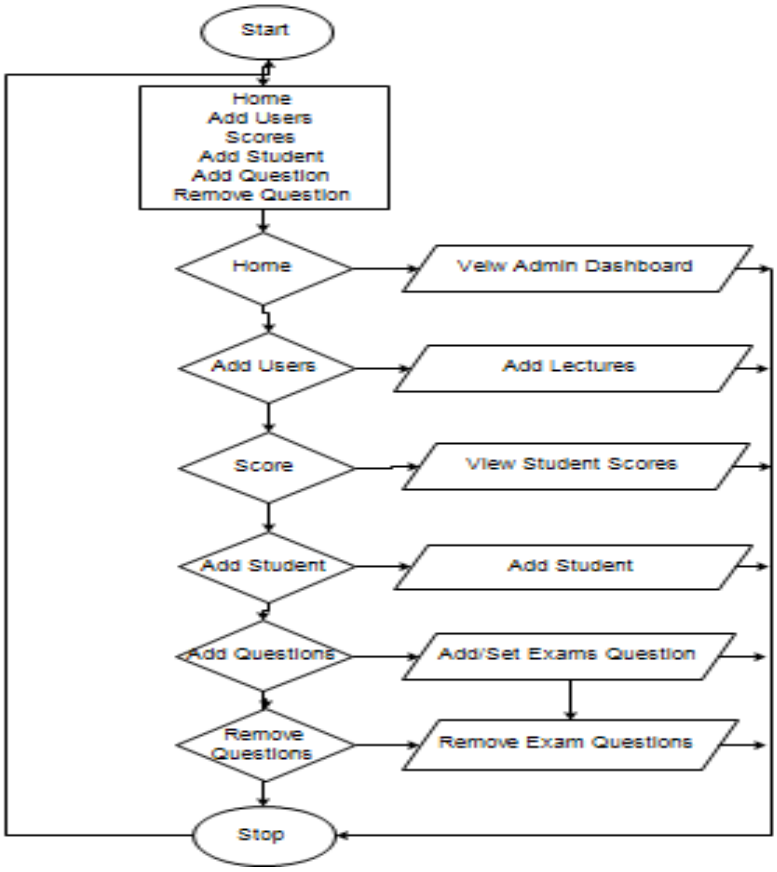

Figure 2: Admin Flowchart

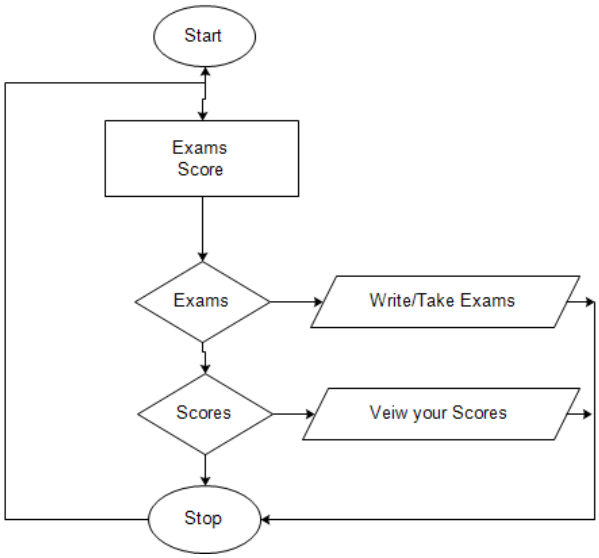

Figure 3: Student Flowchart

3.4 System Implementation

3.4.1 System Development

System development is a conceptual model used in project management that describes the stages of an information system development project (Stephen, 2008, Tallent-Runnels, 2006, Tate, 2002). System development is composed of a number of Cleary defined and distinct work phases which System Engineers and System developers use to plan for, design, build, and test and deliver information system. System development aims to produce a high-quality system that meets or exceeds customer expectations based on customer requirements by providing a system that moves through each clearly defined phase within scheduled time frames and cost estimates. This app was developed to allow a student to write Exams with the use of their smartphone conveniently; not only is it easy, but it also marks and displays the result immediately after they are done.

3.4.2 System Implementation

System implementation is the carrying out, execution or practice of a plan, a method, or a design for doing something. Implementation is an action that must follow any preliminary thinking for something to happen. In an Information Technology context, implementation encompasses all the processes involved in getting new software or hardware to operate correctly in its environment, including installation, configuration, running, testing and making necessary changes (Tallent-Runnels, 2006, Tate, 2002).

Interface Forms

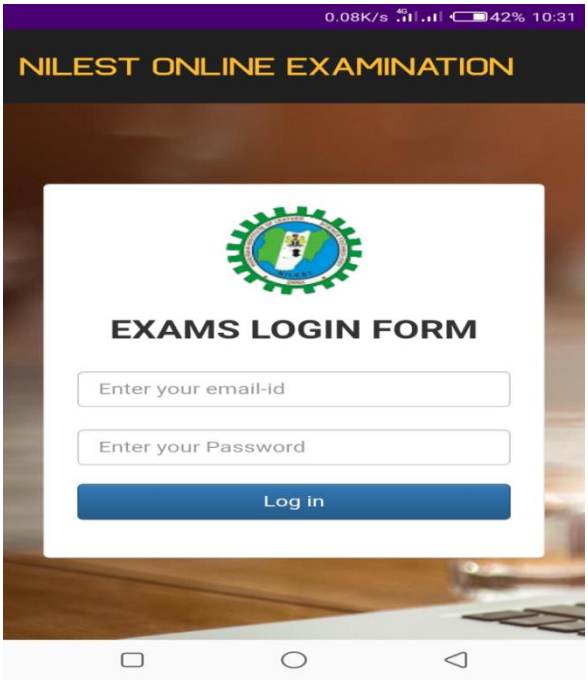

Figure 4: Application Homepage

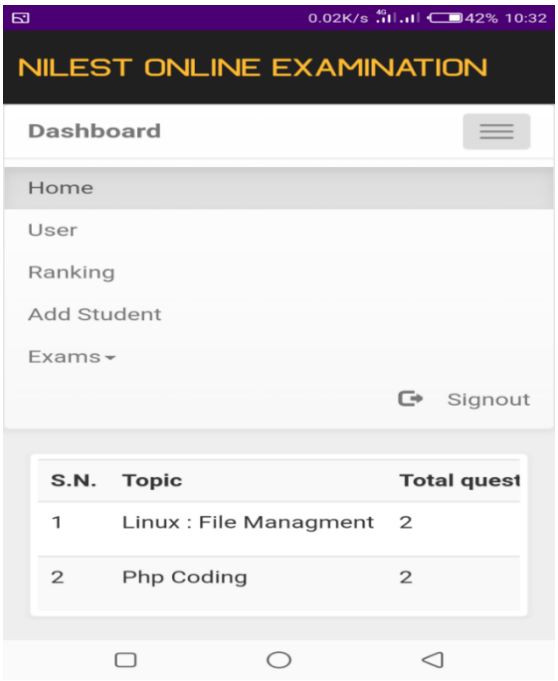

Figure 5: Admin Dashboard

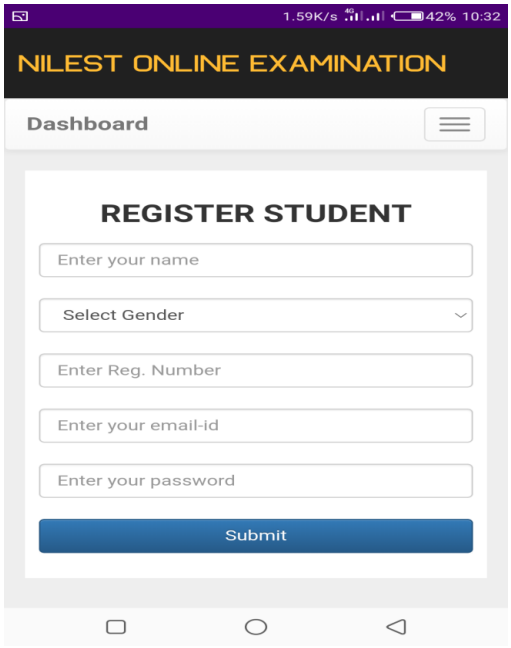

Figure 6: Add Student

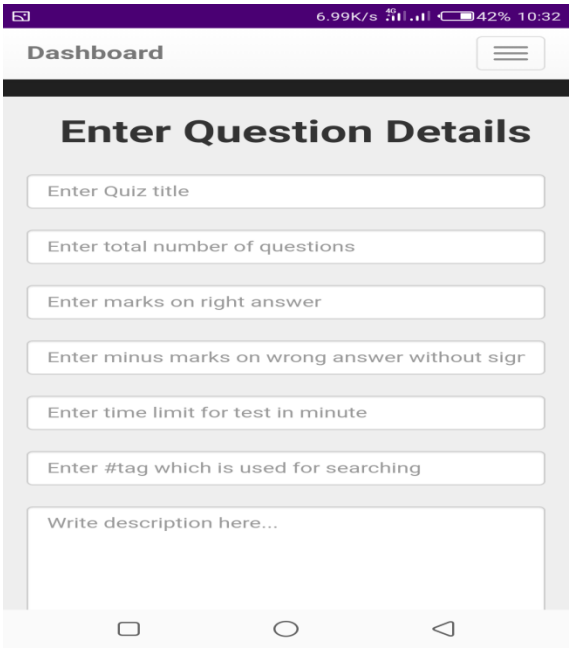

Figure 7: Add Exams Question

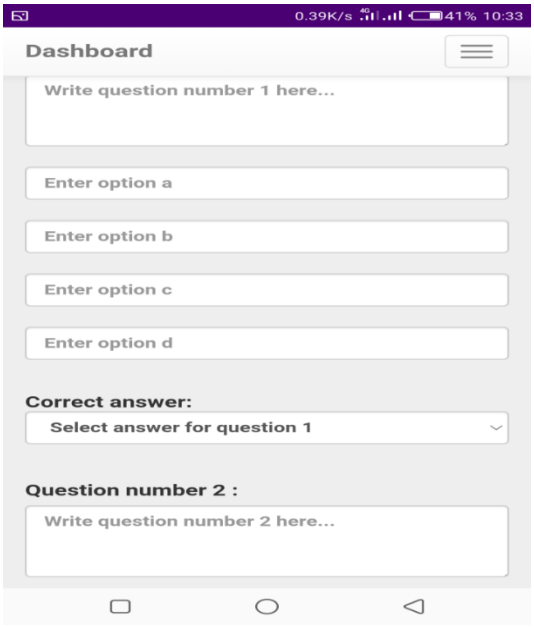

Figure 8: Input Questions and answers

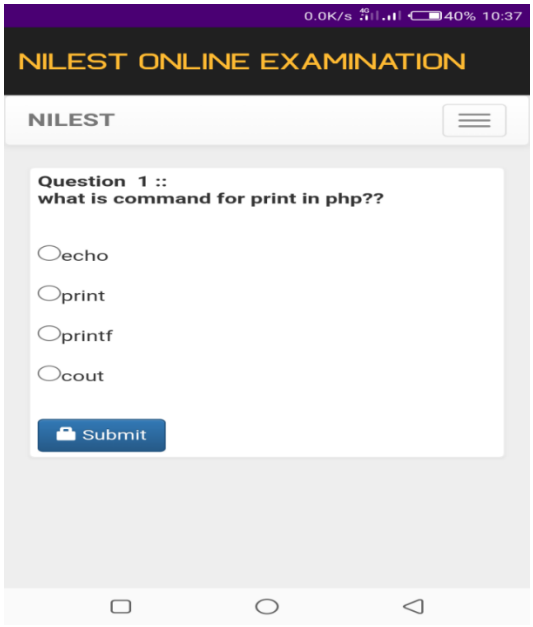

Figure 9: Student Taking Exams

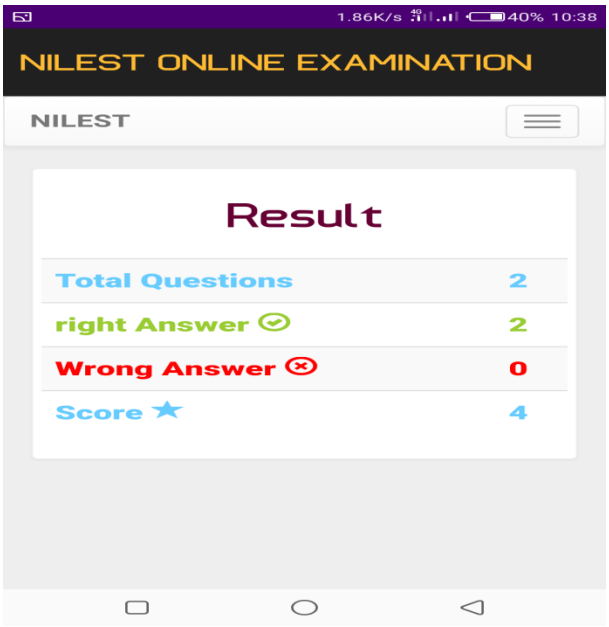

Figure 10: Scores

4. DOCUMENTATION

There is little or no need to produce a system if it cannot be understood and used except by its implementers. The documentation describes how the program works in its construction and clarifies any obscurities in the program.

4.1 Program Documentation

The programming language used in writing this software is Java, and it was made to run on Androids (Smart Phones). The following conditions must therefore be met to have a hitch-free use of the program:

Operating system: Android version 4.3 and above

Memory: The minimum memory requirement is 500 megabytes

Hard drive: 2 gigabytes and above

4.2 System Requirements

System requirements or software are a list of what software programs or hardware devices are required to operate the program. These are the necessary specifications your computer must have to use the software or hardware.

4.3 Hardware Requirements

Hardware is the computer equipment and devices involved in a computer system's function together with the software components. Hardware is the physical components of the computer system assembled to interact with the software to form a hybrid system.

The minimum hardware requirements are:

i. Android Version 4.4 Jelly Bean processor
ii. 500MB available disks space
iii. RAM (500MB)
iv. Internet Access

4.4 Software Requirements

Software is a set of program modules needed to control and coordinate the activities of the hardware device of the computer system.

The software requirements are:

i. Android OS
ii. ECLIPSE IDE
iii. Java Development Kit version 9 and above

5. Conclusion

This research focused on developing an online Mobile-Based Examination System for the Nigerian Institute of Leather and Science Technology (NILEST). In light of the rapid advancements in technology, it is imperative that educational institutions adapt to emerging trends, fostering higher and faster critical thinking among students. The development of the mobile-based examination system represents a significant step towards streamlining exam management and performance assessment processes within NILEST. Through diligent efforts, the project has achieved a high level of completeness, successfully demonstrating the benefits of integrating mobile technologies into the educational environment. While the current prototype has shown promise, there is always room for improvement and further development. Researchers and practitioners are encouraged to build upon this foundation, enhancing the system's capabilities and expanding its applicability to a broader range of educational contexts. By continually refining and optimizing the mobile-based examination system, it is possible to contribute to the ongoing evolution of efficient and effective assessment methods in education.

References

[1]. Sweaver D Evaluation: WebCT and the student experience. Evaluations and Assessment Conference Posted: 2005
[2]. Downing, D., et al. (2000). Dictionary of computer and Internet terms, Barron's Educational series.
[3]. George Shepherd., 2005. Microsoft ASP.NET 2005: Step By Step. 5th Ed. Ben Ryan and Kathleen Atkins (Eds.). Redmond Washington: Microsoft Press.
[4]. Jay Hilyard and Stephen Teilhet., 2008.C# 3.0 Cookbook: More than 250 Solutions for C# 3.0 Programming. (3rd Ed.) United States of America: O'Reilly and Associates.
[5]. Jesse Liberty and Dan Hurwitz., 2002.Programming ASP.NET. Ron Petrusha and Valerie Quercia (Eds.) United States of America: O'Reilly and Associates

[6]. Li Yueru Algorithmic Online Examination System Design FuJian computer, volume 1, p. 66 - 67 Posted: 2009

[7]. Min Tan, Qiang Fan, Yu Tong. Research and design of online examination system, [J].information channel, 2017

[8]. Stephen Walther., 2008. ASP.NET 3.5 Unleashed. United States of America: SamsPublishing William B. Sanders., 2009. ASP.NET 3.5: A Beginner's Guide United States of America: McGraw-Hills.

[9]. Tallent-Runnels, M. K., et al. (2006). "Teaching courses online: A review of the research." Review of educational research 76(1): 93- 135.

[10]. Tate, L. (2002). "Using the interactive whiteboard to increase student retention, attention, participation, interest, and success in a required general education college course." Retrieved January 30: 2007.

[11]. Weaver, D., et al. (2005). Evaluation: WebCT and the student experience. Evaluations and Assessment Conference.

[12]. Xin Cao, Hong He, Yana Zhang, Li Han. Discussion on the design and implementation of online examination system in colleges and universities. Knowledge and encouragement, 2016