

AN INTERACTIVE PARTICIPATORY SOLUTION TO DISTANCE LEARNING

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by

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of

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DECLARATION

I hereby declare that this thesis is based on the results found by myself. Materials of work found by other researcher are mentioned by reference. This thesis, neither in whole nor in part, has been previously submitted for any degree.

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ABSTRACT

Distance Learning (DL) has been established in Bangladesh using various methods. These are: (1) Printed Documents, (2) Audio Cassettes, (3) Video Tapes, (4) Radio Programs, (5) Television Programs and (6) Newspapers. However, all these methods have drawbacks e.g. Pre-recorded Telecast, no interactivity, no feedback, no monitoring of how many people attending, no monitoring of the quality of lecture, etc. It has been attempted to solve these problem with expensive technologies like Video Conferencing, Networking, and On-line solutions such as email and chat, etc. however, these are not Technologically Acceptable Models (TAM) for Bangladesh currently. In this paper we propose a solution to the DL problem using National TV and mobile technology. We have tested this method to be found it to be acceptable.

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CHAPTER I

INTRODUCTION

1.1. Back Ground

Information communication technologies have significantly changed the format of Distance Learning (DL). A distinction is traditionally made between education studies and distance education studies. Such distinctions have been taken for granted largely because educational studies were based on co-present teaching with face-to-face interaction between participants. Alternatively, distance education studies generally treated **access** to educational materials itself as an unsurpassed feature of such classes. In other words, the constraints of time and space have determined the boundaries of approaches to the study of distance learning, i.e. issues of access.

Traditionally from correspondence courses which rely mostly on mails and almost no participant-instructor interaction to the real-time delivery of information with the capability of having both participant-participant and participant-instructor interactions. Based on different needs from the participants and the limitations on their resources, the Technology based distance learning courses can generally be categorized, but not limited to, the following categories: Internet-based courses, Tele-courses, and videoconference courses.

In the Internet-based courses, all teaching and learning takes place through the Internet. Participants interact with the instructor and classmates through a course management website or using regular e-mail. This approach is considered asynchronous learning.

Bourne, McMaster, Rieger and Campbell (1997) have described how to effectively employ this type of learning for on-line courses. The learning can occur at any time and any place. The Tele-courses are video-based courses

delivered through videocassette tapes and video broadcasting. When using video broadcasting, learning takes place at a scheduled time. It is called synchronous method. However, there is limited or no interaction between participants and instructor during lecture for both approaches.

However, current infrastructure in Bangladesh does not support these technologies. That's why we have to find another technology to improve the quality of delivery in our education sector. So we offer a conceptual model, a research strategy and a survey instrument to assess students' perceived satisfaction with Interactive distance learning through Television Media with SMS Mobile Phone Technology.

We will start with some definitions, history, theories, and systems of DL in Bangladesh. Next, we will deal with our new methods and strategies for designing and delivering instruction at a distance. Finally, we will address management and policy decisions.

1.2. Current Educational Infrastructure of Bangladesh

Education in Bangladesh has three major stages: Primary, Secondary and Higher education. Primary education is a 5-year cycle while secondary education is a 7 year one with three sub-stages: 3 years of junior secondary, 2 years of secondary and 2 years of higher secondary. The entry age for primary is 6 years. The junior secondary, secondary and higher secondary stages are designed for age groups 1-13, 14-15 and 16-17 years. Higher secondary is followed by baccalaureate level education in general, technical, technology and medical streams requiring 5-6 years to obtain a Master's degree.

In the general education stream, higher secondary is followed by college/university level education through the Pass/Honors Bachelor Degree courses (3/4 years). The Master's Degree is of one year's duration for holders of Bachelor Degree (Honors) and two years duration for holders of (Pass) Bachelor Degree. Higher education in the technical area also starts after higher secondary level. Engineering, agriculture, business, medical and Information & Communication are the major technical and technological education areas. In each of the courses of study, except for medical

education, students are required to complete a 4-year course work while for medical education, a 5-year course of study is required for the first degree [1].

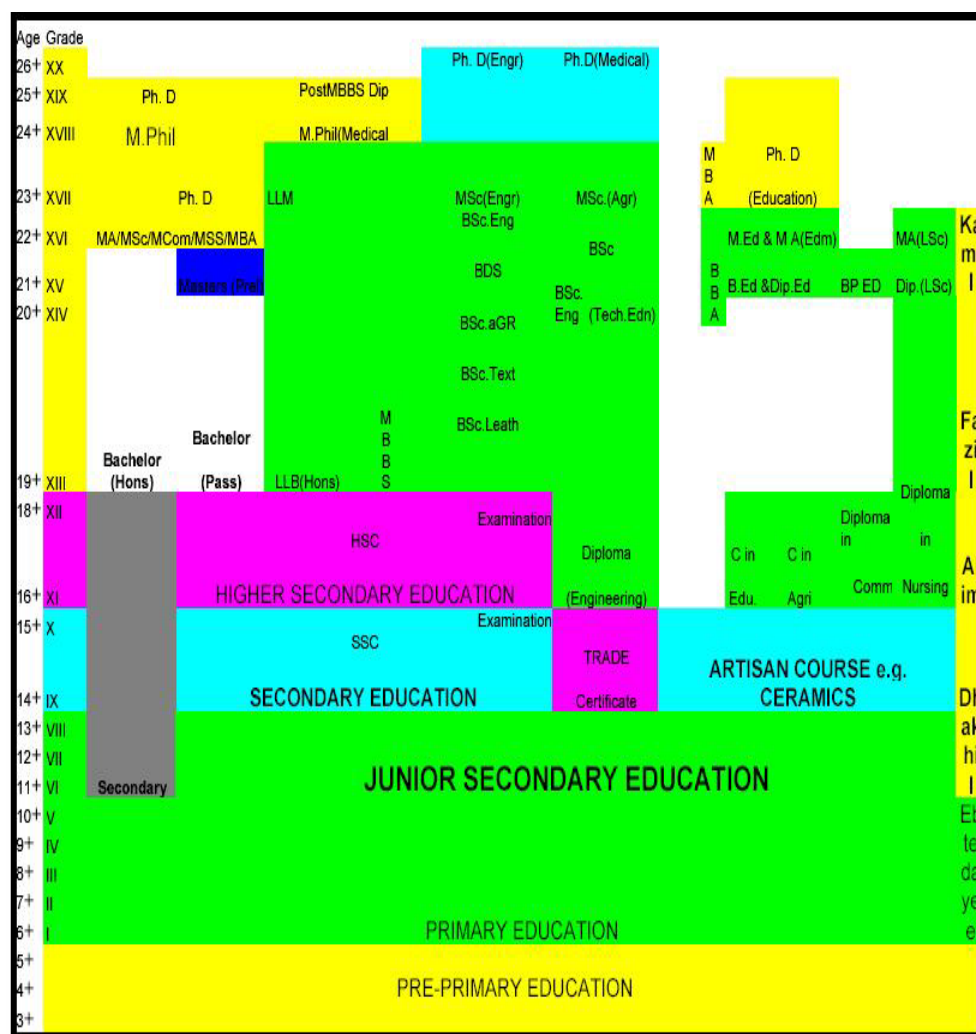


Figure1.2: Present Educational Structure of Bangladesh, Source Bangladesh Bureau of Educational Information and Statistics (BAIBEIS).

1.3. Primary Education

There are 3 main types of primary level institutions in the country. These are (i) Government primary schools (owned, funded and managed by the government) (ii) partially publicly funded non-government primary schools and (iii) wholly privately funded primary schools. This 3rd category encompasses the following types:

(a) Non-government no-registered (not registered with Ministry of Primary and Mass Education but is under the process of registration; managed by the School Management Committee (b) ebtedayee Madrasha (primary level non-government institutions imparting religious education) (c) ebtedayee madrasha attached to dakhil madrasha (dakhil madrasahs are non govt. educational institutions imparting madrasha education at the secondary level having a curriculum different from that taught in the mainstream) (d) secondary school attached primary sections (e) NGO schools (e.g BRAC schools , Gana Sahjya Sangstha schools) (f) Satellite school (schools containing only grade 1 and 3. these schools are go to the primary schools are established in villages where there is no primary school. Pupils studying in these schools go to the primary schools of the nearest village after completing grade 2. These are non-government schools) (g) Community school (on-teacher school run and funded by the community) (h) kindergartens (English Medium schools completely privately owned and managed (i) experimental schools (schools attached to the Primary Teacher Training Institutes where the trainee teachers go for practice teaching. The total number institutions, teachers and pupils in the primary education sub-sector are presented in the table below:

Table 1.3
Numbers of primary schools, teachers and pupils, 2002

Types of Schools	Number of Schools	Number of Teachers	Number of Pupils
Government	37671	157236	10669819
Non-government Primary School and other primary level institutions	40692	157819	6892009
Total	78363	315055	17561828

Source: Pocket Book on Educational Statistics (BANBEIS, 2003)

From above data we found that there is one teacher for 68 students in Government primary schools. Again there is only one teacher for 44 students in the Non-government Primary School and other level institutions [1].

1.4. Secondary Education

Post-primary education in the general stream is imparted by junior secondary schools (grades 6-8), senior secondary schools (grades 6-10) and higher secondary schools, known as Intermediate colleges (grades 11-12). Many higher secondary schools also offer courses leading to Baccalaureate degrees in liberal arts and sciences. Institutions containing grades 1-12 (primary to higher secondary) are few in number. Post primary level madrashas are known as Dakhil madrasha (grades 6-10), Alim madrashas (grades 11-12).

At the secondary level there is a separate stream of imparting technical-vocational education and training. After completing the junior secondary level, students may enter into Vocational Training Institutes for 2-year SSC (vocational) courses and after having SSC Vocational/SSC (science) they may enter into Vocational Training Institutes (VTI), Polytechnic Institutes for 2-year HSC (Vocational)/ 3-year Dip-in-Engineering courses. The number of secondary level educational institutions, teachers and pupils are presented in the table below:

Table 1.4

Number of education institutions, teachers and student by education stream
(Post primary)

Types of Schools	Number of Institutions	Number of Teachers	Enrollment
Secondary (general)	16562	186949	8162134
Madrasha	5536	70247	2168441
Technical/Vocational	1562	8623	134016
Total	23660	265819	10864591

Source: Pocket Book on Educational Statistics (BANBEIS, 2003)

From above data we got that there is one teacher for 44 students in Secondary (general) education institutions. The ratio for the teacher and students in Madrasha is 1:31. Again in the Technical/Vocational there is one teacher for 16 students [1].

1.5. Tertiary Education

Tertiary education, meant and designed for the post higher secondary (18-23 age group) students comprise a 3-year Pass course or a 4-year honors course (in the general stream) for Baccalaureate Degree followed by a 2-year and 1-year Master's course for pass graduates and honors graduates, respectively. Except for studies in the field of medicine, which requires the completion of a 5-year course of study for graduation, Baccalaureate degrees in the fields of engineering, agriculture, and textile and leather technology require the completion of 4-year courses of studies. Types and number of Tertiary educational institutions:

- 21 public and 54 private Universities,
- 2600 degree colleges (pass, honors and masters) affiliated with the National University,
- 5 regional Engineering Universities,
- 12 government and 14 private medical colleges, and by the
- Bangladesh Open University through its distance learning programs.

The teacher-student ratio at public universities was 1:84 in 2003 against a University Grants Commission standard of There were 10,47,035 students in 19 public universities in 2003. The number was 10, 75,866, with the students of the National University and the Bangladesh Open University (Newagebd, Saturday, January 15, 2005). But the standard ratio is 1:15 for general universities and 1:12 for technical universities.

1.6. Educational Problem in Bangladesh

Bangladesh is a populous (140 million, 2004) small country (1, 47,570 sq km) in South East Asia. Since its independence Bangladesh is suffering from high poverty (42% people are below national poverty line, 1995/96), highly illiteracy rate (male 49%, female 71% among people with age 15 above, 1998), insufficient on-campus educational facilities for the people in general, etc. From the upper discussion we identified the following issues, which are barriers to development in our education sector [1].

1.6.1. Literacy

A large number of peoples of Bangladesh do not get the light of education. More than 75 % peoples are uneducated. So it is one of the major issues for the development of our country. This estimate is based on the definition of literacy, which is defined as the ability to sign one's own name in one's own handwriting. This percentage would drastically change if the definition were changed.

1.6.2. Geographical Location

Geographically Bangladesh is a river delta. Its geographical location is divided into 6 divisions. These 6 divisions also divided into 64 districts. All divisions and districts are not equally developed. So the people of geographically the non-developed area are behind from the all types of development as education, technology, communication and so on.

1.6.3. Poverty

Poverty is definitely among the world's largest, most urgent, and most fundamental issues. The concept of poverty refers to an individual's, or families, inability to achieve minimal standards in fulfilling basic human needs such as food, clothing, shelter, health, education, and sanitation services. Its occurrence, as exposed by the extent to which elementary minimum needs are not satisfied, is undeniable. Bangladesh is one of the largest populated poor countries in the World. More than 80% peoples are poor. So poverty is another issues for the developing our country as well as education sector.

1.6.4. Rural Population

Geographical division most of the people i.e. more than 80% people live in the rural areas. The rural infrastructure does not provide all facilities necessary. The infrastructure for delivery of education is no exception.

1.6.5. Meager Educational Resources

Bangladesh is one of the developing countries of the 3rd World. Ratio of educational resources to the number of people is negligible. The number of

educational institutes is not per as our needs. Also most of the existing institutes suffer from a lack of good teachers and proper educational resources. Most of the quality institutes are established in the urban area. As a result most of the people do not get the opportunity for a proper education.

1.6.6. Lack of Educational Institutions

We noticed that Bangladesh is a large populated country. The numbers of existing educational institutions do not fulfill our needs. As a result large portions of our people do not get access to educational resources. So lack of educational institutions is another issue in our education sector.

1.6.7. Lack of Qualified & Experienced Teachers

As a profession teaching is a novelty. But generally we lack in communication skills. Once upon a time, many took up teaching as their profession. But the number is decreasing day by day. The current salary scales of teachers are not enough to fulfill needs of the teachers. Highly educated people therefore do not want to be teachers. As a result the number of qualified teachers decreases day by day. So for proper education this has become one of the major issues in our country.

1.6.8. Migration

The living style of rural areas has not developed in comparison with urban areas with regards to communication, health, education, food and so on. The scope of work for people has not increased. Most of the people of the rural areas depend on agriculture. Often they are unable to fulfill their daily needs. So, people migrate from rural areas to urban areas better work prospects, better life style, better food, better medical treatment, better education and so on. This is another issue that is affecting the education sector.

1.7. *The solution in the Context of Bangladesh*

Due to economic constraints, it is not possible to provide everyone with on-campus education, though improving and expanding education are

essential ingredients of national development. In Bangladesh, all traditional educational institutions together can enroll only a portion of the long queue of aspirant would-be learners. Reasons are: (1) for accommodating more participants, more infrastructures have to be developed, which is costly, (2) there is no external sources of revenue, (3) limited number of trained teachers, (4) diversified preference of the participants, (5) inflexibility in terms of delivery time and space, etc. Private universities are a relatively recent phenomenon. However, the cost of enrollment at such universities is beyond the reach of most people. So DL has a very crucial role to play. In addition to allowing more participants from different backgrounds, environments and geographical settings without placing any demands on scarce on-site space, DL systems also offer the educational institutions more revenue. DL system is a way of reaching the rural masses. In this case, the average cost (AC) per participant goes down as the number of enrolment goes up [3].

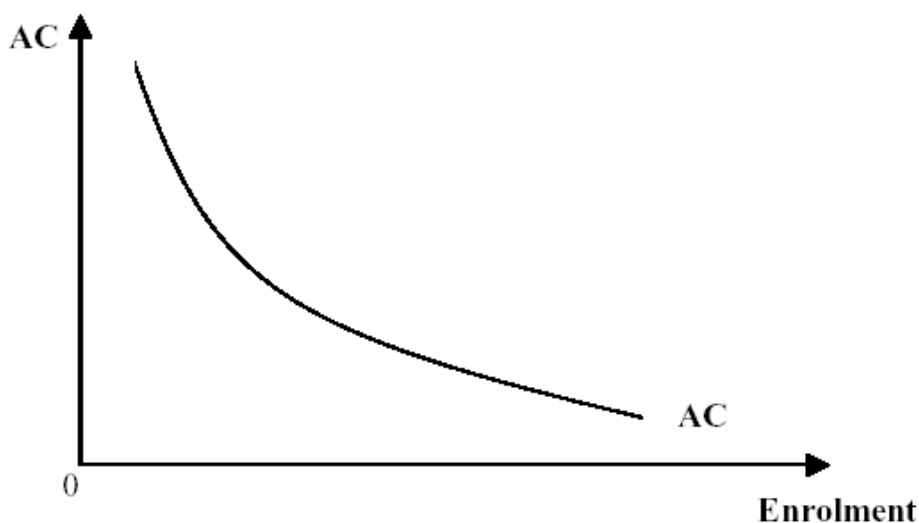


Figure 1.7 Relationship of Average Cost (AC) for student enrolment

On the other hand, the participants who need to help out at home to earn money can take courses through distance mode at their convenience. We will explain with definition of Distance Learning (DL) and its process of our country follows:

1.8. What is Distance Learning (DL)

The term distance learning means different things to different people. As the meaning of the term varies so also the delivery techniques used by different users and institutions. Many different researchers to a great variety of programs, providers, audiences, and media have applied the terms “distance education “or” distance learning interchangeably. Its hallmarks are the separation of teacher and learner in space and/or time (Perraton, 1988), the volitional control of learning by the student rather than the distant instructor (Jonassen, 1992), and noncontiguous communication between student and teacher, mediated by print or some form of technology (Keegan, 1986; Garrison and Shale, 1987) [<http://www.uwex.edu/disted/definition.html>].

The Instructional Telecommunications Council defined Distance Learning as: "The process of extending learning, or delivering instructional resource-sharing opportunities, to locations away from a classroom, building or site, to another classroom, building or site by using video, audio, computer, multimedia communications, or some combination of these with other traditional delivery methods."

The California Distance Learning Project's defined Distance Learning as: "Distance Learning (DL) is an instructional delivery system which connects learners with educational resources. DL provides educational access to learners not enrolled in educational institutions and can augment the learning opportunities of current students. The implementation of DL is a process which uses available resources and will evolve to incorporate emerging technologies [2]."

1.9. Current Distance Learning in Bangladesh

The Open University and a few of daily Newspapers of Bangladesh are providing distance learning in Bangladesh. The current policy and deliverables of distance learning program of Open University and newspapers is described below.

1.9.1. Open University

Bangladesh Open University (BOU), the only distance learning (DL) university in Bangladesh, was established on October 21, 1992 by an Act of Parliament to overcome the barrier issues of our education sector. Its prime objective is to transform the country's vast human resources into an educated and trained work force by extending to them a wide range of academic programs both formal and non-formal by using different delivery technologies [10], [<http://www.citechco.net/bou/>].

Distance Learning (DL) programs of BOU are popular and becoming popular in recent years because it can provide adults and/or female single parents with a second chance at a college education; reach those disadvantaged by limited time, money, distance or physical disability; update the knowledge base of workers at their places of employment; expand cultural background; learn a new language or start a degree program that was postponed due to family or career needs. The several programs, which, are offered by the Bangladesh Open University (BOU), are shown below.

Table 1.9.1
Academic and Non Formal Programs of the Bangladesh Open University

a. List of Approved Formal Programs of Bangladesh Open University, 1996		
<i>School</i>	<i>Formal Programs</i>	<i>Level</i>
Open School	1. Secondary School Certificate (SSC)	Certificate
	2. Higher Secondary Certificate (HSC)	Certificate
School of Agriculture & Rural Development	1. Certificate in Agro-processing	Certificate
	2. Poultry and Livestock	Certificate
	3. Pisciculture & Fish Processing	Certificate
	4. Diploma in Agriculture Education	Diploma
School of	1. Certificate of Education	Certificate

Education	2. Bachelor of Education (B. Ed)	Bachelor
	3. Master in Education	Master
School of Social Science, Humanities & Language	1. Bachelor of Arts	Bachelor
	2. Certificate in English Language Proficiency (CELP)	Certificate
	3. Bachelor of English Language Teaching	Bachelor
	4. Certificate in Arabic Language Proficiency	Certificate
School of Business	1. Certificate in Management (CM)	Certificate
	2. Diploma in Management (DM)	Diploma
	3. Bachelor of Commerce (B.Com.)	Bachelor
	4. Masters in Business Administration	Master
School of Science and Technology	1. Diploma in Computer Application	Diploma
	2. B. Sc in Nursing	Bachelor

b. List of Approved Non Formal Programs of Bangladesh Open University, 1996	
<i>School</i>	<i>Program Name</i>
Open School	Basic Science and Mathematics
School of Agriculture & Rural Development	Agriculture, Pisciculture & Fish Processing, Afforestation & Horticulture, Poultry & Livestock
School of Business	Bank Loans & Marketing Management
School of Business/School of Agriculture	Preparation & Preservation of

& Rural Development	Food
School of Science & Technology/School of Business	Health, Nutrition and Population Studies
School of Science & Technology/School of Education	Maternity & Child Care Environment
School of Social Science, Humanities & Language/ School of Agriculture & Rural Development	Irrigation Management
School of Agriculture & Rural Development/School of Social Science, Humanities & Language/Open School	Religion and Ethics

Technology explosion in the field of DL during recent years has not only revolutionized the teaching and learning environment but has also opened many new options for delivering distance education program. A variety of technologies such as print, audio, video, audio graphics, audio conferencing, video conferencing, web conferencing and www are used for delivering DL materials.

BOU uses different delivery technologies to extend education to every community, even to the most remote rural areas; thereby contributing to the alleviation of poverty. Age, time, place and pace do not restrict learners at BOU. The BOU cumulatively enrolls 251,413 students each year [4] [11]. Currently BOU has more than 300,000 students.

Bangladesh Open University (BOU) mostly depends on Corresponding Model print media as the basic delivery media in its programs. It also uses multimedia model-the second generation of DL (Raylor, 1995) such as audio-video technology. It also uses the Tele learning model such as broadcast TV/Radio.

Bangladesh Open University (BOU) offers Master, Bachelor, Diploma and Certificate programs. In 2002 BOU offered a total of 230 courses of study

over two terms period. BOU mostly depends on Correspondence Model-print based delivery technology and non-printable delivery technologies are used as a supplementary component of print based delivery. The figure 1.9.1 shows the deliverables of materials, which are delivered to the students [6].

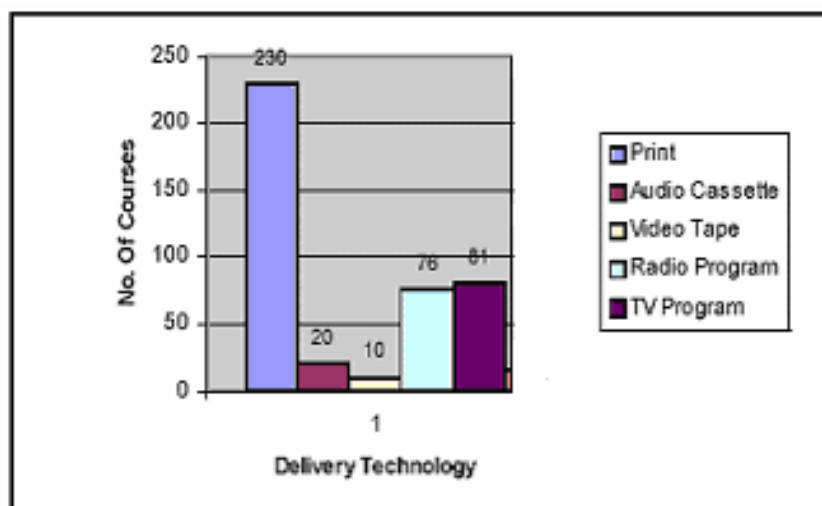


Figure 1.9.1 The use of different delivery technologies by BOU

1.9.2. News Papers

During the last few years, some of the newspapers of Bangladesh have become involved to Distance Learning (DL). Every day they deliver course materials through newspapers. So this way of learning increasing the amount of learners day by day in our country.

But the following figure shows that the BOU is changing their way of deliverables from print to other media. Here we found that in 1998-2002 the Audio Cassette deliverables increased significantly low, the deliverables through Video Tape increased a very low amount, the deliverables through Radio Program decreased and the deliverables through TV Program also decreased. From the figure 1.9.2 we identified that, BOU always delivers their deliverables to the participant through printed media [6].

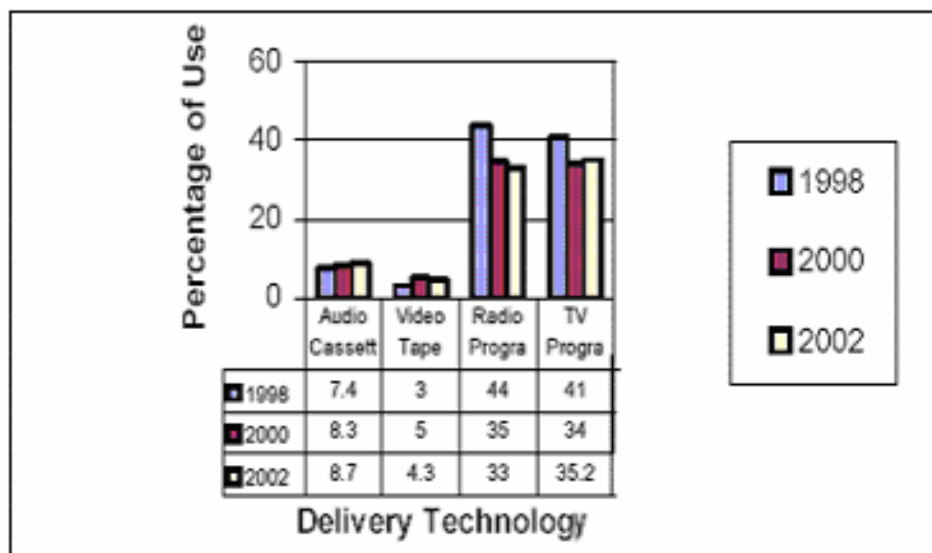


Figure 1.9.2 Comparison of different non-printable media used in three different years

1.10. Problems with Current Distance Learning in Bangladesh

To study the current distance learning in Bangladesh we identified the following problems:

1.10.1. Pre-recorded telecast

We saw the Open University program in BTV as the presenter presents his/her lecture that was recorded a few days ago or before the starting program. The programs are not delivered “live”.

1.10.2. No-interaction between presenter and participants

We also found that they're no way for interaction between presenter and participants. The presenter presents his/her lecture and the participants can listen and see the presenter when the program is going on. So if the participants want to ask a question to presenter it is not possible at the time.

1.10.3. No feedback and no monitoring the quality of lecture

There is no way to get feedback from the participants. As a result the presenter does not know about his/her teaching method is effective or not. The current DL in Bangladesh has other issues that there is no way of

monitoring the quality of lectures. The presenter always gives his/her lectures one way. Are the lectures effective? Are participants understanding the lecture or not?

1.10.4. No monitoring how many people are attending

There is no way to monitor to the participants. The presenter does not know whether any of the participants are attending to the session or not, has no idea of participants progress and so on. These issues also occur when newspapers and printing media are used for delivery of educational materials.

1.11. *Solutions Abroad*

From the review of several Documents, papers and Internet browsing we identified the following tools to solve our current Distance Learning also educational problems.

1.11.1. On-line

In the Internet-based courses, all teaching and learning takes place through the Internet. The course management web page is prepared by the course director using the web courseware. Students interact with the instructor and classmates through a course management website or using regular e-mail. This approach is considered as asynchronous learning. Bournes, McMaster, Rieger and Campbell (1997) have described how to effectively employ this type of learning for on-line courses. E-mail is a major communication channel to students outside the class. During the fall semester of 2002, the particular course director received around twenty five hundred e-mails from students for a class size of twenty-five and more than twenty five hundred mails were sent to students from the course director. The regular university e-mail accounts outside the courseware can do the job; however, the web courseware does help in better management of e-mails to and from students. Since it is within the courseware, and only for the course users, missing an e-mail from student is less likely to happen than using the regular e-mail account. The homework assignments and projects were mostly written

with Microsoft WORD. They are submitted as attachment and delivered and returned by using e-mail. The learning can occur at any time and any place. However, there is limited or no interaction between students and instructor during a lecture [8].

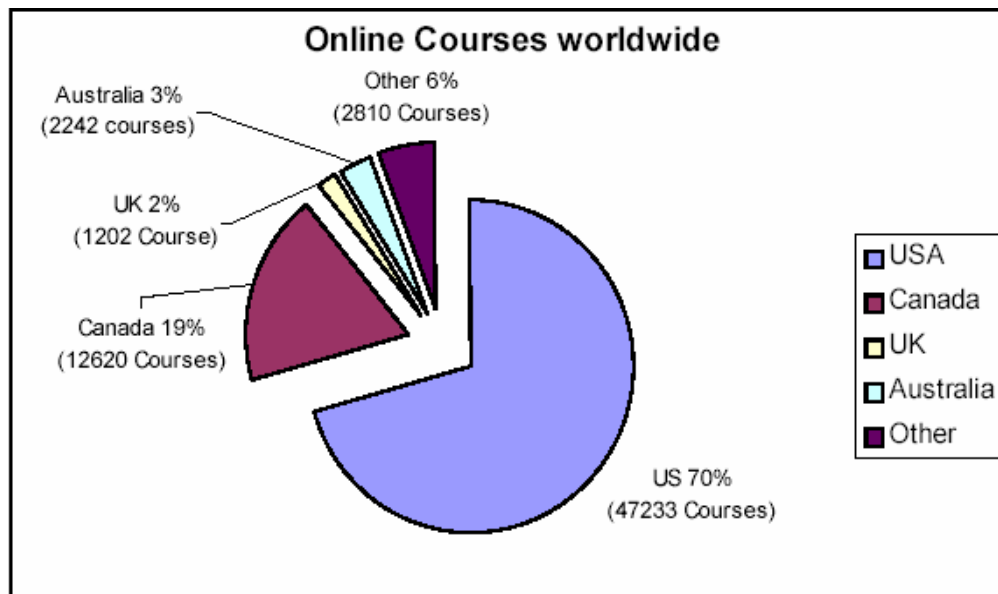


Figure 1.11.1 Distribution of Online courses worldwide

Let's see some statistics of online courses, 89% of online courses originate from North America. The USA is the first offering 70% of all online courses worldwide. Canada is the second with 19% online courses. Australia, a country with a relatively small population is third with 3% of online course [6].

1.11.2. Chat Rooms

Chat room discussions are conducted at specific times during weekdays as announced by the course director. Discussions also occur based on the requests by some students for meeting at the time that is convenient to them. Whiteboard was introduced to students but was hardly used. All the lecture notes and assignments were posted on the web page in Adobe® Portable Document Format (PDF) or in MS Word Format. It significantly reduces the file downloading time for students. It similar to e-

mailing system but has a tiny difference. In this system student can ask question directly to the instructor [5] [8].

1.11.3. Computer Mediated Communication (CMC)

Computer mediated communication refers to any written interaction that is generated and transmitted with the use of computer technology. It can provide a number of facilities including mail and real time chat capabilities that can be used to deliver instruction or to conduct online seminars and collaborative working on documents and projects. CMC can also be used to facilitate group discussions and to enable interactions between tutors and learners, irrespective of time and place constraints. It has been claimed that CMC can be used as a powerful tool for group communication and cooperative learning.

1.11.4. Tele-courses

The Tele-courses are video-based courses delivered through videocassette tapes and video broadcasting. When using video broadcasting, learning take place at a scheduled time. It is called synchronous method. However, there is limited or no interaction between students and instructor during the lecture [12].

1.11.5. Video Conferencing

Videoconference courses generally take place in videoconferencing rooms. The instructor facilitates the course from one campus or learning center and simultaneously broadcasts to other locations. Each Videoconference room is equipped with full motion sensing, interactive, two-way audio and video systems. Students can see and interact with the instructor and classmates at other locations at all times. It is an interactive and synchronous learning system [8] [12].

1.11.6. Audio Learning

Audio learning represents the second broad category of distance learning media (e.g., cassette tape, CD, and phone). Representative of this

category would be a lecture that has been audio taped and is provided to the student for study purposes. Bork (1995) notes that interaction is not generally characteristic of this medium; however, Newlands and McLean (1996) exemplify how the combined use of multiple audio media can in fact enhance student learning and interaction. In their study they complemented audiotaped lectures with telephone conferencing sessions conducted by tutors. Tutors were taught to compensate for the lack of eye contact and body language with “more precise . . . use of language” (p. 4) and increased verbal fluency. Student opinions of this learning experience were positive [12].

1.11.7. These Solutions in the Context of Bangladesh

However, these solutions are not suitable for Bangladesh. The reasons are described in follows:

For on-line based solution we need the following equipments to connect with Internet:

- Computer
- Telephone line for dial-up connection or
- Broadband connection.

Currently total computer user of Bangladesh is about one million (**Computer Jagot, 2004**). To buy a computer we need a least 20,000 Taka. The price of a computer is not affordable for all classes of people. As a result the numbers of computer user are increasing very slowly.

Now a days using computers is one of the best ways for communication in the world. But the current infrastructure of our country does not support this technology. For this technology (e-mail) we need a computer with Internet connection, which is not available for all and also costly. The ISP companies do not cover all 64 districts. Probably 0.2% peoples of our country got the opportunity to use Internet. Most of them (more than 99% out of total 0.2%) are living in the capital city Dhaka, and other main cities Chittagong, Rajshahi, Khulan, Barishal and Sylhet. A few of people of district cities get the opportunity of using Internet. It is expensive and not popular. We will describe the current Internet services available in Bangladesh.

1.11.8. Internet Service

1.11.8.1. Expense of Internet

Current rates for online Internet access:

Initially every ISP took US\$250 for registering a normal subscriber and US\$125 from a student subscriber. Today the rate has dropped to US\$125 and US\$75, respectively. The online charge is Tk.0.50 per minute. Now, if a subscriber on average uses the Internet for three or four hours a day and 120 hours a month, his/her online bill per month will amount to Tk.2000, which is certainly too much for our country. Moreover, as the speed of data transmission in the telephone lines is slow because of low-speed telephone cables and around 40 phone lines connected with the 64 kbps VSAT-based server, Web browsing is very expensive. As a result users remain alert regarding consumption of time and use mainly off-line e-mails [9].

Recently some companies provided online service through broadband connection. However, their rate is again too high. The data transfer rate has increased. Because of their current online service charge it is not possible to use a broadband connection for most of the online users.

Though some people have computers it is not possible to all of them to afford the expense of Internet. Internet is a very expensive media in Bangladesh. So Internet is not available to most of the people in Bangladesh.

1.11.8.2. Internet Speed

Video conferencing requires high bandwidth. The Internet speed in Bangladesh is very slow. Still we do not have optical fiber cable for data transfer. So it is not possible to run distance learning through video conferencing in Bangladesh.

1.11.9. Why Tele-course is not a possible solution

It has been supposed that the development of telecommunications technology in Bangladesh is the monopoly of the government-regulated Bangladesh Telephone and Telegraph Board (BTTB). Although the government claims that it is deregulating the sector for rapid privatization to

encourage healthy competition, the effect of this is yet to be seen. Fear of unrest among unruly employees' unions is the main reason. The telephone cables in Bangladesh are mainly underground and copper-wire based. BTTB currently operates more than 600,000 lines, which it plans to raise to 1,000,000 by the year 2005. Of the current lines, 80% are digital and rest are analog-type. The government is also trying to transform the analog system to digital. Most of the telephone exchanges are operating with age-old equipment; many rural exchanges are still using the obsolete magneto and CB technology. A large proportion of phone lines remain dead at any time and customers must pursue illegal ways to make them workable. An applicant on average waits one month to get a telephone line at the usual charge (US \$200). The charge for a local phone call is Tk.2 and for a long distance call is around Tk.10 per minute [7].

The infrastructure of Tele-communication did not develop at that much of our country where all locations did not bring under the Tele-communications. So the current infrastructure of Telecommunication does not suitable for implement Tele-course for distance learning.

1.11.10. Why Chatting is not a possible solution

It is another electronics media, which can support distance learning through messaging in many countries. Also for this technology we need a computer with Internet connection. But in the context of Bangladesh the current infrastructure does not support interconnectivity throughout the country. The reasons as like as E-mail service. But this technology is real-time. Here both participants and instructors can communicate instantly through voice chatting [7] [9].

1.11.11. Why Video Conferencing is not a possible solution

In order to be able to run a video conferencing system, the basic components needed are as follows.

1.11.11.1 Monitor

A monitor is needed in order to be able to view the person/people whom you are conferencing with.

1.11.11.2 Camera

The camera is the most obvious piece of equipment that is needed to run a video conferencing system; without a camera, video cannot be captured.

1.11.11.3 Audio

The audio component of a video conferencing system includes speakers through which to receive audio, and a microphone through which to transmit audio.

So to setup video conferencing to implement distance learning in our country we need a large amount of investment and current infrastructure does not support to set up video conferencing system for distance learning system.

1.12. *What is the acceptable solution?*

From the above discussion we found that we have to create an acceptable solution that would be suitable for Bangladesh. Satellite television now allows broadcasts to reach any part of Bangladesh, of course almost anywhere in the world. In the context of Bangladesh especially Bangladesh Television (BTV) broadcasts to all of the regions. Other channel(s) is/are also available in most regions of our country. The number of mobile phone users is increasing rapidly in our country because of its popularity. If a solution for DL could be created using a combination of both these technologies it may be highly feasible. The solution would use

- Television
- Mobile phones

1.12.1. Television

Bangladesh Television (BTV) is available throughout Bangladesh. Every village has at least one TV set which most people watch. With the low price of Chinese TV sets, the number of TV sets in villages has increased. Other companies have also reduced the price of TV sets. As a result the number TV sets are increasing rapidly. This has a resulted in increasing the number of TV viewer.

1.12.2. Mobile

Mobile phone is one of the most popular communication services in Bangladesh. Because of its popularity, the numbers of users are increasing rapidly. There are currently four mobile companies operating in Bangladesh. These are Grameen Phone, Citycell, Aktel and Bangla Link (Seba Telecom Ltd). The cost of owning a mobile phone is decreasing day by day. The technology Short Message Service (SMS) is another way of communication through mobile phones. The cost of an SMS is cheaper than a call. So the SMS is becoming popular worldwide. The use of SMS is increasing in our country also. Now a day's people very often send SMS instead of a call. It is becoming popular in the rural area of our country as well. Figure 1.12.2 shows the increasing rate of mobile user in the rural areas.

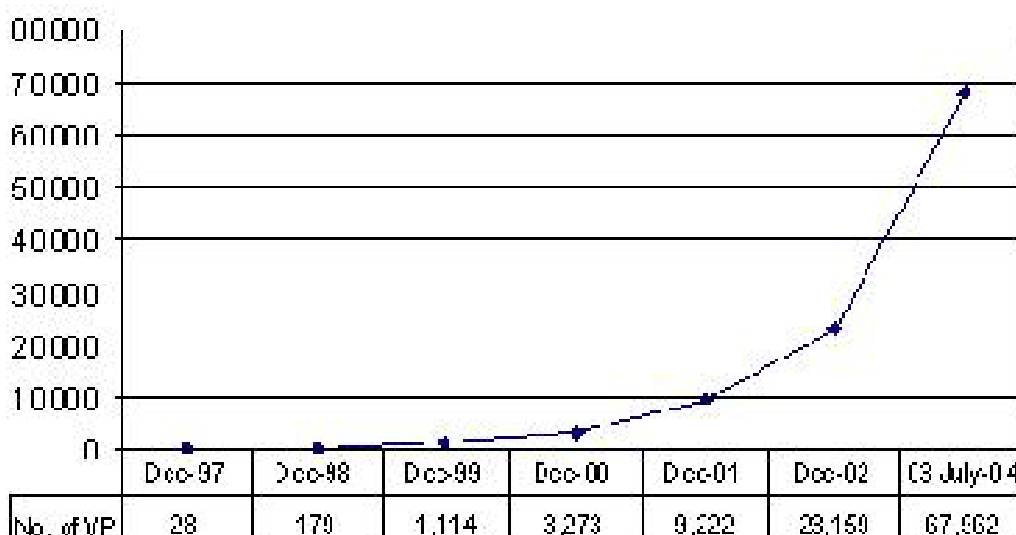


Figure 1.12.2 the increasing rate of Mobile users in Villages.
(Source: Grameen Trust)

GrameenPhone claims that they have more than two million subscribers currently, while **Telekom Malaysia** (Aktel) claims that they have one million subscribers. Adding the sets of **Pacific Telecom** (City Cell 179,058 subscribers June 04, www.citicell.com) & **Bangla Link** (Sheba Telecom (PVT) Ltd.), this would come to over 3.5 millions. The number of mobile sets is increasing rapidly. Within next 5 years, we should have between 6-7 million mobile users.

1.13. Our solution

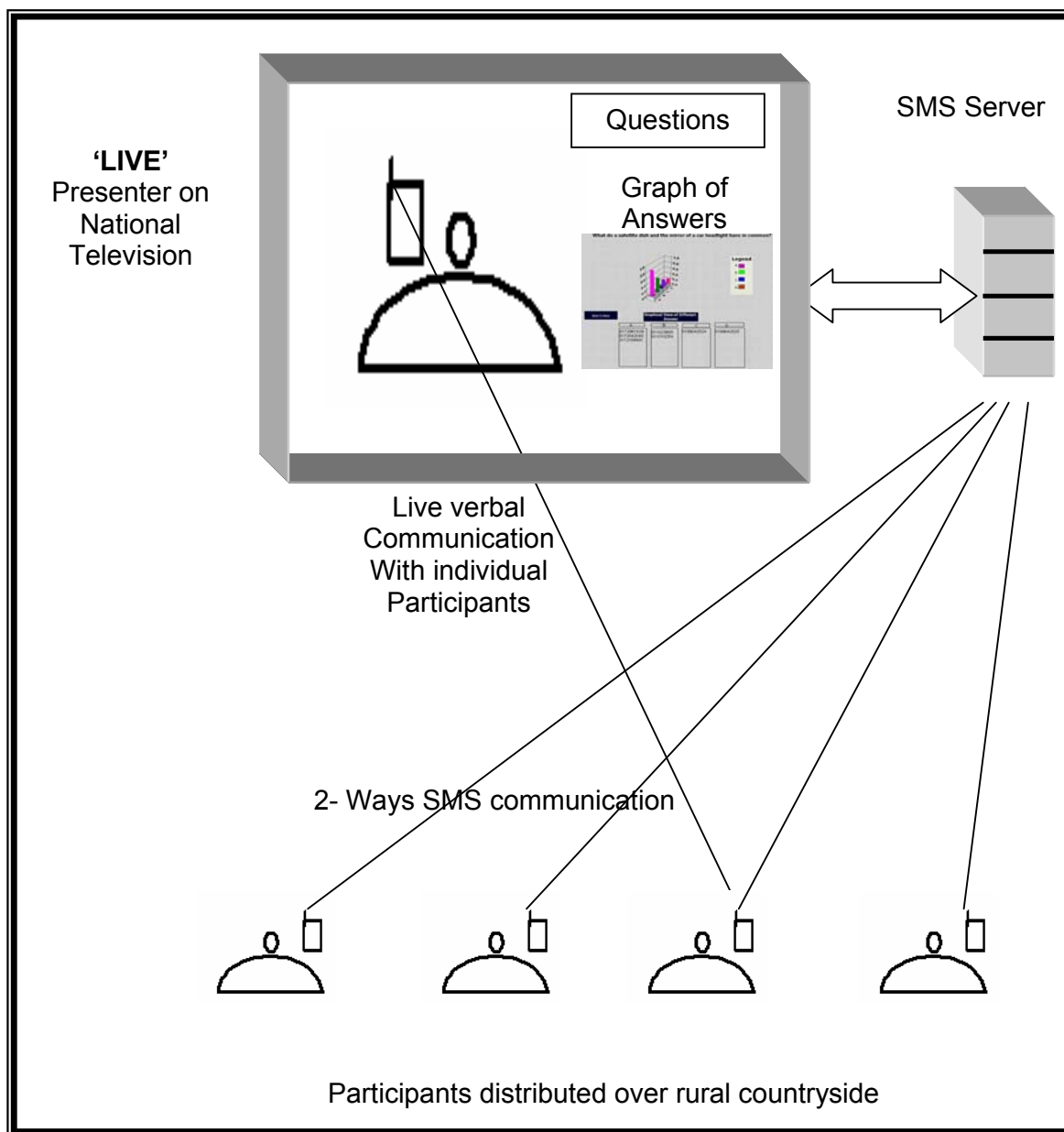


Figure 1.13 Mobile as an Interactive Tool in Distance Learning

We tried to find out a solution that would be acceptable and accessible to the people of Bangladesh. After studying the context of Bangladesh we tried to make a link by using the interaction between television and mobile phone for distance learning.

1.13.1. Live Telecast

Through BTV, it is possible to provide a live telecast classroom at all area of Bangladesh. So after the announcement of a class schedule, the class would be conducted 'LIVE'. The presenter (teacher) will run the learning process and deliver his/her speech. Because of 'LIVE' telecast presenter can ask questions and respond to wrong concepts. The presenter should also be able to ask or talk to participants through mobile phone. He/she can query wrong answers. Conducting the class on national television would allow accessing to greater number of people. A course or a country wide training program can be conducted in this manner.

1.13.2. Question based classes

The lesson would be pre-planned and structured. The presenter (teacher) will provide a lecture on a specific topic. Then he/she will ask a question periodically as the lecture is being delivered. The questions would have multiple-choice answers that would be displayed as A, B, C and D. All the questions for the lesson would be pre-defined and entered into the computer.

The participant would send the answer by SMS. The number of the question should also be included such as **Q2A**, if the chosen answer for **Question 2** is **A**. The server would register the answer against the participant's Identity (registered mobile phone number).

1.13.3. Students respond through SMS

The registered participants (except presenter's conversation) will respond through SMS such as information, registration, and attendance.

1.13.4. Computer Plots Graphs of Question Answer

There is a system that creates a bar chart of the answers. The bar chart would be visible on the Television screen. So presenter and participants can see it. By clicking on the bar, the respondents of that answer can be identified. There is a calling system for interaction with the specific participant through mobile phone conversation that all viewers can hear. The presenter would select a participant (mobile number) and the computer will dial. Being connected, the presenter would ask the student the logic behind selecting the answer. Then the presenter can correct the wrong concept on air. A few other random selections can be made similarly. This would help clear up wrong concepts immediately; “live” during the presentation.

1.13.5. Daily Progress Report (Result)

At the end of the session each participant’s progress report (results) could be sent via SMS saying whether the participant has passed or failed that session. This would encourage the participant to pay special attention in the next session or be pleased that he/she has done well.

Finally a complete record of each student’s performance would be kept. This record would be used to issue participant’s performance notification via SMS and also used to issue results at the end of the training session of a course.

1.14. Benefits of Solution

From our proposed solution we can get the following benefits:

- A large number of people will get the opportunity for better education. So it will help to develop our country, which will bring the prosperity for our nation.
- The teacher’s responsibility also increases as a result we will get better teaching methods from our teacher. So before taking class the teacher’s has to study to deliver his/her lecture to the students to prepare the questions.
- Interactivity will increase the effectiveness of study.

- Example of use: Nationwide training of teachers in various schools or health workers can be conducted in this manner. It is possible to conduct any conference, class and training session using this technology.
- The cost to the participant during a session is around Tk.30/- at current rates for the SMS in our country. The cost can be reduced if the mobile companies agree to reduce their cost structure for educational purpose.

1.15. Block Diagram

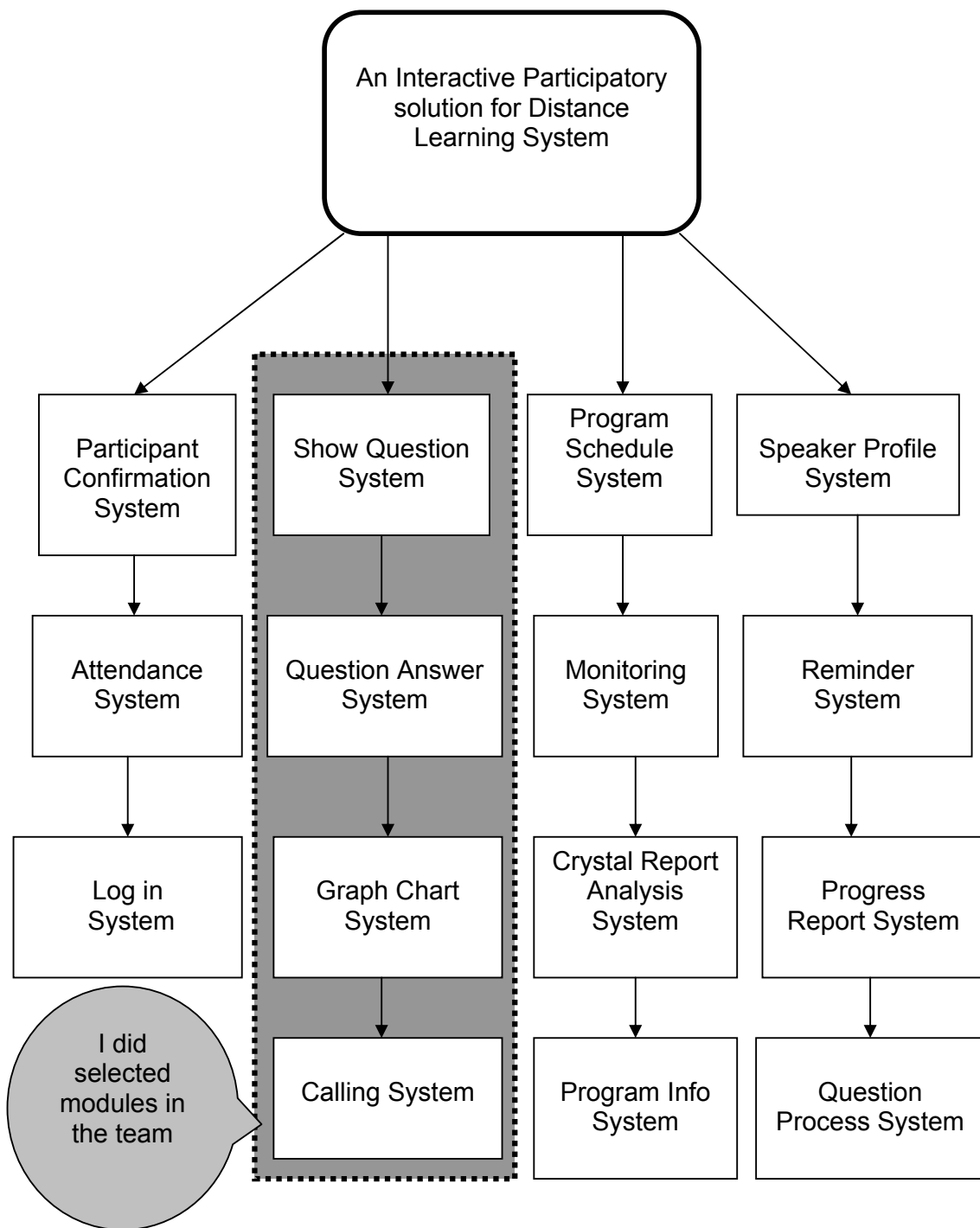


Figure 1.15. Block Diagram of proposed Distance Learning system

The figure 1.15 shows the full system block diagram for an interactive participatory solution to Distance Learning System. There are 15 modules in

the diagram that are distributed to the team members. The list of the team members and corresponding modules are as follows:

Team Members

Modules

1. Shoeb Ahmed

Registration System

Attendance System

Log in System

2. Khalequzzaman

Show Question System

Question Answer System

Graph Chart System

Calling System

3. Shakib Zaman

Program Info System

Program Schedule System

Monitoring System

Report Analyzing System

4. Shafique Shamsur Razzaq

Reminder System

Question Process System

Progress Report System

1.15.1. My Modules in the Team

My modules are shown in the Figure 1.14. The modules are described in depth as follows:

1.15.1.1 Show Question System

During a session presenter will show objective type of question to the participants. Presenter will select specific question from question bank [For

details Ref to Appendix A2] according to the Program ID and then the question will be visible in a list box according to the selected sequence. Then the presenter will select the time limit for answering the question. If he/she double clicks on the specific question then the question will be appear on the screen. After showing the question on the screen the presenter will discuss the question and corresponding four answers. The time will start for sending answer when the presenter clicks on the start button. After the time is up then the correct answer with question is shown on the screen. So the participants can see the correct answer.

1.15.1.2 Question Answer System

After showing the question on the screen and answering time is started then the question answering system starts its work. In this system it will receive the question answer from the participants. The answers to the given question are saved in a log file. From the log file, the question answer system will check the given question answer is found as the given format as “Q1A”, it means the Question Number is 1 and its answer is A. At first it checks the first character of answer is Q or not. If the first character is not q or Q then the question answer system will not receive the question answer. Otherwise it will check the last character is A, B, C and D. If the last character is not one of A, B, C or D then the question answer system will not receive that answer. Otherwise it will check the middle character(s) is/are positive integer(s). If the middle character(s) is/are not integer(s), it will not accept the answer. Otherwise it will do the other works. After fulfilling the above criteria then it will check the log file for the participant's Identity is valid or not according to their registration. If the participant Identity is not valid then it will send a message to the participant that “you are not enlisted”. If the participant Identity is valid then it will check the participant's attendance. If the participant's attendance is not found in the attendance list then the question answer system will send a message, as “you are absent for today”. If the participant's attendance is found in the attendance list then it will check valid time for receiving answer. If the time is not valid then question answer system will send a message to the participant, as “You are late”. If all the criteria are fulfilled then the

question answers are saved in progress report_1 according to the participant Identity, Question number and question answer. The question answers, participant Identity and question no are also saved in temporary graph file to create a graph according to the question answers and participant identity.

1.15.1.3 Plot a Graph chart System

After finishing the time that is set for sending question answer then the graph chart is created. It shows the number of participants according to their answer in four bars as A, B, C and D. A bar shows the number of participants who answered A, B bar shows the number of participants, who answered B, C bar shows the number of participants who answered C, and D bar shows the number of participants who answered D. If the presenter wants to see the number of participants list according to their answer then he/she clicks on the legends then can be visible the lists of the participants in list box. It is visible to the presenter and the participants.

1.15.1.4 Calling System

After viewing the graph on the screen then all the list of participants who sent answer are found in list boxes according to their answer. For live conversation is done by this calling system. From the list of the participants the presenter can select randomly a participant for live conversation. Presenter can ask the selected participant as to what is/are the argument(s) behind the answer. The conversation can be heard by all participants. So from this conversation participants can clear up their wrong concepts.

CHAPTER II

PLANNING AND ANALYSIS MODEL

2.1. Tests plan

The each field tests were performed.

Table 2.1
Validation Test

Name of the field	Validation	Test Input Data	Expected Result	Expected output	Actual Message
Question Answer	First character should be q or Q then question number, then answer	2QC or QC2 or question2C	Wrong	No message , database will not keep the record	Database did not record any message
	Answer can not be sent more than once	Q2C Q2B	Wrong	Reply message and database will not keep the record	"You have already answered"

	There would be no space between q, question number and answer	Q 2 C	Wrong	No message , database will not keep the record	Database did not record any message
	Question number would be that number which question is shown on the screen	Showing question is Q2 input is Q1C	Wrong	No message , database will not keep the record	Database did not record any message
	Question answer must contain at least 3 character	C	Wrong	No message , database will not keep the record	Database did not record any message

	There is no dot(.) or comma (,) or any other character in between Q and then integer number and then question answer	Q2.A or Q.2A or Q.2.A	Wrong	No message , database will not keep the record	Database did not record any message
	Participant Must be registered	+880171442013, this id is not registered	Wrong	Database will not keep the record	"You are not a valid participant"
	Participant must send attendance	+880188042525, this participant did not send attendance	Wrong	Database will not keep the record	"You are absent for to day"
	The last character would be A, B, C or D	2QE	Wrong	No message , database did not keep the record.	Database did not record any message
<i>Graph chart</i>	Participant must send question	No question answer did not find	Graph would not be	No message ,	Database did not record any

	answer		plot	database will not keep the record	message
Calling	Must have participant id in the list box	Participant id did not find	Calling would not occurre d	No message , database did not keep the record	Conversati on did not occur between presenter and participant

2.2. System Request

Project Name: An Interactive Participatory Solution to Distance Learning System.

Department: CSE Department.

Organization: BRAC University.

Phone: 8922041

E-mail: info@bracuniversity.net

2.2.1. Business Needs

To provide a better education to the participants from all over Bangladesh using highly qualified and experienced presenters (teacher) through an interactive participatory virtual classroom.

2.2.2. Functionality

The proposed Distance Learning System provides the following functionality:

1. The participants can get most of the information through proposed DL system.
2. Using SMS participants can get information about their criteria as specific program information.

3. The participants can register from any place through SMS by using the given instructions. An automatic SMS will be sent to the participants as confirmation of registration.
4. Registered Participants will get an alert message just before their class time.
5. All the participants will be monitored by the proposed DL system.
6. Participants can ask question directly through SMS.
7. As presenter asks questions every 5 to 7 minutes, so the participants have to attentively listen to the lecture.
8. Presenter can view the statistics of the participants' progress, so he/she can get instant feed back about his/her teaching methods through proposed DL system.
9. The participants can also view his/her statistics after class or program ends and he/she will get an SMS about his/her daily's progress.
10. The Participants will send their attendance through SMS and then the proposed DL system will confirm the participants attendance.
11. All information will be stored in the DL system.
12. There will some validation in DL system like:
 - Participants must register within due date and time.
 - The registered participants have to send their attendance within 10 minutes after starting a class or program.
 - For sending all types of SMS the participants have to follow specific rule.
13. Finally, the participants will get an automatic SMS at the end of the program / course with their total report (result).

2.2.3. Business Needs

Tangible:

1. Participants will get a geographically dispersed.
2. It is possible to provide effective learning to every region of the country within a short period of time.
3. It is possible to save lots of money for learning and learn without having to migrate or travel to the large cities.

4. Technical education can be reached to every kind of people who has at least some literacy on using a mobile phone by our DL system.

Intangible:

1. It will improve the participants' satisfaction.
2. It will increase the quality of delivery.

2.3. *Special Issues or Constraints*

Current Distance Learning System does not have any real time interactivity and monitoring process. People are familiar with Mobile phone and Short Message Service (SMS) but not with Interactive Distance Learning System. So it will take a few minutes to understand the system of answering. That's why the system will be practically used after giving presentation on the papers and television channels.

2.4. *Feasibility Analysis*

2.4.1. Technical Feasibility:

- Familiarity with Application
 - Current Distance Learning System has no experience with SMS based Learning system.
 - The presenter and participants have very little experience with the application area, aside from the traditional DL System.
- Familiarity with Technology
 - The system development team has to have an idea about the programming and the SMS based application system.
- Project Size
 - We estimate that the project is moderate in size.
 - With some effort we can design the system to be fairly independently.

2.4.2. Financial Feasibility:

- It seems that the cost involve in setup the system is very high. But later it will save lot of money as it will cover a huge number of people.
- The participants have to spend money for the sending and receiving SMS. However, highly technical subjects may also be taught using the DL process, for which otherwise they would have to come to Dhaka.
- So it will save a lot of money as they can do their courses sitting in front of a TV set in their village.

2.5. *Work plan*

2.5.1. Information Gathering Plan

Understanding the current System

- Document Analysis

The project team will review the whole process for the current system and the web site with which the current system will interact. The project team will create the behavioral and structural models for the DL registration process, program information process, Question Answer process, timing process, Graph chart process, show question process, presenter's profile, and student's profile and progress reports.

- Observation

The project team will observe the current system by analyzing the gathered information.

- Problem Analysis

The project team will investigate current enrollment system, deliverables system and management system to identify the key processes and data.

Identifying Improvements

- Root cause Analysis

The project team will identify the problems of current Distance Learning System.

- Duration Analysis
Identify the amount of time it takes to process inputs in the current business process.
- Activity-based Costing
Identify the major processes or steps and costs associated with them.
- Informal Benchmarking
The project team will search for list of features in other Distance Learning System such as Network based, On-line based and chatting based to improve this developing system.
- Outcome Analysis
The project will include outcome analysis to identify potential ideas.

Breaking Assumptions

The project team will include breaking assumptions to identify the fundamental business rules that need to be reengineered.

- Technology Analysis
The project team will consultant information systems staff to develop a list of technologies, and then the team will review the list of technologies that enhance the improvement if installed with the system.
- Activity Elimination
Identify the activities throughout the process and eliminate those activities that will not be need any more.
- Proxy Benchmarking
The project team will search for specific features such Program information, enrollment, progress report, deliverables, monitors, participant and presenter's profile in other Distance Learning System to improve this developing system.
- Process Simplification

Identify program information, registration, deliverables, question answer and progress report processes complexity and break them into simpler subroutine.

Develop a To-Be System Concept

We need some information from the participants and presenters of current Distance Learning System and System developers.

2.6. Analysis Plan

Understanding the current System

- Gather Information

The project team will review the information gathered from document analysis and produce an overview of the current DL system.
- Develop Process Model

The project team organizes use-cases into behavioral model for current DL system.
- Develop Data Model

The project team will identify data to develop a data/structural model for the DL system.

Identifying Improvements

- Problem Analysis

We will examine the current DL system to identify the basic set of features for the proposed DL system.
- Root Cause Analysis

We will identify the basic set of drawbacks of DL system that is going to be solved in the proposed DL system.
- Duration Analysis

We will break complex process into several sub processes to accomplish the process in a relatively simpler way.
- Activity-based Costing

Analyze the cost that is associated with the major processes or steps.

- Informal Benchmarking

We will work to develop a list of features that have been provided by the other Distance Learning System such as Network based, On-line based and chatting based to improve this developing system.

- Technology Analysis

We will develop a list of innovative SMS technologies.

- Proxy Benchmarking

We will develop a list of specific features such as participant's enrollment, deliverables, question answer, participants progress report, participants profile in other DL system and attempts to identify the business value is earning by having those features.

- Process Simplification

The project team will work with proper personnel to develop simpler subroutine by breaking the complexity of proposed DL system.

- Gather Information

The project team will analyze the current system information, behavioral and structural models to develop the information of the To-Be system.

Develop a To-Be System Concept

- Develop Process Model

The project team will organize the developed use-cases into behavioral / process model for the To-Be system.

- Develop Data Model

The project team will develop a data / structural model for the To-Be system.

2.7. Context Diagram

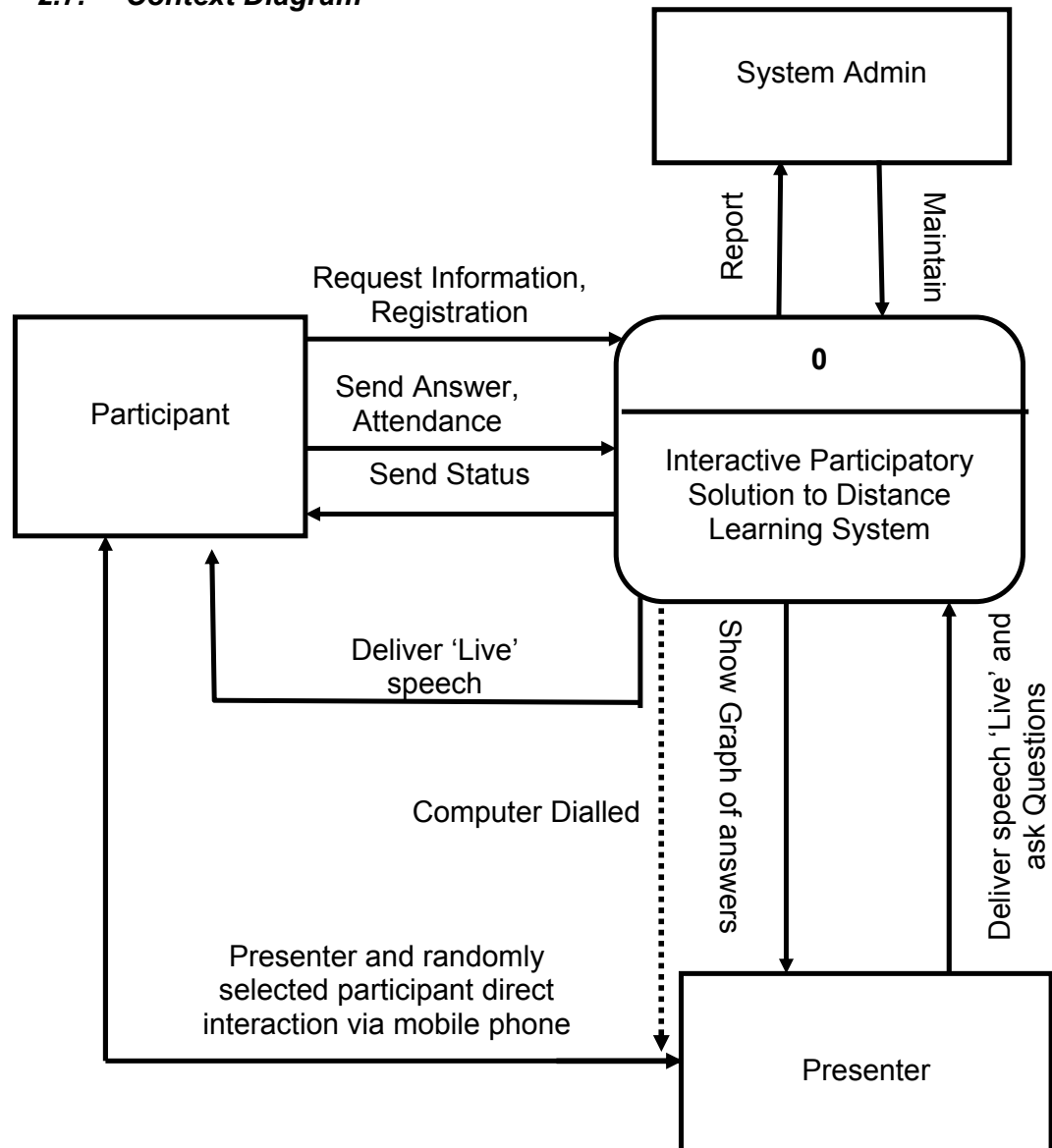


Figure 2.7 Context Diagram for Interactive Participatory Solution to Distance Learning System

The figure 2.7 shows the context diagram for the proposed Distance Learning System. A new participant can request for program information and registration to the system admin through DL system. The registered participants send attendance, question answer through SMS. The DL system sends status of the participants. The presenter delivers live speech and talks to randomly selected participants via mobile phone.

2.8. Data Flow Diagram (DFD)

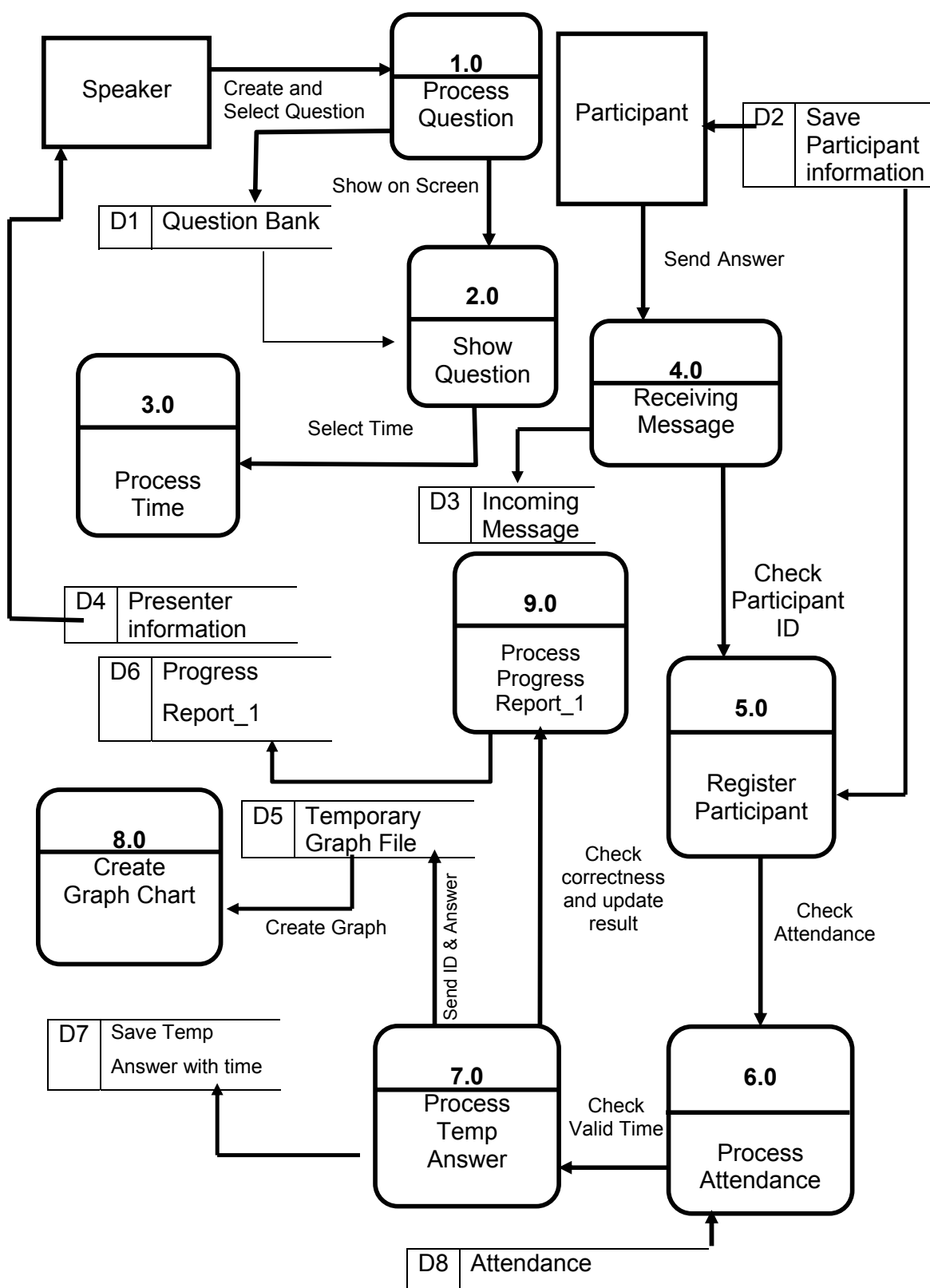


Figure 2.8.1 Level-0 Data Flow Diagram for Interactive participatory solution to Distance Learning System of my modules

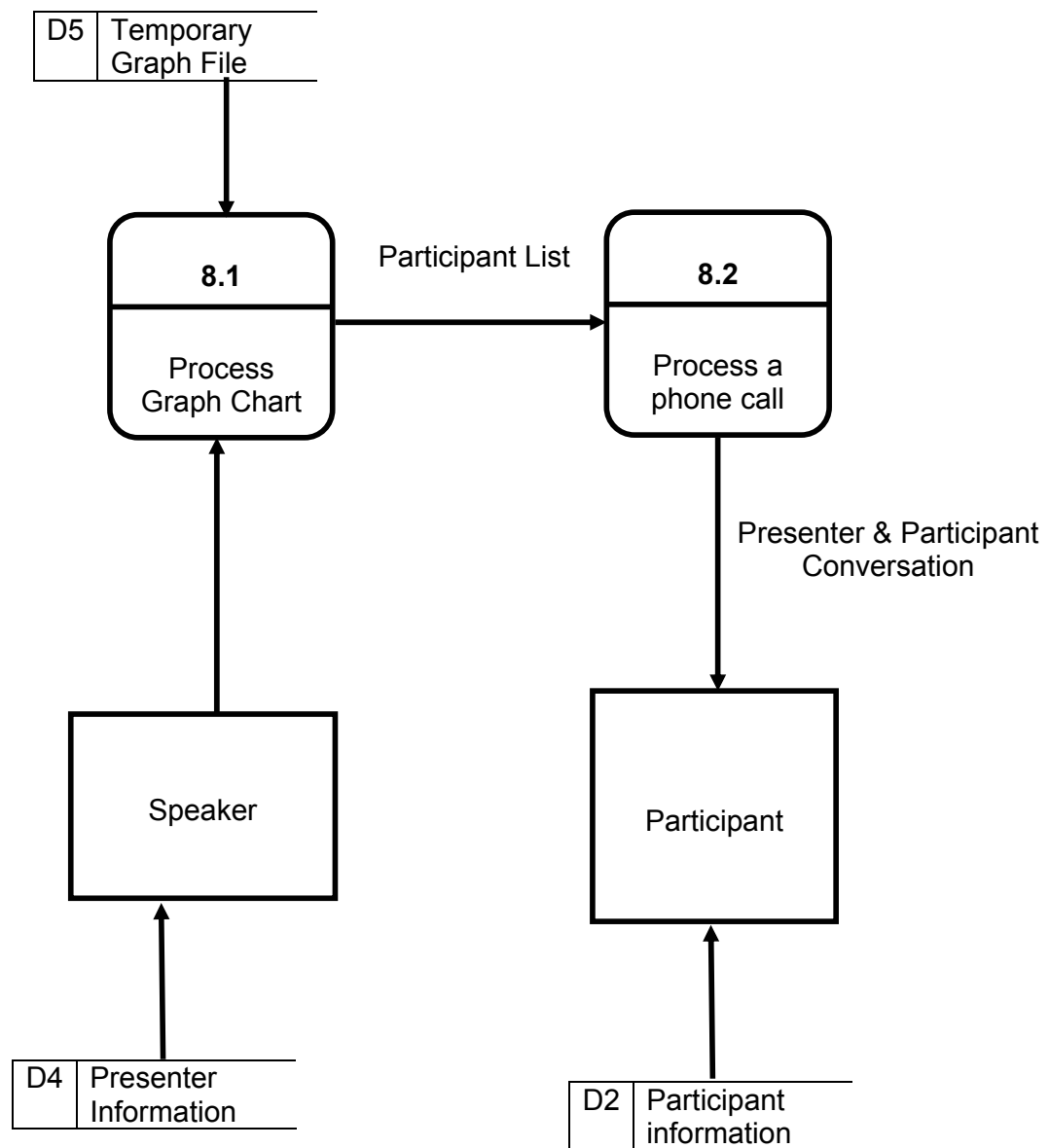


Figure 2.8.2 Level-1 Data Flow Diagram for Interactive participatory solution to Distance Learning System of process 8.0

The figure 2.8.1 shows the Level 0 Data Flow Diagram and 2.8.2 shows the Level 1 Data Flow Diagram of process 8.0 of the proposed Distance Learning system.

2.9. Use Case Diagram

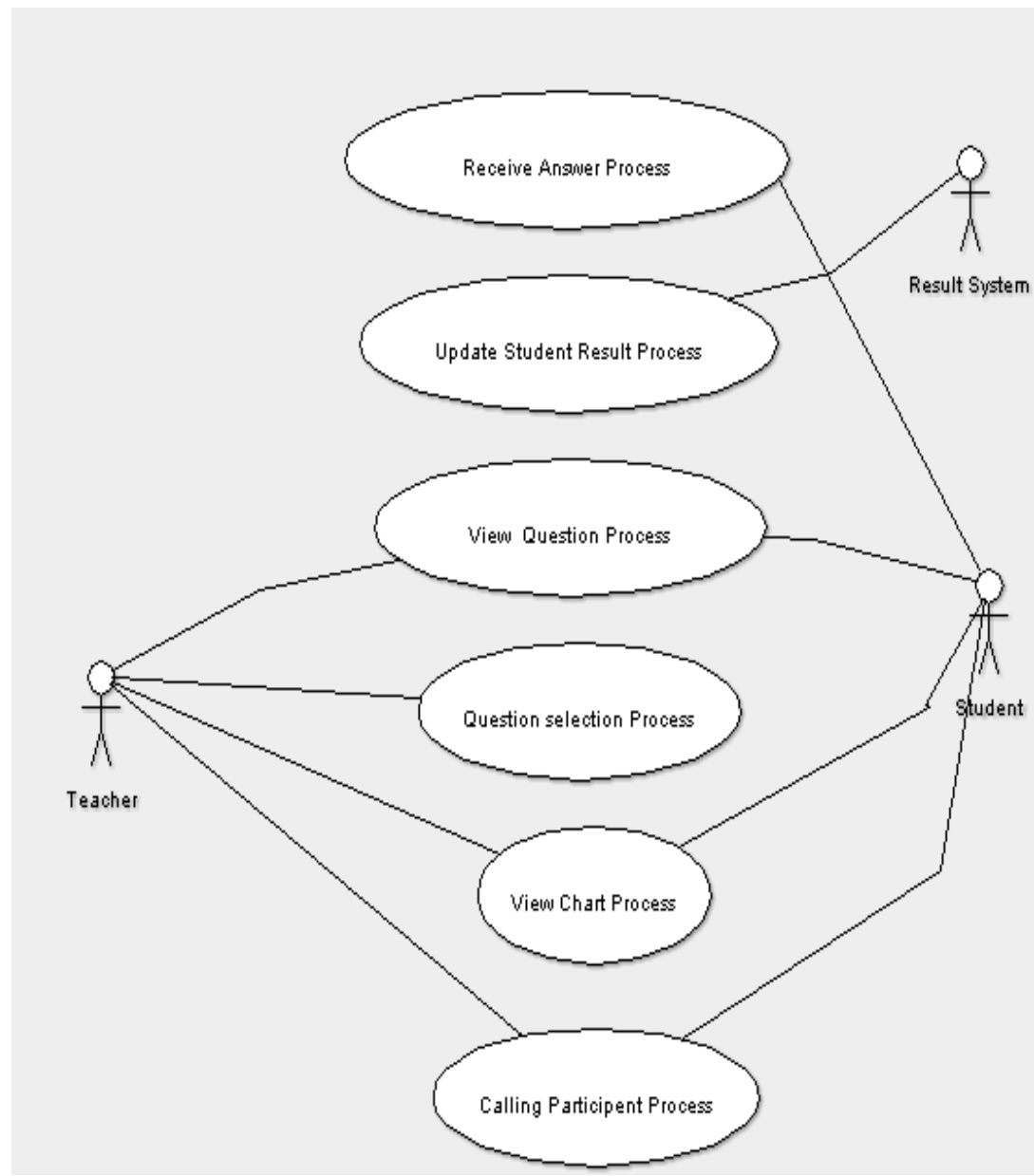


Figure 2.9 The of Use case Diagram for proposed Distance Learning System.

Figure 2.9 shows the use case diagram for proposed DL system. The use case processes are given in the following pages.

2.10. Description of the use cases

Use case name: Show Question	ID: 1	Importance level: High
Primary actor: Presenter	Use case type: Detail, essential	
Stakeholders and interests: Presenter - wants to ensure the selected question is shown question on the screen properly. Participants - want to see the question for sending answer within valid time.		
Trigger: Participants will see question on the screen and understand properly to answer. Type: External		
Relationship: Association: Presenter. Include: Participants Extend: Generalization:		
Normal Flow of Events: ➤ Presenter selects the specific question from a list of question from question Bank. ➤ The selected question's answer and the time are stored in the database on Temp Answer Table.		

Figure 2.10.1 Description of Show question use case process.

Use case name: Question Answer	ID: 2	Importance level: High
Primary actor: Participants	Use case type: Detail, essential	
Stakeholders and interests: Participants- want to send the question answer within due time. Receive Answer- wants to get the question answer from valid participants.		
Trigger: Participants will see question on the screen and then send the correct answer which one he/she assume correct within valid time that is shown in the screen. Type: External		
Relationship: Association: Presenter. Include: Extend: Receive Answer. Generalization:		
Normal Flow of Events: ➤ Participants send question answer through SMS. ➤ Check the participant is registered or not. ➤ If the participant is registered then check participant's attendance. ➤ If the attendance is found then check the valid time for receiving answer. ➤ If question answer found within valid time then restore the answer and update participants result sheet.		

Alternative Flows

*a. At any time, System fails:

To support recovery and correct question answer receiving process, ensure all question answer receiving process steps and events can be recovered from any step of scenario.

1. Admin restart the system, log in, and request Recovery of prior state.

2. System reconstructs prior state.

- 2a. System detects anomalies preventing recovery.

1. System signals error to the students, record the Error and enter a clean state.

2. Participant has to resubmit question answer.

- 3a. System shows error or warning to the admin

- 4a. System may fail to update information for any inconvenience reason of system failure

1. System shows the error messages and asked to restart the Receive question answer process again.

Special Requirements:

1. Need robust, scalable, secure, powerful database system
2. System should have routine builder.

Figure 2.10.2 Description of Question Answer use case process.

Use case name: Graph Chart	ID: 3	Importance level: High
Primary actor: Presenter/Participants	Use case type: Detail, essential	
Stakeholders and interests: Presenter- wants to show the list of the participants who sent question answer and from the list of participants to call any of the participants to ask why he/she selected that answer. Participants- want to response according to the presenter's calls.		
Trigger: Both Presenter and Participants will see graph chart on the screen and also will see the list of the participants for specific answered. A live conversation occurred between presenter and participants. Type: External		
Relationship: Association: Presenter. Include: Graph Chart Extend: Participants Generalization:		
Normal Flow of Events: ➤ Graph chart creates according to the list of Participants of question answered. ➤ Presenter click any of the legend (A, B, C, OR D) and the will see the list of the participants. . ➤ If presenter wants to call any of the participants then he/she selects the id of the participants and then he/she can call the participants by double clicking on the participant's id.		
Special Requirements: 1. Need robust, scalable, secure, powerful database system 2. System should have routine builder.		

Figure 2.10.3 Description of Graph Chart use case process

2.11. Sequence Diagram

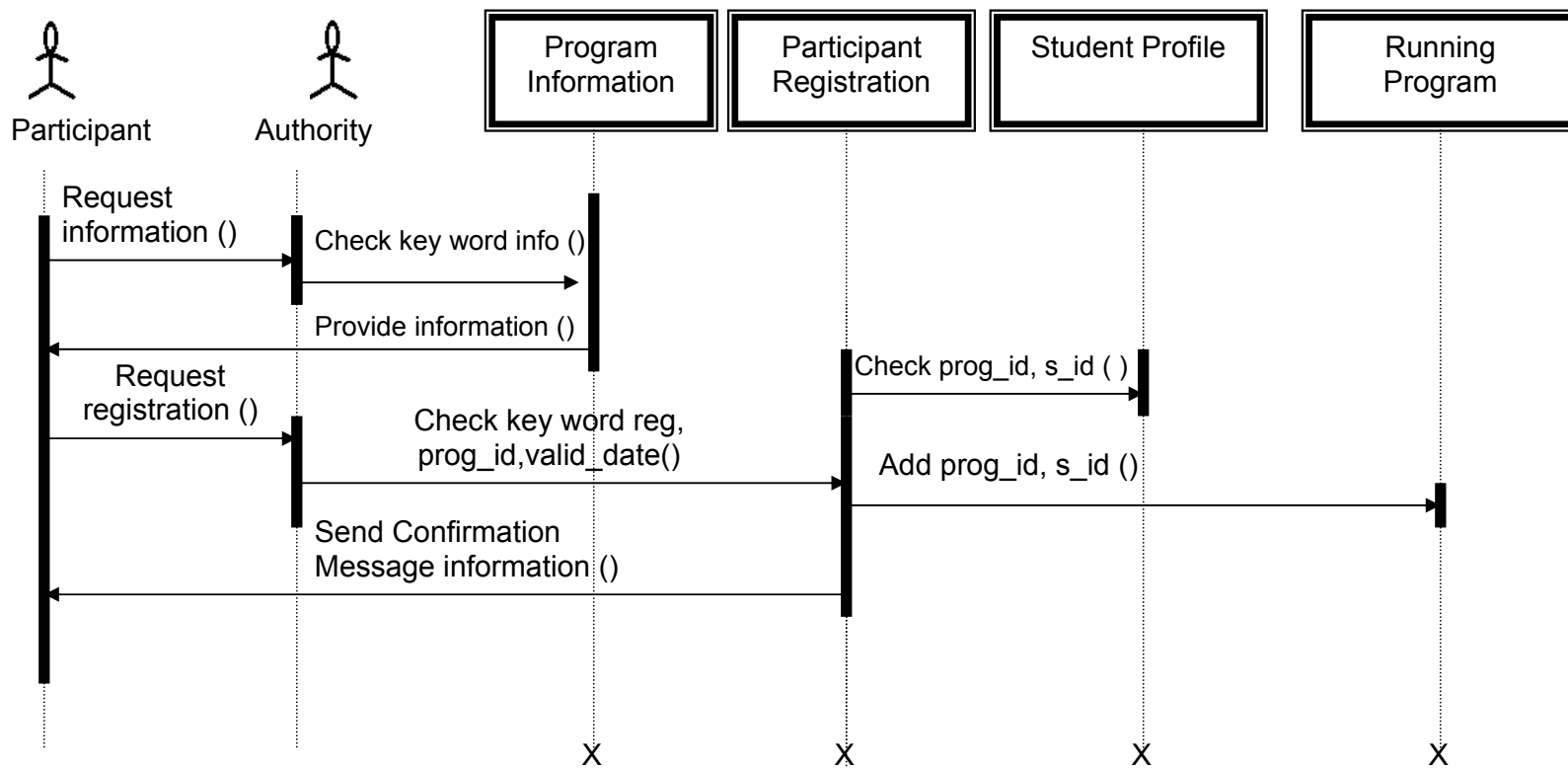


Figure 2.11.1: Sequence diagram for Interactive Participatory Solution to Distance Learning System

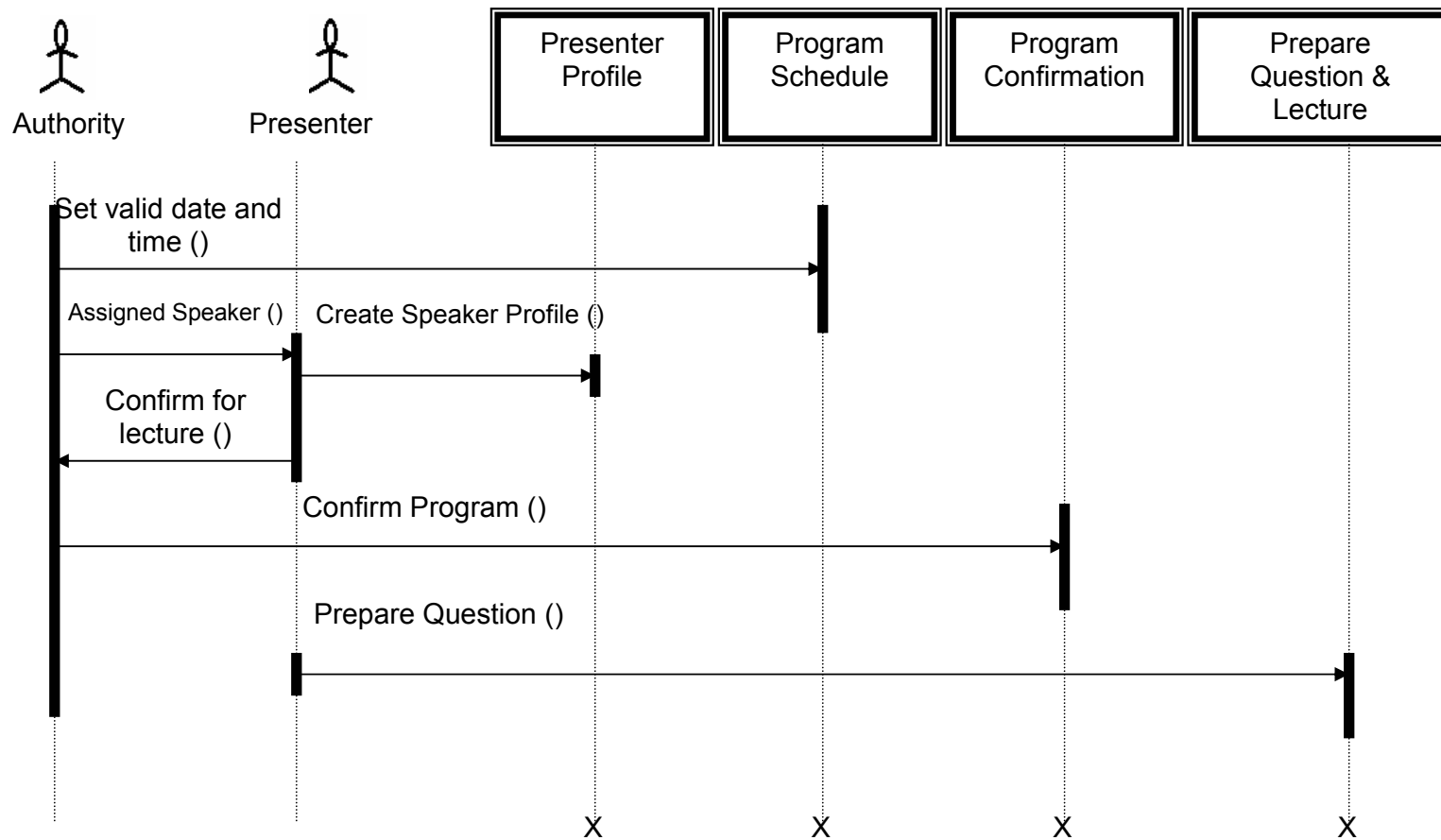


Figure 2.11.2: Sequence diagram for Interactive Participatory Solution to Distance Learning System

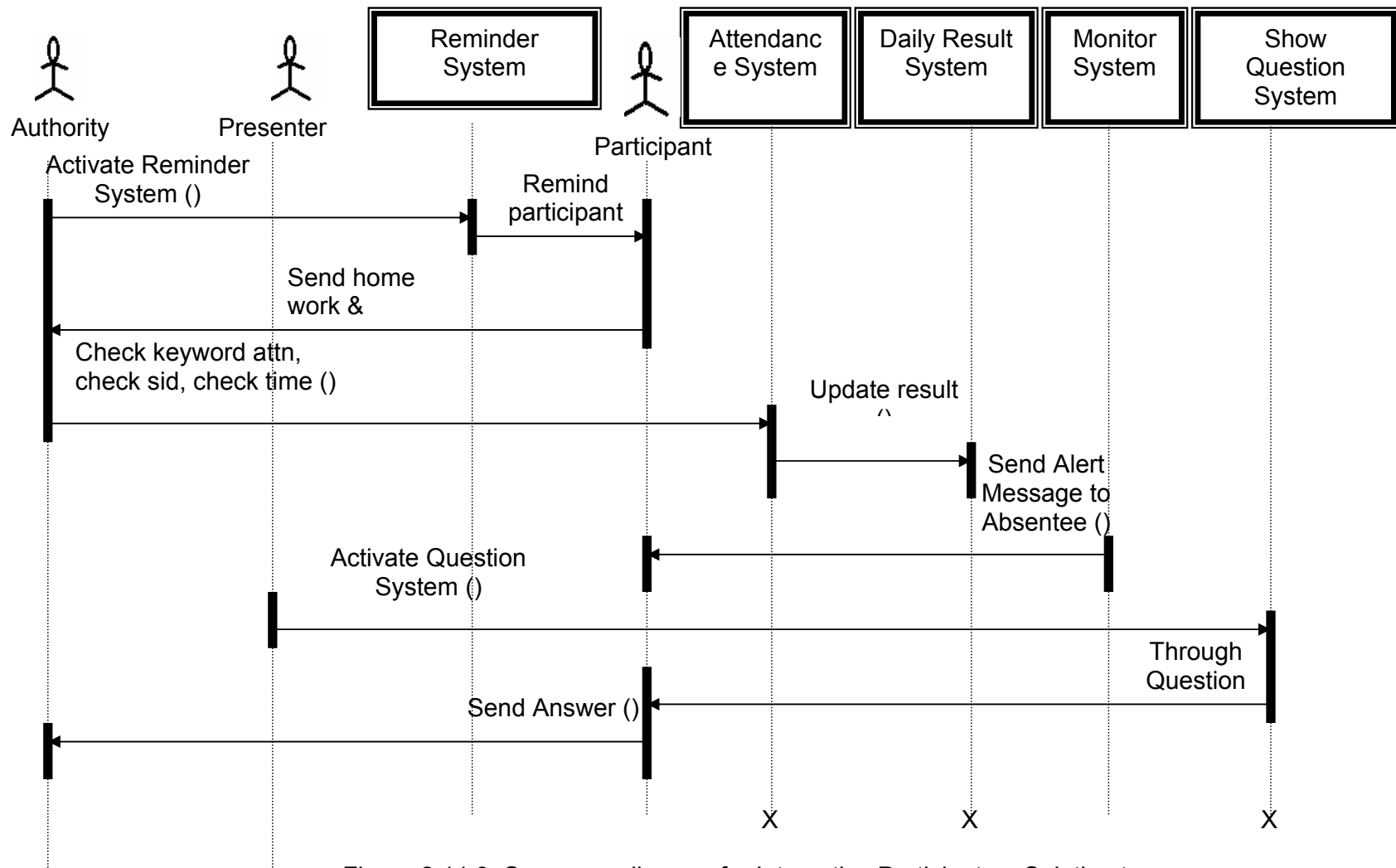


Figure 2.11.3: Sequence diagram for Interactive Participatory Solution to Distance Learning System

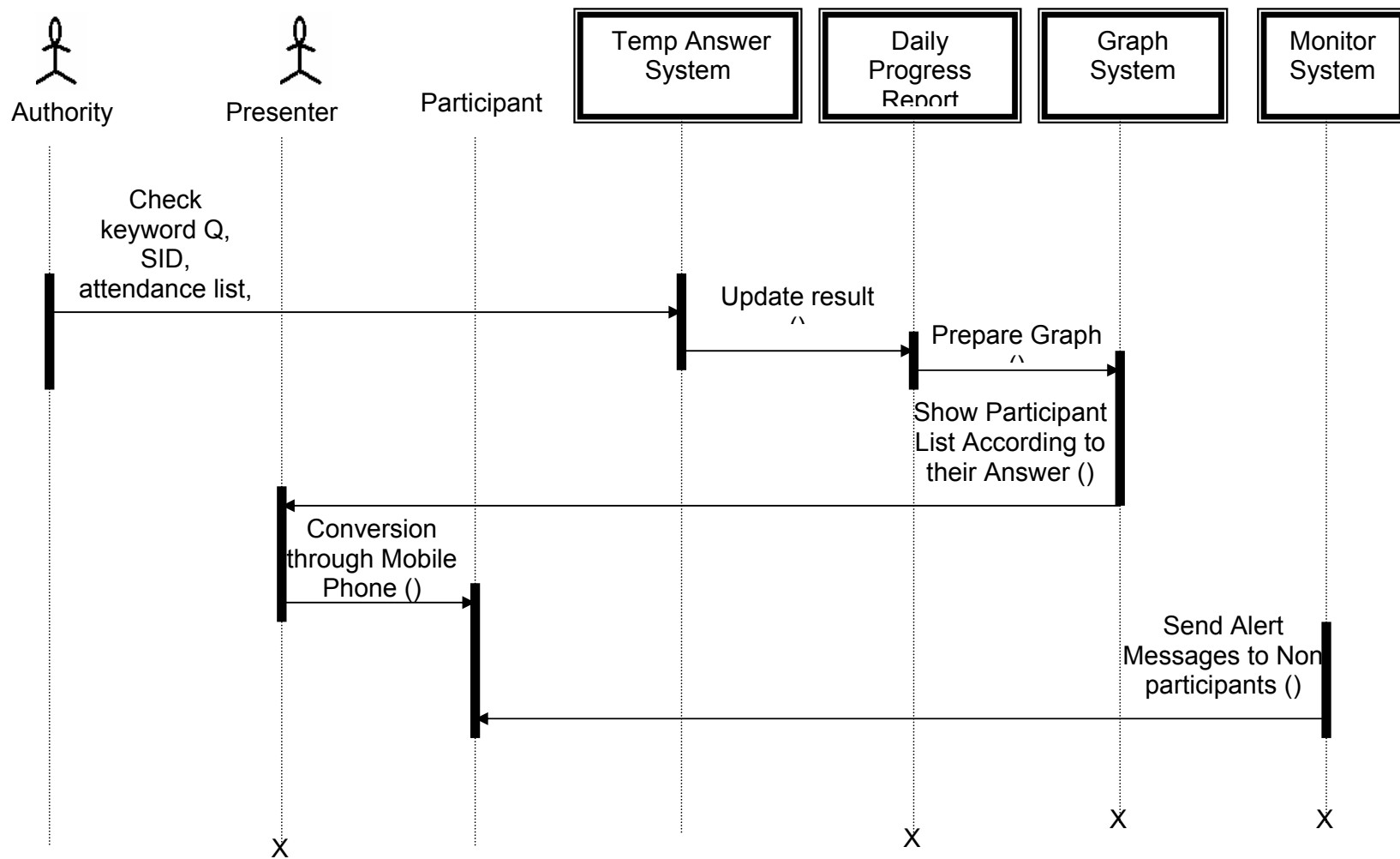


Figure 2.11.4: Sequence diagram for Interactive Participatory Solution to Distance Learning System

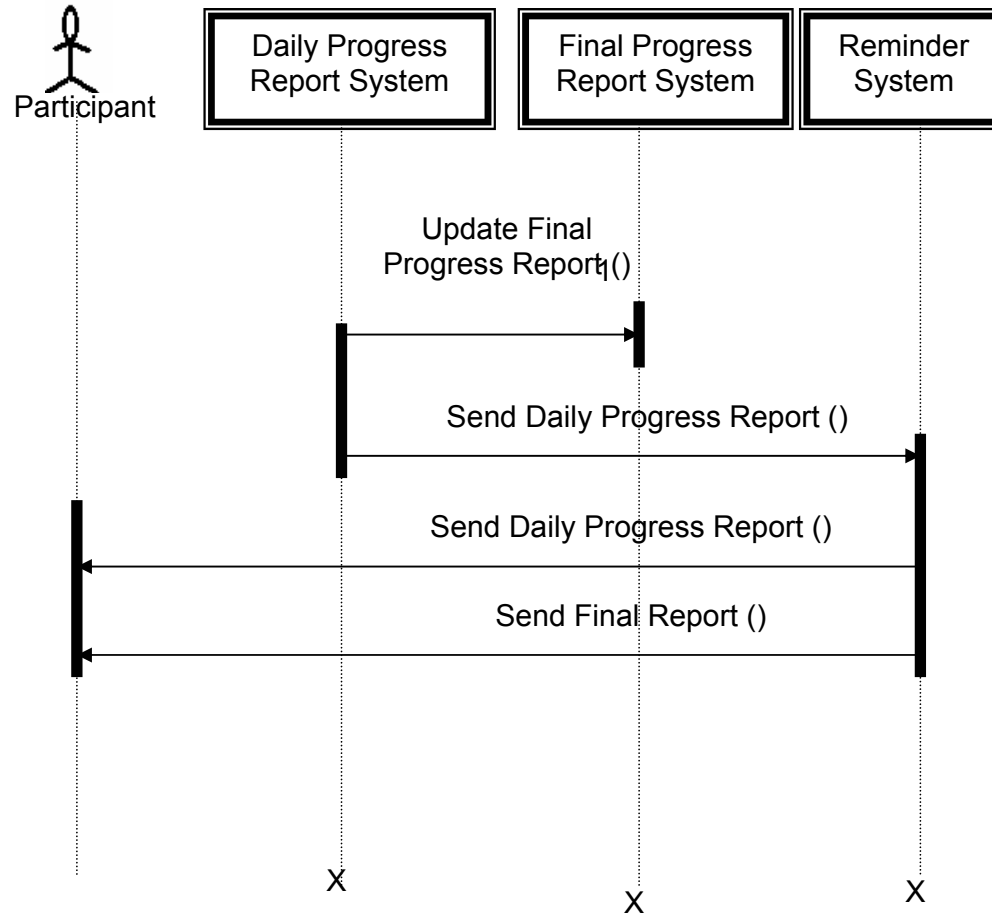


Figure 2.11.5: Sequence diagram for Interactive Participatory Solution to Distance Learning System

2.12. Class Diagram

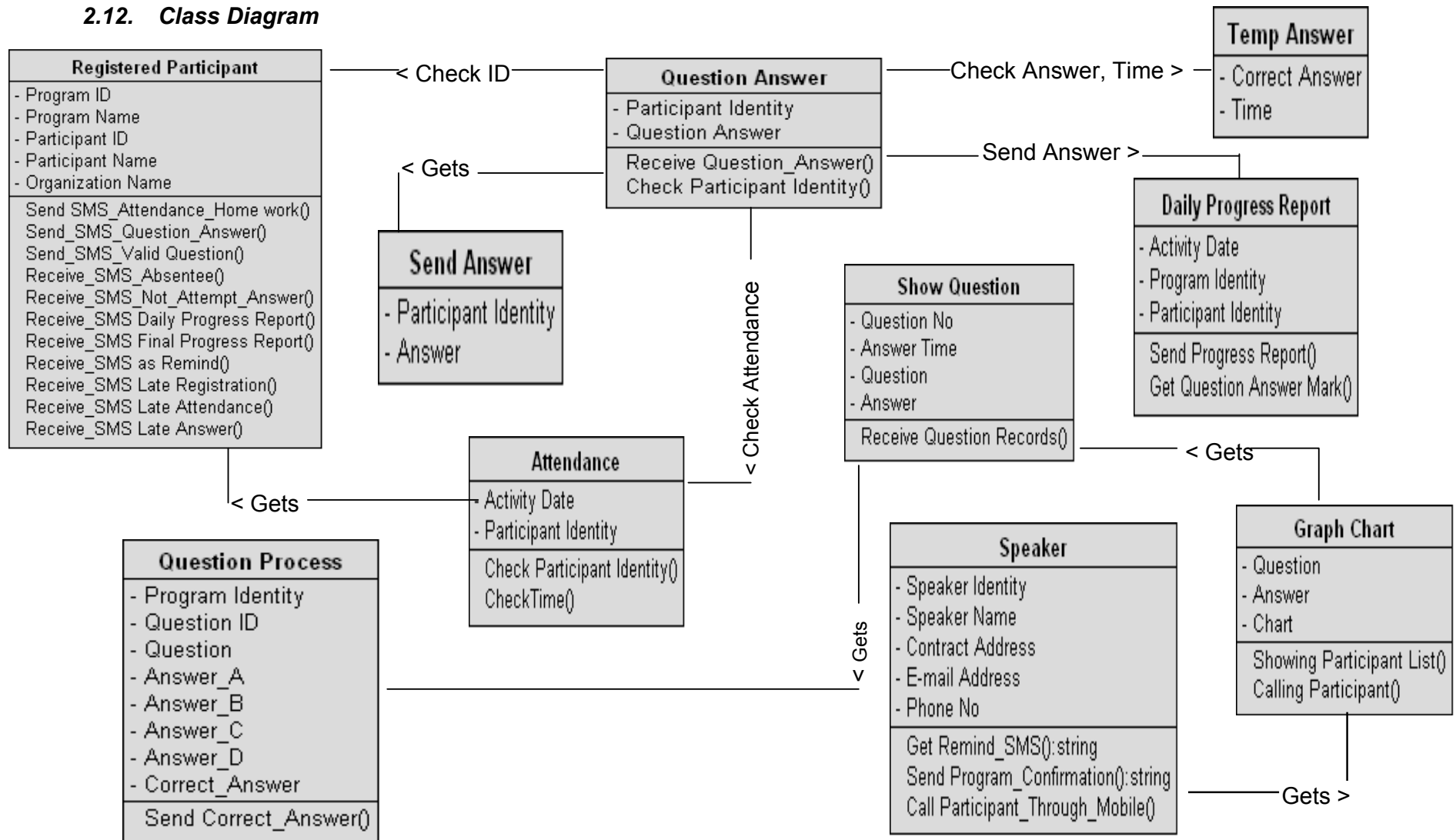


Figure 2.12: Class Diagram for an Interactive Participatory Solution to Distance Learning System of my modules.

CHAPTER III

DESIGN MODEL

3.1. Entity Relationship Diagram

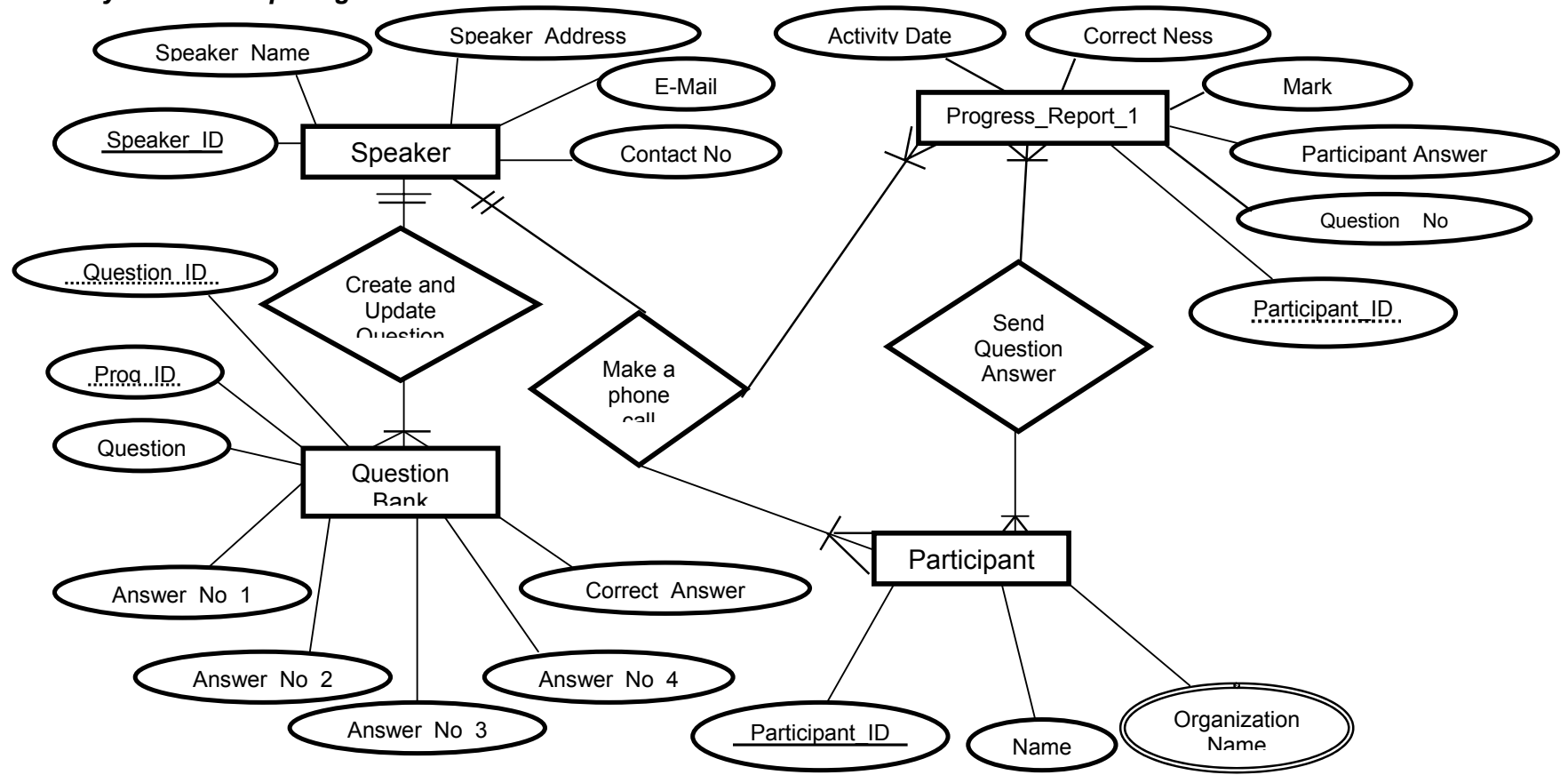


Figure 3.1 Entity Relationship Diagram for an Interactive Participatory Solution to Distance Learning System of my modules.

3.2. Database Design

Tables Design:

Table Name: Question Bank

Purpose: Input of Question with answer and correct answer

Table 3.2.1
Question Bank Entry

Name	Datatype	Size	Scale	Nulls?	Default Value
PROGRAM_ID	VARCHAR2	10			
QUESTION_NO	VARCHAR2	10			
QUESTION	VARCHAR2	300			
CHOICE_NO1	VARCHAR2	200			
CHOICE_NO2	VARCHAR2	200			
CHOICE_NO3	VARCHAR2	200			
CHOICE_NO4	VARCHAR2	200			
CORRECT_ANSWER	VARCHAR2	10			

Description of Question Bank Table:

Question Bank Table contains several questions for several programs. Questions may be created by several presenters. Here Program_ID and Question_No is composite key. The 1NF of Question Bank Table is given below:

QUESTION_BANK (PROGRAM_ID, QUESTION_NO, QUESTION, CHOICE_NO1, CHOICE_NO2, CHOICE_NO3, CHOICE_NO4, CORRECT_ANSWER)

Table Name: Progress_Report_1

Purpose: Keeps Participant Question Answers that are sent by participants through SMS.

Description:

Progress Report_1 Table contains the answers that are sent by the participants through SMS. The 1NF of Progress Report_1 is given below:

PROGRESS_REPORT_1 (ACTIVITY_DATE.....PARTICIPANT_IDENTITY,
QUESTION_NO, PARTICIPANT_ANSWER, MARK, CORRECTNESS)

Table 3.2.2
Progress_Report_1

Name	Datatype	Size	Scale	Nulls?	Default Value
ACTIVITY_DATE	VARCHAR2	15			
PARTICIPANT_IDENTITY	VARCHAR2	13			
QUESTION_NO	VARCHAR2	10			
PARTICIPANT_ANSWER	VARCHAR2	15			
MARK	NUMBER	10	0		
CORRECTNESS	VARCHAR2	10			

Table Name: Temp Answer

Purpose: To store correct answer and valid time for a specific question.

Table 3.2.3
TEMP_ANSWER

Name	Datatype	Size	Scale	Nulls?	Default Value
CORRECT_ANSWER	VARCHAR2	10			
TIME_COUNT	VARCHAR2	10		✓	

Description:

It keeps information of correct answers and given for sending answers, which question is shown on the screen by the presenter. It keeps correct answer to compare with participant's answers. It also keeps time to compare time with participant's answered time. The 1NF of Temp Answer Table is given below:

TEMP_ANSWER (CORRECT_ANSWER, TIME_COUNT)

Table Name: TEMP_GRAPH

Purpose: To store information about graph chart.

Table 3.2.4
TEMP_GRAPH

Name	Datatype	Size	Scale	Nulls?	Default Value
QUESTION_NO	VARCHAR2	10			
PARTICIPANT_IDENTITY	VARCHAR2	13			
PARTICIPANT_ANSWER	VARCHAR2	3			

Description:

To prepare Graph chart all the information are found from this table. It keeps Participant Identity, Question No (that is show on the screen) and answers which are sent by participants through SMS. The 1NF of TEMP_GRAPH Table is given below:

TEMP_GRAPH(QUESTION_NO,PARTICIPANT_IDENTITY,PARTICIPANT_ANSWER)

3.3. User Interface Design

Select Program ID

Display Time

- What do a satellite dish and the mirror of a car headlight have in common?
- Which of the following subjects tells us why we need a parabolic shape for the
- On normal paper that we use, i.e. in a plane, how can we best describe comp
- A formula given in terms of X is sometimes called a function of X or $f(x)$. Whi
- The simplest Parabola is described by the following function
- How can we find out what a particular function of x or $f(x)$ looks like?
- When $f(x) = x^2$, what is the value of $f(x)$ when $x = 3$?
- What is the value of x and $f(x)$ at the lowest points shown on the graph ?

Back to main

All Qs for a delivery are listed below

Figure 3.3.1 Sample form of question Selection.

The figure 3.3.1 shows the bank of questions to be shown to the participants in the class. These questions were selected from question bank of Distance Learning System.

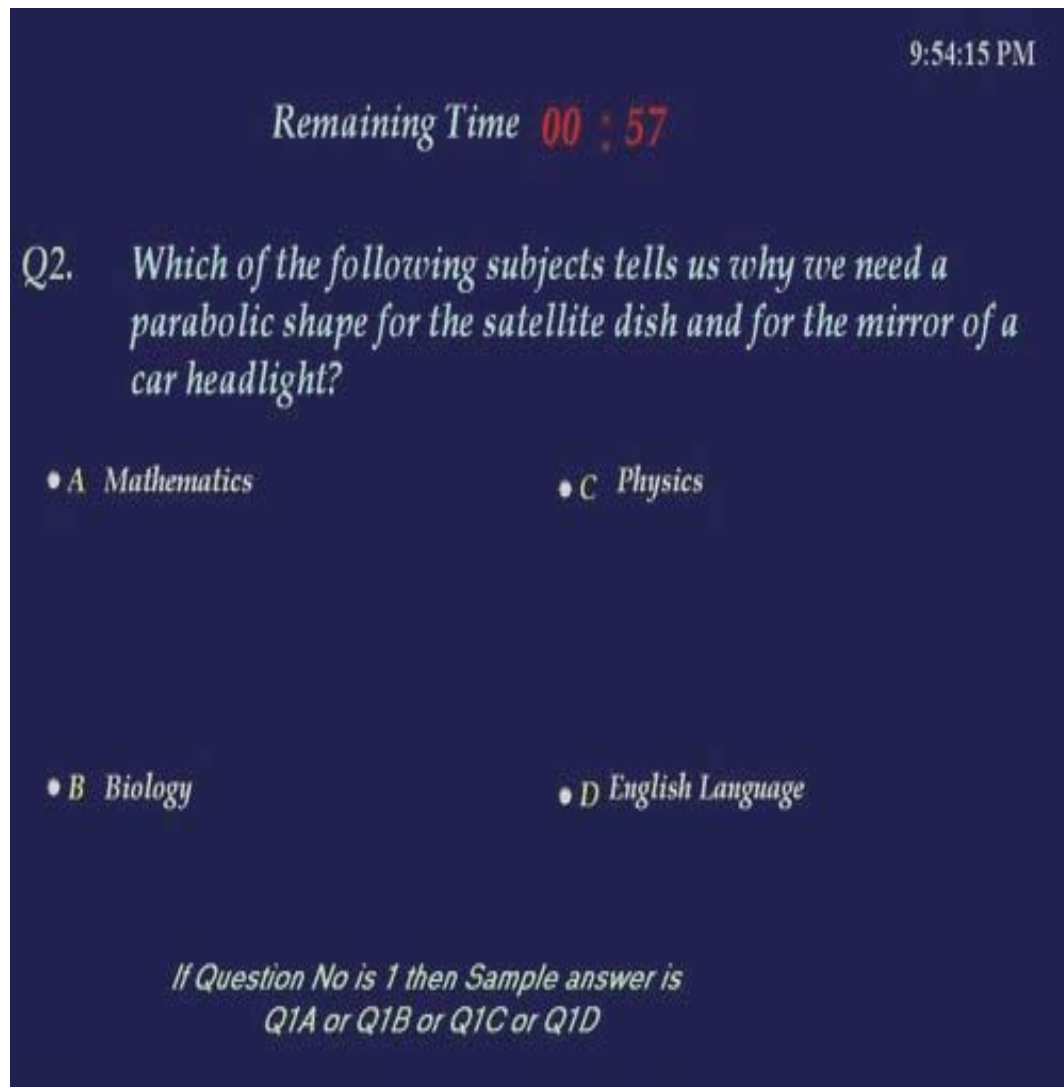


Figure 3.3.2: Selected Question was shown on the screen

The figure 3.3.2 shows a sample question that was shown to the participants with four possible answers and the remaining time for sending answer. It also shows the instruction to the participants for sending answer.

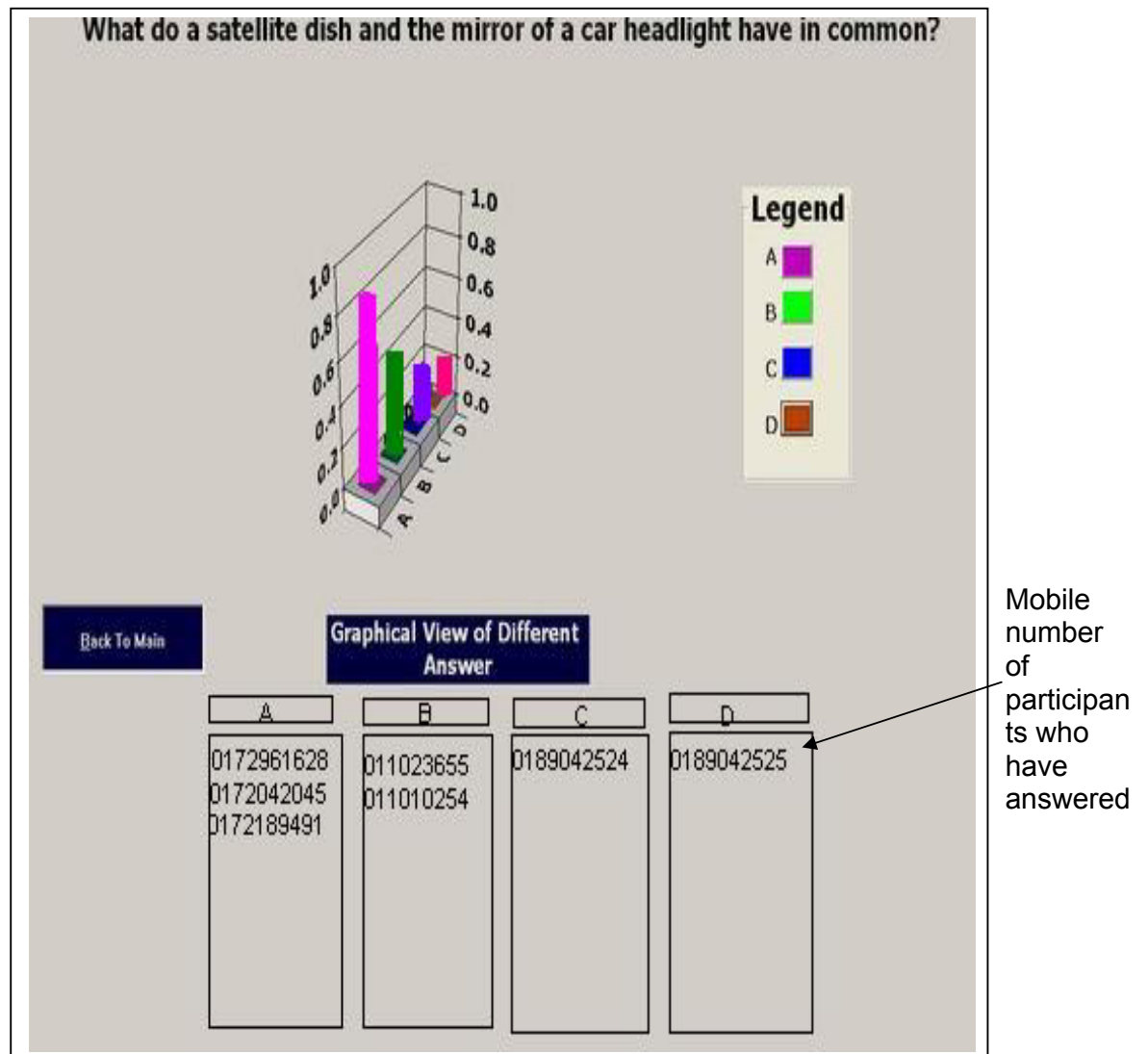


Figure 3.3.3: Answer graph which is viewed by presenter and participants.

The figure 3.3.3 shows a sample graph chart that was created according to the participant's answers. It also shows the list of the participants according to their answer in four different list boxes.

CHAPTER IV

SYSTEM DEVELOPMENT

4.1. Question Answer System

After showing the question on the screen, presenter describes the question and read out the answers. Presenter then gives time (minute's) for answering. Within due time, all answers are received by the question answer system. The question answer system works as follows:

- Answers which is sent by the participants through SMS is stored in Incoming log file.
- Using a parsing function, the participants ID, Question Answer, Keyword Q and question number are parsed.
- Using a function, whether participant ID is registered or not is checked. If participant is not registered then the question answer system sends a SMS that you are not a valid participant.
- If the participant is registered then check participant was present for that day's program by using another function which checks participant attendance. If the participant did send his/her attendance then the question answer system sends a SMS that you were absent for today's program.
- If participant's attendance is found, then check the time for question answer. Another function verifies valid time for question answer. If the time is not valid then the question answer system sends a SMS that you are late to answer.
- If the time is valid then question answer system checks the first character of participant's answer is q (Q) or not. If the first character is not q (Q) then the answer will not accept the answer.

- If the first keyword is q or Q then question answer system checks the last character is A, B, C or D. If the last character is not any of A, B, C or D then it will not accept the answer.
- If the last character is any of A, B, C or D then it check the middle character(s) is/are positive integer. If not positive integer it will accept the answer.
- If the middle character(s) is/are positive integer then it will store the question answer in the Progress_Report_1.
- It will also verify the question answer is correct or not. If the question answer is correct then the participant will get one (1) mark for that question answer otherwise zero (0).

Code Extract of Question Answer System (Parsing Message Function)

```

1.  Public Function GetToken(new_txt As String, delimiter As String)
      As String
2.  Static txt As String
3.  Dim pos As Integer
4.  If new_txt <> "" Then
5.  txt = new_txt
6.  pos = InStr(txt, delimiter)
7.  If pos < 1 Then pos = Len(txt) + 1
8.  GetToken = Left$(txt, pos - 1)
9.  pos = Len(txt) - pos + 1 - Len(delimiter)
10. If pos < 1 Then
11. txt = ""
12. Else
13. txt = Right$(txt, pos)
14. End If
15. End Function

```

4.2. **Graph Chart and Calling System**

Graph chart creates a 3-D graph according to the answers of the participants. The graph chart and calling system works as follows:

- Get the list of the participants answer from Temp Graph table, a function is used to find out the list of the participants as A, B, C, or D. And then create the graph.
- The graph show all participants lists as A, B, C and D. It will separate participants according their answer.
- The lists of the participants are found in four-list box. Each list box contain specific participant list. If we click on the legend A, B, C or D then we can see the participants list.
- From the list, if presenter double clicks on any of the participant ID (Which in this case is the mobile number), then a live conversation can occur between presenter and participant. The computer will automatically dial the selected mobile number.

Code Extract of Graph chart System

```

1.   .RowCount = 1
2.   .ColumnCount = 4
3.   'One record is one data series.
4.   ' Each data series is a collection of columns
5.   'Each data is assigned to a particular row and column with .data
6.   For i = 1 To rs5.RecordCount
7.       If rs5(2) = "A" Then
8.           count_a = count_a + 1
9.           List4.AddItem rs5(1)
10.          cmd_ans_a.Visible = True
11.          ElseIf UCase(rs5(2)) = "B" Then
12.              count_b = count_b + 1
13.              List3.AddItem rs5(1)
14.              cmd_ans_b.Visible = True
15.              ElseIf UCase(rs5(2)) = "C" Then
16.                  count_c = count_c + 1

```

```
17. List2.AddItem rs5(1)
18. cmd_ans_c.Visible = True
19. Elseif UCase(rs5(2)) = "D" Then
20. count_d = count_d + 1
21. List1.AddItem rs5(1)
22. cmd_ans_d.Visible = True
23. End If
24. rs5.MoveNext
25. Next i
26. For Row = 1 To 1
27. For Column = 1 To 4
28. .Column = Column
29. .Row = Row
30. If Column = 1 Then
31. .Data = count_a
32. .ColumnLabel = "A"
33. End If
34. If Column = 2 Then
35. .Data = count_b
36. .ColumnLabel = "B"
37. End If
38. If Column = 3 Then
39. .Data = count_c
40. .ColumnLabel = "C"
41. End If
42. If Column = 4 Then
43. .Data = count_d
44. .ColumnLabel = "D"
45. End If
46. Next Column
47. Next Row
48. End With
49. With MSChart2.Plot
```

```

50. 'To customize the datapoints fillcolors
51. .SeriesCollection.Item(1).DataPoints.Item(-1).Brush.FillColor.Red    =
    200
52. .SeriesCollection.Item(1).DataPoints.Item(-1).Brush.FillColor.Green  =
    50
53. .SeriesCollection.Item(1).DataPoints.Item(-1).Brush.FillColor.Blue   =
    200
54. .SeriesCollection.Item(4).DataPoints.Item(-1).Brush.FillColor.Red    =
    200
55. .SeriesCollection.Item(4).DataPoints.Item(-1).Brush.FillColor.Green  =
    100
56. .SeriesCollection.Item(4).DataPoints.Item(-1).Brush.FillColor.Blue = 56
57. 'To Print the Label Value at the top of the bar of each data
58. .SeriesCollection.Item(1).DataPoints.Item(-
    1).DataPointLabel.LocationType = VtChLabelLocationTypeOutside
59. .SeriesCollection.Item(2).DataPoints.Item(-
    1).DataPointLabel.LocationType = VtChLabelLocationTypeOutside
60. .SeriesCollection.Item(3).DataPoints.Item(-
    1).DataPointLabel.LocationType = VtChLabelLocationTypeOutside
61. .SeriesCollection.Item(4).DataPoints.Item(-
    1).DataPointLabel.LocationType = VtChLabelLocationTypeOutside
62. End With

```

4.3. Show Question and Timing System

The Show Question and Timing system work as follows:

- Presenter selects specific program ID and then selects time for sending answer.
- After question is shown on the screen, then presenter discusses the question and read out the four possible answers.
- The presenter clicks on the start button for starting the timer.

CHAPTER V

TESTING

5.1. *Actual Test*

5.1.1. System and presentation Test

On 16 December, 2004, we tested the system at a coaching center in Dhanmondi. There we arranged a class session to simulate our complete system. We, all four-group members mutually tested the system over there. Our respected advisor conducted a class and recorded the video first. Then we play that video and a group of participants follow that video as they were attending a live class. They were given some mobile phones to interact with the system. Thus we had our system testing and from there we have gathered ideas how organize the sequence of our entire Distance learning classroom system.

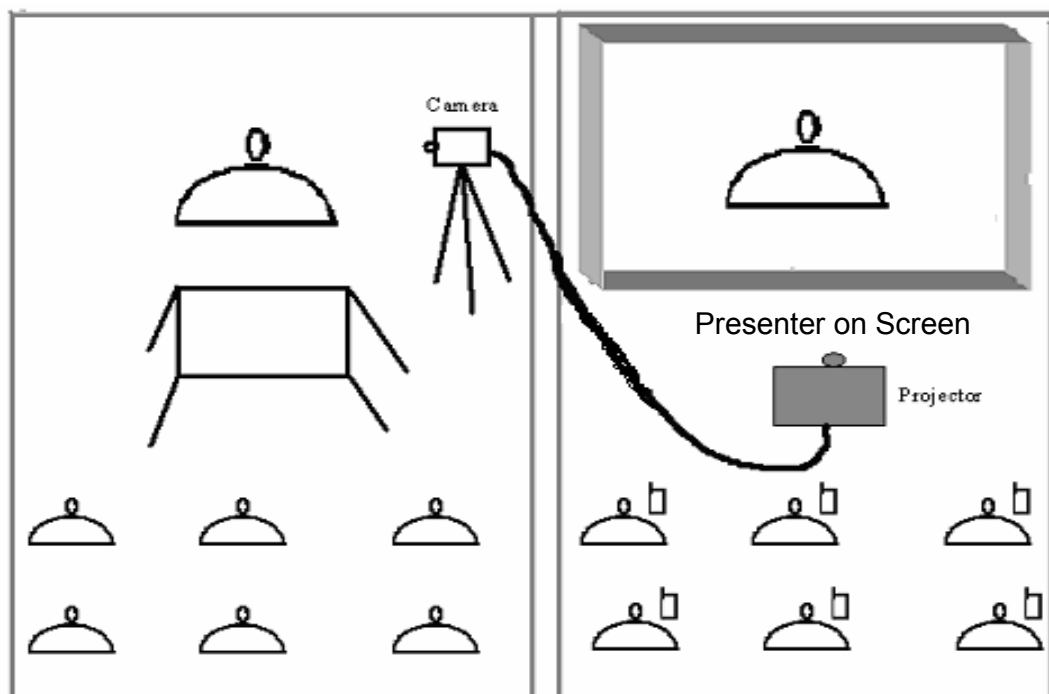


Figure 5.1.1a Group of participants in a face-to-face classroom

Figure 5.1.1b Group of participants in the virtual classroom

5.1.2. Acceptance Test

We have tested our Distance Learning (DL) system at BRAC University Savar residential campus. Students taking the course MAT-101 participated on the test program. We divided the participating students into two groups. Each group had about 20 students. Dr. Yousuf M. Islam took a class on Quadratic functions. One group sat in front of the presenter face to face (a usual face-to-face class situation) and other group sat in the next room each with a mobile set. Students with the mobile set heard the presenter's speech on the sound system and watched him on a projected screen. That day we tested the complete sequence of a 'live class. As the sequence of the learning steps of our system first the students with the mobile set send SMS to know a program then registered for that program. The presenter started the class session at the scheduled time. Within 5 minutes the registered participant gave their attendance. The students send the attendance got the attendance mark processed by our system. After lecturing each topic the presenter displayed questions to the participant. The presenter selected the question and set the time for answering that question from our system. The system processed the answer and also checked the answer. The system alerted the students who did not attempt to answer. It also showed the graph of student's answer and the presenter elected one of the students from the list to talk to him about the answer he answered. At last reminder system delivered the daily progress report at the end of the session to the participants via SMS. The figure 5.1.1.a shows the participants in a face-to-face classroom and the figure 5.1.1.b shows the participants in the virtual classroom.

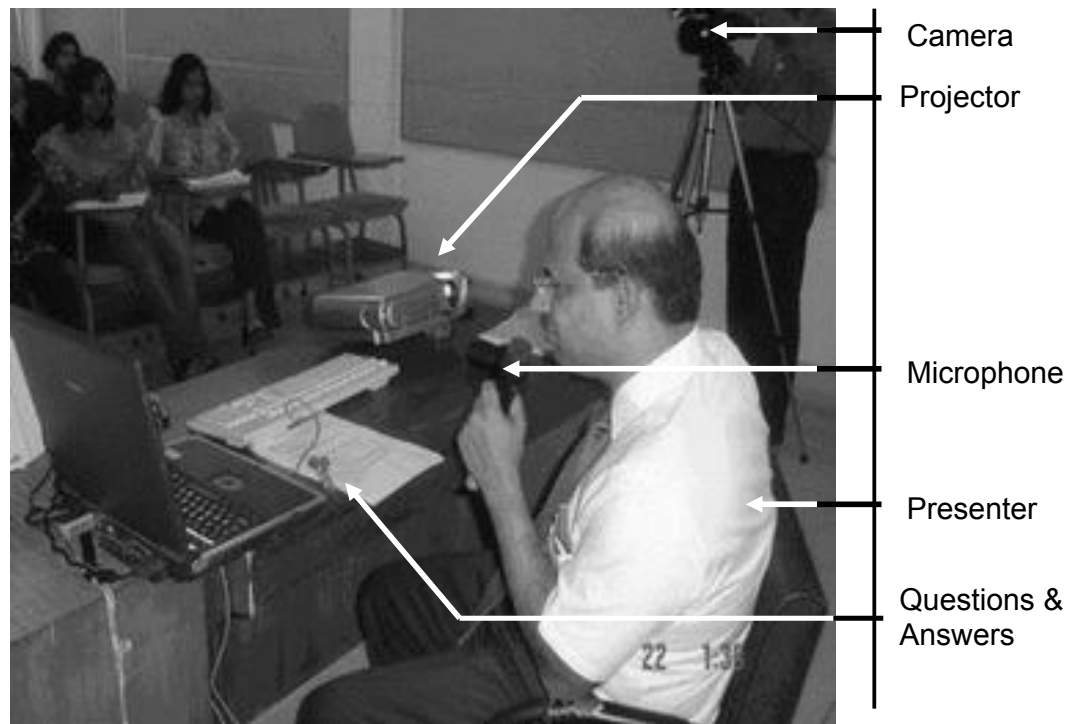


Figure 5.1.2a Presenter delivering his speech to both of the groups



Figure 5.1.2b Face to face participants are in the class

The figure 5.1.2a shows the presenter delivering his speech in the face-to-face classroom and this speech was broadcast to other classroom through a camera. Figure 5.1.2b shows the group of participants who joined the face-to-face classroom. The participant can see and listen to the presenter directly face to face (usual class room situation). They can ask questions directly to the presenter.



Figures 5.1.2c Face to face participants are writing class notes and the answers to question on paper.

The figure 5.1.2c shows the group of participants who joined the class in a face-to-face classroom. The participants are taking class notes and writing down the questions answers that are shown in the class. The presenter had no way of monitoring whether they are actually answering the questions.

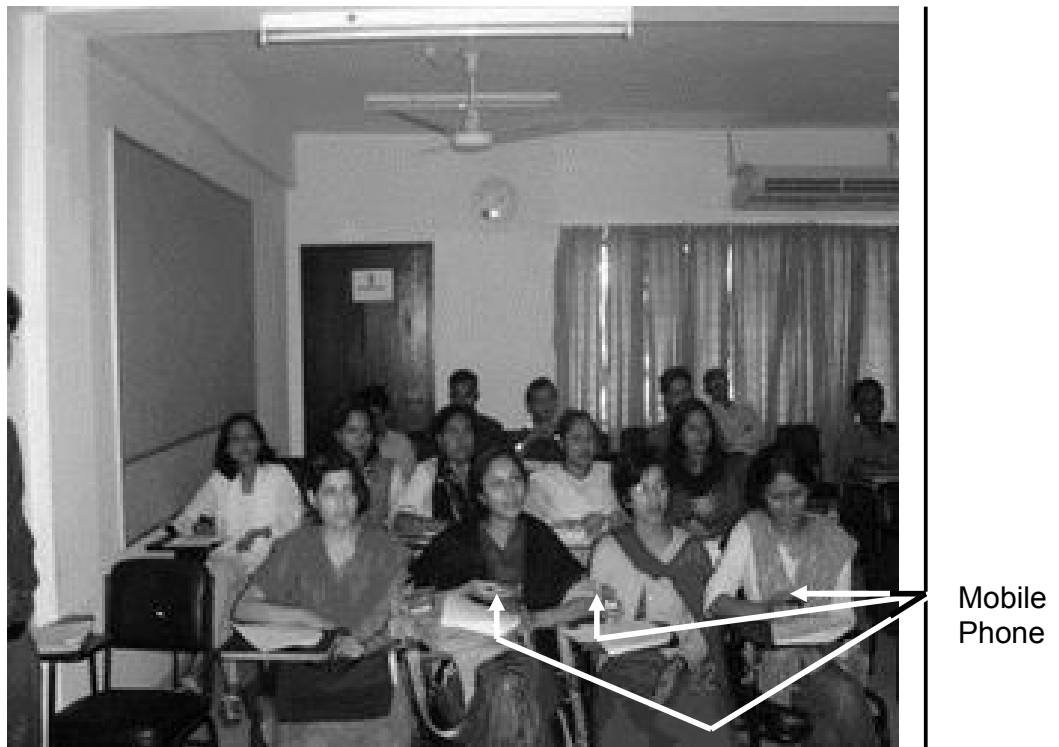


Figure 5.1.2d Mobile-User participants are in the class in the other room.

The figure 5.1.2d shows the group of participants who joined the class through Mobile phones. They are in other classroom (distance learning class room).

The figure 5.1.2e shows the projector screen on which the students see the presenter, power point displays and the questions. Our Moderator Mr. Zillur Rahman and one of the team member's Shoeb Ahmed are observing the class.

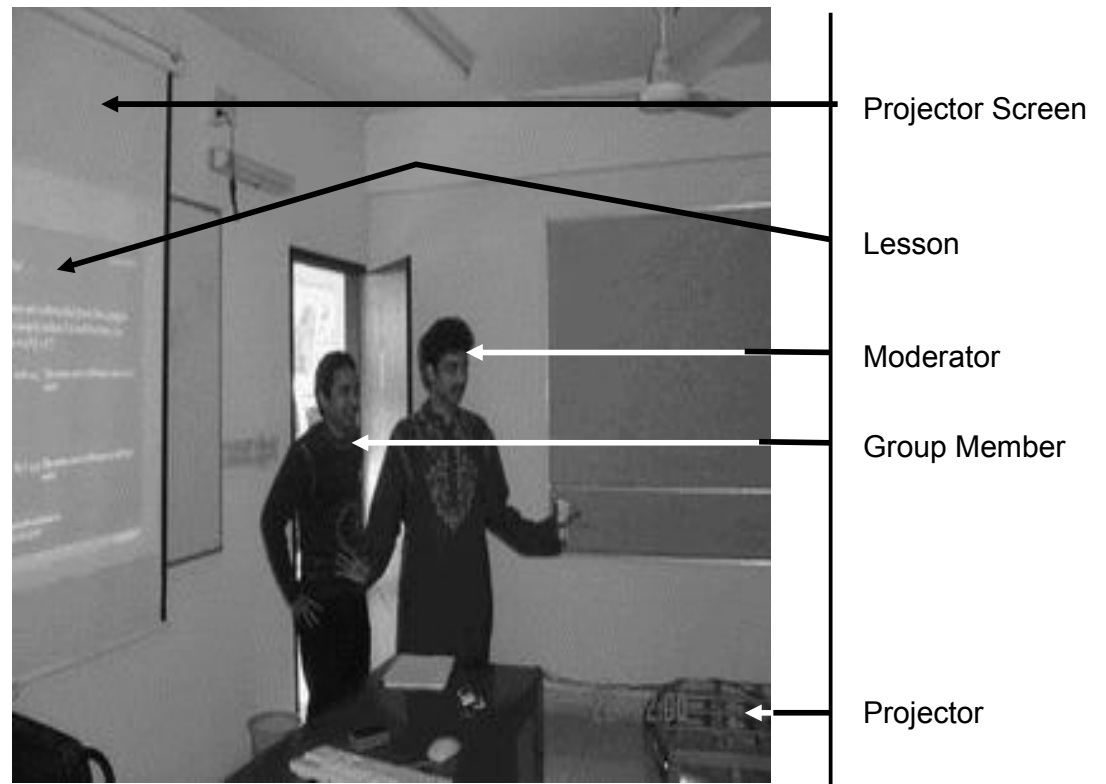


Figure 5.1.2e Projector screen for distance learners (Television Screen).

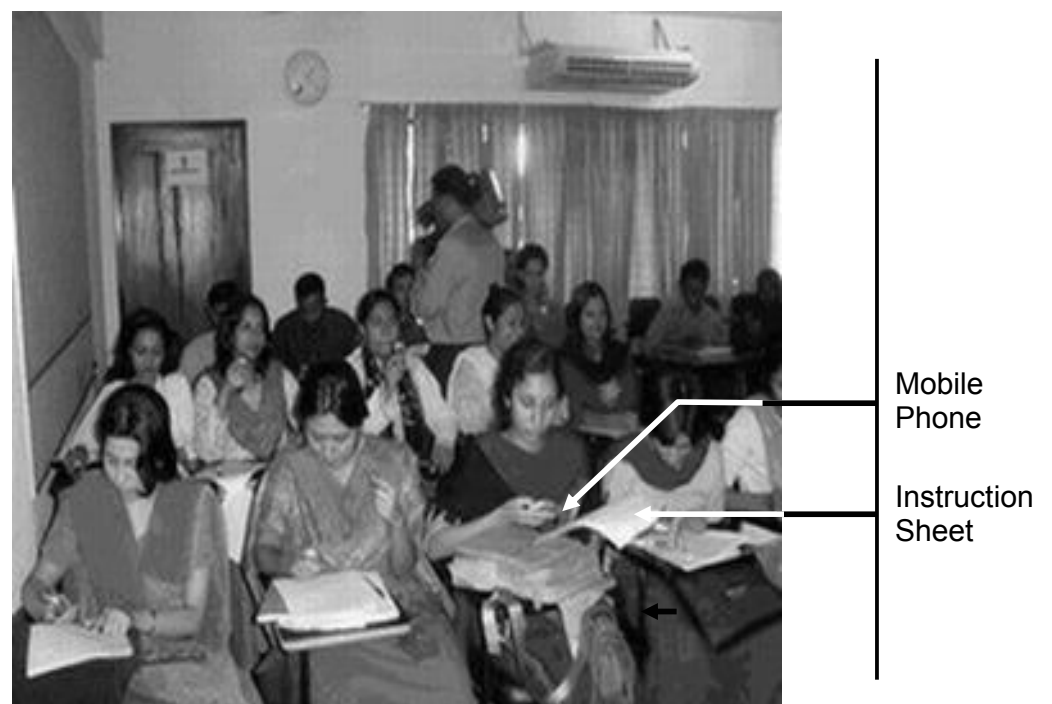


Figure 5.1.2f Mobile user participants are sending their answers via SMS

The figure 5.1.2f shows participants sending answers through SMS. They have an instruction sheet [For details refer to Appendix] on how to send answers.



Figure 5.1.2g Presenter talking to participant in DL classroom

Using our proposed system, presenter interacts directly with participant real time through mobile phone. Computer randomly selects a participant from the participant lists found from the Graph chart system and then asks the participant the reason for choosing an answer. The Figure 5.1.2f shows the real time conversation between presenter and a participant.



Figure 5.1.2h One of our group members administrates our system.

5.2. Test data

The live system was tested using following data:

Program Information:

At the beginning of the class at savar campus we inputted the program ID, program name and organization name in program in program information table.

PROGRAM_ID	PROGRAM_NAME	ORGANIZATION_NAME
PROG1	Quadratic Function	BRAC University

Program Details:

And then we inputted the starting date, ending date, program duration and number of the participants for joining this program.

PROGRAM ID	START DATE	END DATE	PROGRAM DURATION	NO. OF PARTICIPANT
PROG1	22-Dec-2004	22-Dec 2004	1	25

Presenter Profile:

The following data were inputted into the Presenter table to keep the information about presenter.

Presenter ID	Presenter Name	Presenter Address	Presenter E-mail	Presenter Contact No
SP1	Dr. Yousuf M. Islam	Gulshan - 2	yislam@bracuniversity.net	9881265, EXT-434

Program Schedule:

The following data were inputted into the program schedule table to confirm the program.

PROGRAM ID	ACTIVITY DATE	PROGRAM CONFIRMATION	SPEAKER ID	SPEAKER CONFIRMATION	PROGRAM START TIME	PROGRAM END TIME
PROG1	12/22/2004	Yes	SP1	Yes	13:29:00	14:10:00

List of registered participants:

The following table contains the registered participant list as their registration message (SMS). The list of the messages are added to the Appendix

PARTICIPANT_IDENTITY	PARTICIPANT_NAME	ORGANIZATION_NAME
+880172844972	UMMAY HUMAYRA	BRAC University
+880172720366	TAHIA KHAIR	BRAC University
+880176412311	SHAMIUL ISLAM	BRAC University
+880172849812	SHAHIDA CHOWDHURY	BRAC University
+880171288829	TONIMA AZAM	BRAC University
+880176835595	NAZIFA TASNIM	BRAC University
+880172105137	ZAHID ISLAM	BRAC University
+880172696308	ISHFAQ	BRAC University
+880172832211	SHORAB	BRAC University
+880176552088	RIDWANA E REJINA	BRAC University
+880189405131	SAJJAD AHMED	BRAC University
+880172977503	EVANA	BRAC University
+880189502590	MD KAMRUZZAMAN	BRAC University
+880171876909	MD ISHRAT JAMIL	BRAC University
+880172823901	KHAIRUL BASAR	BRAC University
+880189419681	RUBAMA AHMED NIRU	BRAC University
+880172230474	FATEMA AKTER SUMI	BRAC University
+880173013365	MITU	BRAC University
+880176593790	ISHTIAQ	BRAC University
+880172798525	AMITABH	BRAC University
+880176484892	SHAMIMA SIDDIQUA	BRAC University

CHAPTER VI

DISCUSSION AND CONCLUSION

6.1. *Performance Testing*

For system testing we tested the performance of the entire system with actual classroom data. Performance testing determines how the system performs on the range of possible environments in which it may be used. For testing whether the proposed distance learning system was effective we took a pre-test and post-test for both the face-to-face and the Distance Learning class. A T-test [For details refer to Appendix] was used to compare the results both systems of teaching.

6.2. *Results*

At the beginning of the program we arranged a test (pre-test) for both of the face-to-face and mobile user participants. We tested them on 6 questions. We also divided them as Bangla medium and English medium participants. After end of the program we also arranged another test (post-test) for both of them using the same questions. And then we evaluated their tests. The following table contains the evaluation sheet of pre-test and post-test.

Table 6.2
Evaluation Sheet of Pre-test and Post-test.

Interactive Distance Education Using SMS Evaluation Research						
		Marks out of 6	Eng Med	Bang Med	Eng Med	Bang Med
Section 1			Face to Face		Face to Face	
Sl #	Student	Name	Pre-test		Post-test	

	ID				
1	04304067	Md. Showkat Ali		1	4
2	04303008	Jhumoor		0	3
3	04303004	Nazma Akter		0	5
4	04304010	Md. Zakir Hossain		1	3
5	04304025	Istiak Ahmed		0	2.5
6	04304088	Nusrat Farzana		1	4.25
7	04304087	Sumayla Nahrin		0	4.25
8	04304097	Md. Moniruzzaman		1.5	4
9	04304099	Khorshed Alam		1.5	2
10	04304038	Faria Rafiq		0	3
11	04304034	Zahid		1	3
12	04304089	Tahsin Rahman		0	2.5
13	04304043	Md. Arif Hossain		0	2
14	04304064	Md. Anamul Hasan		1	3
15	04303005	Nadia Saleh		2	4.25
16	04304047	Faria Afsana		1	3
17	04305003	Nusrat Nadia		1	3
18	04304048	Rajib Kumar Cahda		2	1
19	04304029	Shamir		1	4.5
20	04304052	Md. Imran Khan		1	5
			SMS		SMS
Section 2			Pre-test		Post-test
1	04304030	Rubana Ahmed Niru		1	5
2	04304066	Md. Shamiul Islam			
3	04304040	Shoeb Ahmed			
4	04304045	Nahid Raja Tina		1	1
5	04303003	Tonima Azam		0	4

6	04304014	Fatema Akter Sumi		0		5
7	04304020	Shumaisa Tameem		0		5
8	04303002	Nazifa Tamim		0		5.5
9	04309003	Ummay Humayra Rumana		0		5.5
10	04302049	Shamima Siddiqua		0		5.5
11	04304073	Ishrat Jamil		1		3
12	04303001	Tahia Khair	1.5		5.5	
13	04303006	Shahida Chowdhury		1		5.5
14	04309002	S.M. Kamrul Bahar		0		3
15	04305002	Sajjad Ahmed		1.5		3.25
16	04304016	Israt Jahan		1		5
17	04304081	Mehboob Hafiz		1		5
18	04304021	Md. Kamruzzaman		0		5
40	04304056	Md. Shorab Hossain		0		5
19	04304051	Ridwana-E-Rejina		1		3
20	04304017	Ishtiaque Ahmed Mallick		0		1

Pre-test:

➤ Face-to-face

We consider a total mark is 6. On face-to-face Pre test there is no English medium participant. Seven people do not get any mark. Out of 6 the average mark is 0.8.

➤ Distance Learning group

We consider a total mark is 6. Ten people did not get any mark. Out of 6 the average mark is 0.5

Post-test:

➤ Face-to-Face

We consider a total mark is 6. On face-to-face Pre test there were no English medium participant. At post-test their performance is better than pre-test. Out of 6 the average mark is 3.24.

➤ Distance Learning group

We consider a total mark is 6. Out of 6 the height mark is 5.5 and average mark is 3.60.

6.3. Comparison

From the upper discussion we found that the Distance Learning group participant's performance is marginally better than face-to-face test. The average mark at face-to-face is 3.24 and using the proposed Distance Learning system the average is 3.60. The ratio of performance is SMS/Face-to-face= $3.60/3.24=1.11$. Finally the performance of using our proposed DL system $\geq$ face-to face (traditional) system. A T-test analysis is added to the Appendix.

6.4. Problems Encountered

During the development the Distance Learning System we have faced the following problems:

- The arrangement of a suitable place was difficult for us.
- The testing of the system has taken place at Savar, so we had to arrange several equipments that are rent were costly.
- To arrange a few numbers of mobile phones were difficult.

6.5. Limitations

Our proposed system has the following limitations:

- One of the modules of our system is summary question system. But because of time limitation it was not possible to us to make the summary question system perfectly. But we did some of the portion of the summary question system.
- It needs better mobile network service.
- The system will work for GSM Mobile phone system only.

6.6. *Future Modification*

For the summary question process the system should cluster questions from a large number of participants.

6.7. *Conclusion*

The primary role of the student is to learn. However, monitoring of the learning process during the progress of a class is difficult. So by establishing a Virtual Interactive Class room /Meeting we can provide a better monitoring for a large number of students of our country. So our project focus to establish a Virtual class room for students to get proper education from qualified and experience teacher. It will also help participants to increase their concentration and participate in the classroom attentively.

From our research we found that the results of the Distance Learning (DL) participants are at least the same as face-to-face participants. At the beginning of the test (pre-test) we found that the face-to-face participant's average mark was 0.8 out of 6 and the DL groups average mark was 0.5. After taking the post-test at the end of the live test the face-to-face participant's average mark was 3.24 and on other hand the DL group's average mark was 3.6 out of 6. So we can say that for a certain cost a large number of participants can get the opportunity for better education from qualified and experience presenter (teacher). The participants do not need to come to a on campus classroom; they can attend this class from their home or rural village. So our proposed DL system will save more time and expenditure for the participants.

Finally, due to availability and access of modern technology, TV DL can take advantage of the concepts tested in the thesis.

LIST OF REFERENCES

LIST OR REFERENCES

- [1]. Development of Education National Report of Bangladesh
Education Ministry, September 2004.
- [2]. Mobile Telephone technology as a distance learning tool, (to be published), Yousuf M. Islam, PhD, Mawdudur Rahman, PhD and Mr. Manzur Ashraf.
- [3]. Barriers to Development in Open Learning and Distance Education: Bangladesh
Mostafa Azad Kamal
Assistant Professor, Bangladesh Open University
Sadia Afroze Sultana
Lecturer, Bangladesh Open University
- [4]. Bangladesh Case Study-Report commissioned by the Commonwealth of Learning and UNESCO
Professor Robin Middlehurst and Steve Woodfield
Centre for Policy and Change in Tertiary Education, University of Surrey, United Kingdom.
- [5]. Multidimensional assessment of online learning –A pilot study.
Mawdudur Rahman, Nishikant Sonwalkar.
- [6]. Delivery Technologies used for Distance Education in Bangladesh
Open University
Mohammod Shamim Hossain
School of Science and Technology
Bangladesh Open University
Board Bazar, Gazipur-1705, Bangladesh.
Abdulmotaleb El Saddik²
Multimedia Communication Research Laboratory
University Of Ottawa
Ottawa, Ontario K1N 6N5, Canada.

- [7]. Strategies for Developing Bangladesh Information Infrastructure
Aziz Ahmad, Director, R&D and Service Provider solutions, ThruPoint,
auahmad@aol.com
- [8]. An Interactive Videoconference Distance Learning Biostatistics Course
Guang-Hwa Andy Chang
Department of Mathematics and Statistics, Youngstown State
University.
One University Plaza, Youngstown, OH 44555, U.S.A.
E-mail: gchang@ysu.edu
- [9]. Overview of Internet Access in Bangladesh: Impact, Barriers, and
Solutions
Abul Kalam Azad <akazad@medinet.agni.com>
Dhaka Medical College Bangladesh
Nazrul Islam nazrul@medinet.agni.com
United Nations World Food Program Bangladesh
- [10]. The Bangladesh Open University: Mission and Promise
M. Shamsheer Ali, A. K. Enamul Haque and Greville Rumble
- [11]. Bangladesh Case Study-Report commissioned by the Commonwealth
of Learning and UNESCO, 2004
Professor Robin Middlehurst and Steve Woodfield
Centre for Policy and Change in Tertiary Education, University of
Surrey, United Kingdom
- [12]. Simulated Computer-Mediated/Video-Interactive Distance Learning: A
Test of Motivation, Interaction Satisfaction, Delivery, and Learning &
Perceived Effectiveness.
Ruth M. Guzley and Susan Avanzino
Department of Communication Arts and Sciences California State
University, Chico
- [13]. Aaron Bor
Department of Communication Design California State University,
Chico
- [14]. Modern system Analysis & Design
Jeffrey A. Hoffer,Joey F. George

Pearson Education Asia.

- [15]. System Analysis and Design
Alan Dennis, Indiana University.
Barbara Haley Wixom, University of Virginia
David Tegarden, Virginia Tech.

URL:

- [1]. <http://www.uwex.edu/disted/definition.html>
[2]. <http://www.citechco.net/bou/>
[3]. www.Citycell.com
[4]. <http://stanford-online.stanford.edu/>
[5]. <http://scpd.stanford.edu/scpd/students/onlineClass.htm>
[6]. <http://www.evl.uic.edu/cavern/vrserver.htm>
[7]. <http://www.col.org/pcf2/papers/sultana.pdf>

APPENDICES

A. USER INSTRUCTIONS FOR DISTANCE LEARNERS

Program Information System:

This module keeps program information. If a participant wants to know about any particular program, he/she has to send a SMS as like:

info<dot> Program id (Not Case Sensitive but no space)

Info.prog1	0171442013
SMS Message	Destination number

The return message gives the particular program information.

Participant Registration System

Participant has to complete his/her registration before the start of a program. The Participant has to send his/her details with program id. The SMS format is:

Reg<dot>program id<dot>Participant name<dot>Organization name

Reg.prog4.Abdul Karim.BRAC	0171442013
SMS Message	Destination number

Note that, here a participant can give space between his/her first and last name. But except that no space is allowed.

Attendance system:

The attendance system takes individual participant's attendance. When a session start the Participant has to send a SMS within next 10 minutes. The SMS format for attendance as:

Attn(Not case Sensitive but no space)

attn	0171442013
SMS Message	Destination number

If there is any home task the SMS format is:

Attn.h1a

Attn.h1a	0171442013
SMS Message	Destination number

Then the attendance system will reply a confirmation message as "BRAVO you are the attentive participants in the class".

Show Question system:

The speaker can throw question on screen to test the participants. He/she just select question from question bank and set time (in minute) for that question. On that time participant send his/her answer through SMS. Like for question one and answer is a. then the SMS format is

q1a	0171442013
SMS Message	Destination number

B. QUESTION BANK

The following questions were asked during the class on Quadratic Functions.

Q1. What do a satellite dish and the mirror of a car headlight have in common?

- a. They are circular in shape.
- b. They are parabolic in shape.
- c. They have a square cross-section.
- d. Their shape is unknown

Answer: Q1b

Q2. Which of the following subjects tells us why we need a parabolic shape for the satellite dish and for the mirror of a car headlight?

- a. Mathematics
- b. Biology
- c. Physics
- d. English Language

Answer: Q2C

Q3. On normal paper that we use, i.e. in a plane, how can we best describe complete curved lines or shapes?

- a. By using a series of X, Y coordinates
- b. By drawing a curved line
- c. Using X and Y axis
- d. By describing the curved line verbally

Answer: Q3A

Q4. A formula given in terms of X is sometimes called a function of X or $f(x)$.

Which of the following function does not describe a curved line?

- a. $f(x) = x^3 + x^2 + 2x + 1$
- b. $f(x) = x^2 + 2x + 1$
- c. $f(x) = x$

d. $f(x) = x^2 + 1$

Answer: Q4C

Q5. The simplest Parabola is described by the following function

a. $f(x) = x^2 + 2x + 1$

b. $f(x) = x^2$

c. $f(x) = 4x^2 + x + 3$

d. $f(x) = 2x + 1$

Answer: Q5B

Q6. How can we find out what a particular function of x or $f(x)$ looks like?

a. By estimating or approximating the curve

b. By plotting the x and y axis

c. By working out the minimum and maximum value of $f(x)$

d. By working out the value of $f(x)$ for a range of x values and plotting the x and corresponding $f(x)$ values

Answer: Q6D

Q7. When $f(x) = x^2$, what is the value of $f(x)$ when $x = 3$?

a. 4

b. 9

c. 6.25

d. 2.25

Answer: Q7B

Q8. What is the value of x and $f(x)$ at the lowest points shown on the graph?

a. -1, 1 and 1, 1

b. -0.5, 0.25 and 0.5, 0.25

c. -0.25, 0.25 and 0.25, 0.25

d. None of the above

Answer: Q8B

Q9: What is the minimum value of the simplest parabola?

a. 3

b. 0

c. -3

d. 0.5

Answer: Q9B

Q10. What would happen terms are subtracted from the simple function $f(x) = x^2$, for example when 3 is subtracted, i.e. when the function is $f(x) = x^2 - 3$?

- a. The entire curve will move up by 3 units
- b. The entire curve will move to right by 3 units
- c. The entire curve will move down by 3 units
- d. The entire curve will move to left by 3 units

Answer: Q10C

Q11. When the coefficient $a=-1$, each value of x^2 will be multiplied by -1. The resulting curve will:

- a. Move down by -1 and have a minimum at $f(x) = -1$.
- b. Be a mirror image of $f(x) = x^2$ around the x-axis with a maximum value at $f(x) = 0$.
- c. Shift to the left by -1 and have a minimum at $f(x) = 0$.
- d. Shift to the right by 1 and have a minimum at $f(x) = 0$.

Answer: Q11A

Q12. When the coefficient $|a| > 1$, x^2 would increase for each value of x , therefore the curve

- a. Will be sharper with the max / min still at $f(x) = 0$.
- b. Will move up by the value of "a" and the minimum at $f(x) = a$.
- c. Will move down by the value of "a" and the minimum at $f(x) = a$.
- d. Will invert and have a maximum value at $f(x) = a$.

Answer: Q12B

C. T-TEST ANALYSIS

We test the hypothesis that “there is no true difference between the two means” (NULL hypothesis). We have used MATLAB as the test-tool through the following command:

```
[h, significance, ci] = ttest2(x,y,alpha)
```

Here the '**alpha**' is related to the degree of certainty we require in order to reject the null hypothesis in favor of the alternative. Using this we decide in advance to reject the null hypothesis if the probability of observing your sampled result is less than the significance level. For a typical significance level of 5%, the notation is $\alpha = 0.05$. For this significance level, the probability of incorrectly rejecting the null hypothesis when it is actually true is 5%. If we need more protection from this error, and then choose a lower value of alpha.

The '**significance**' (**p-value**) is the probability of observing the given sample result under the assumption that the null hypothesis is true. If the significance (p-value) is less than alpha, then we reject the null hypothesis.

PRE TEST:

```
» x=load ('preface2face.txt');
» y=load ('presms.txt');
» mean(x)-mean(y)
ans = 0.2737
» [h, significance, ci] =ttest2(x, y, 0.05)
h =0
Significance = 0.1870
ci = -0.1387 0.6861
```

The result, $h = 0$, means that we cannot reject the null hypothesis. The significance is 0.1870, which means that by chance we would have observed values of t more extreme than the one in this example in 1870

of 10,000 similar experiments! A 95% confidence interval on the mean is $[-0.1387, 0.6861]$, which includes the theoretical (and hypothesized) difference of 0.1870.

POST TEST:

```
» x=load ('face2face.txt');
» y=load ('sms.txt');
» [h, significance, ci]=ttest2(x,y,0.01)
h = 0
Significance = 0.0274
ci = -2.0463    0.1713 ..... (0)
» [h, significance, ci] =ttest2(x, y, 0.02)
h = 0
Significance = 0.0274
ci = -1.9303    0.0553 ..... (1)
» [h, significance, ci]=ttest2(x,y,0.03)
h = 1
Significance = 0.0274
ci = -1.8591   -0.0159 ..... (2)
» [h, significance, ci] =ttest2(x, y, 0.05)
h = 1
Significance = 0.0274
ci = -1.7649   -0.1101 ..... (3)
```

From (0) & (1) where 'alpha' = 0.02, the result, $h = 0$, means that we cannot reject the null hypothesis. The significance is 0.0274, which means that by chance we would have observed values of t more extreme than the one in this example in only 274 of 10,000 similar experiments! From (1) a 95% confidence interval on the mean is $[-1.9303, 0.0553]$, which includes the theoretical (and hypothesized) difference of -0.9375. From (2) & (3) where 'alpha' = 0.03 or more, the result, $h = 1$, means that we can reject the null hypothesis. The significance is 0.0274, which means that by chance we would have observed values of t more extreme than the one in this example in only 274 of 10,000 similar experiments! In (3), a 95% confidence interval on the

mean is $[-1.7649, -0.1101]$, which includes the theoretical (and hypothesized) difference of -0.9375 .

D. INCOMING MESSAGE LOG

The following table contains the incoming messages, which are sent by the participants. The shaded messages shown are from the modules that were developed by me.

Mobile Number	Date	Time	Message
+880171442013	22/12/04	01:27:54	info.prog1
+880188042525	22/12/04	01:30:10	Info.prog1
+880171442013	22/12/04	01:31:27	info.prog1
+880172961628	22/12/04	01:35:50	Reg.prog1.k.i
+880171442013	22/12/04	01:36:01	reg.proG1.ZAMAN.BU
+880172961628	22/12/04	01:43:44	Attn
+880171442013	22/12/04	01:43:48	attn
+880188042524	22/12/04	12:20:20	info.prog1
+880172105137	22/12/04	12:54:37	info.prog1
+880172961628	22/12/04	13:15:58	Info.prog1
+880172844972	22/12/04	13:16:23	Reg.prog1. Ummay humayra.BRAC
+880172720366	22/12/04	13:16:24	Reg.prog1.Tahia khair.BRAC
+880176412311	22/12/04	13:16:54	Reg.prog1.Shamiul Islam.BRAC
+880172849812	22/12/04	13:16:55	Reg.prog1.shahida chowdhury.brac
+880171288829	22/12/04	13:16:58	Reg.Prog1.Tonima azam.Brac
+880176835595	22/12/04	13:17:03	Reg.prog1.Nazifa Tasnim.BRAC
+880172105137	22/12/04	13:17:32	Reg.prog1.ZAHID ISLAM.BRAC

+880172696308	22/12/04	13:17:38	Reg.Prog1.Ishfaq.BRAC
+880172832211	22/12/04	13:18:12	Reg.prog1.shorab.BRAC
+880172230474	22/12/04	13:18:33	Reg.prog.Fatema Akter Sumi.BRAC
+880176552088	22/12/04	13:18:54	Reg.prog1.RIDWANA E REJINA.BRAC
+880189405131	22/12/04	13:17:59	Reg.Prog1.Sajjad Ahmed.BRAC
+880172977503	22/12/04	13:19:03	Reg.prog1.evana.BRAC
+880189502590	22/12/04	13:18:18	REG.PROG1.MD KAMRUZZAMAN.BRAC
+880171876909	22/12/04	13:19:22	Reg.prog1.Md Ishrat jamil.BRAC
+880172823901	22/12/04	13:19:27	Reg.prog1.khairul basar.BRAC
+880189419681	22/12/04	13:18:51	Reg.prog1.rubama ahmed niru.brac
+880172230474	22/12/04	13:20:08	Reg.prog1.Fatema Akter Sumi.BRAC
+880171876909	22/12/04	13:20:29	Reg.prog1
+880173013365	22/12/04	13:20:56	Reg.Prog1.Mitu
+880176412311	22/12/04	13:22:39	attn
+880172105137	22/12/04	13:22:45	attn
+880172849812	22/12/04	13:22:55	Attn
+880176552088	22/12/04	13:22:57	attn
+880171876909	22/12/04	13:23:20	Attn
+880172230474	22/12/04	13:23:30	attn
+880173013365	22/12/04	13:23:46	Attn
+880172977503	22/12/04	13:23:46	attn.h1a
+880172696308	22/12/04	13:23:49	Attn
+880172832211	22/12/04	13:23:55	attn
+880172823901	22/12/04	13:23:59	Attn
+880176835595	22/12/04	13:24:12	attn
+880176593790	22/12/04	13:25:33	Reg.prog1.ishtiaq.brac
+880172720366	22/12/04	13:26:25	attn

+880172696308	22/12/04	13:26:26	Attn
+880172844972	22/12/04	13:26:31	Attn
+880171876909	22/12/04	13:26:38	Attn
+880176552088	22/12/04	13:26:41	attn
+880176412311	22/12/04	13:26:43	attn
+880172230474	22/12/04	13:26:48	attn
+880172798525	22/12/04	13:26:53	Reg.prog1.amitabh.BRAC
+880173013365	22/12/04	13:26:54	Attn
+880172832211	22/12/04	13:26:57	attn
+880172977503	22/12/04	13:26:59	attn
+880176835595	22/12/04	13:27:36	attn
+880172105137	22/12/04	13:28:35	attn
+880171876909	22/12/04	13:28:37	Attn
+880189502590	22/12/04	13:22:59	ATTN
+880172720366	22/12/04	13:30:00	q1b
+880176552088	22/12/04	13:30:02	q1b
+880172798525	22/12/04	13:30:17	Attn
+880172832211	22/12/04	13:30:17	q1b
+880172696308	22/12/04	13:30:31	Q1b
+880171876909	22/12/04	13:30:32	Q1b
+880172977503	22/12/04	13:30:40	Q1b
+880176412311	22/12/04	13:30:45	q1a
+880172105137	22/12/04	13:30:46	q1b
+880172798525	22/12/04	13:30:54	Attn
+880176835595	22/12/04	13:30:55	Q1b
+880172844972	22/12/04	13:31:00	Q1b
+880173013365	22/12/04	13:31:25	Attnq1a
+880172823901	22/12/04	13:31:48	q1b
+880176593790	22/12/04	13:31:49	B
+880172230474	22/12/04	13:31:51	Q1.d
+880172798525	22/12/04	13:32:34	Q1.b
+880172823901	22/12/04	13:33:38	Attn

+880189502590	22/12/04	13:25:45	ATTN
+880176593790	22/12/04	13:34:10	Q2c
+880172720366	22/12/04	13:34:11	q2c
+880176552088	22/12/04	13:34:13	q2c
+880172798525	22/12/04	13:34:14	Q2c
+880172105137	22/12/04	13:34:14	q2c
+880173013365	22/12/04	13:34:18	Q2c
+880176412311	22/12/04	13:34:20	q2c
+880176835595	22/12/04	13:34:23	Q2c
+880172230474	22/12/04	13:34:24	Q2c
+880172696308	22/12/04	13:34:25	Q2c
+880171876909	22/12/04	13:34:31	Q2c
+880172977503	22/12/04	13:34:33	Q2c
+880172832211	22/12/04	13:34:34	q2c
+880172696308	22/12/04	13:34:34	Q2c
+880172823901	22/12/04	13:34:46	Q2c
+880172977503	22/12/04	13:34:59	Q2c
+880172230474	22/12/04	13:35:08	Q2c
+880176552088	22/12/04	13:37:06	q3c
+880173013365	22/12/04	13:37:15	Q3c
+880172696308	22/12/04	13:37:16	Q3a
+880171876909	22/12/04	13:37:23	Q3c
+880172720366	22/12/04	13:37:24	q3c
+880172230474	22/12/04	13:37:27	Q3c
+880176835595	22/12/04	13:37:29	Q3c
+880172798525	22/12/04	13:37:30	Q3b
+880172977503	22/12/04	13:37:39	Q3b
+880172105137	22/12/04	13:37:42	q3c
+880172832211	22/12/04	13:37:43	q3a
+880172844972	22/12/04	13:37:43	Q3c
+880172823901	22/12/04	13:37:51	Q3a
+880176412311	22/12/04	13:38:42	q3d

+880176593790	22/12/04	13:38:57	Q3D
+880176484892	22/12/04	13:39:13	Reg.prog1.Shamima Siddiqua.BRAC
+880176484892	22/12/04	13:43:12	attn
+880188042524	22/12/04	13:26:02	attn
+880172696308	22/12/04	13:43:59	Q4c
+880173013365	22/12/04	13:44:00	Q4C
+880172977503	22/12/04	13:44:04	Q4c
+880176552088	22/12/04	13:44:09	q4d
+880176412311	22/12/04	13:44:13	q4d
+880172105137	22/12/04	13:44:14	Q4d
+880172720366	22/12/04	13:44:15	q4c
+880172823901	22/12/04	13:44:19	Q4b
+880176593790	22/12/04	13:44:20	Q4C
+880172832211	22/12/04	13:44:23	q4b
+880172230474	22/12/04	13:44:26	Q4c
+880176835595	22/12/04	13:44:33	Q4c
+880171876909	22/12/04	13:44:37	Q4c
+880172844972	22/12/04	13:44:46	Q4c
+880176484892	22/12/04	13:44:59	attn
+880172696308	22/12/04	13:47:44	Q5b
+880172105137	22/12/04	13:47:46	Q5b
+880172720366	22/12/04	13:47:46	q5b
+880172977503	22/12/04	13:47:48	Q5b
+880173013365	22/12/04	13:47:49	Q5B
+880176835595	22/12/04	13:47:52	Q5b
+880172798525	22/12/04	13:47:57	Q5b
+880172823901	22/12/04	13:47:58	Q5b
+880176412311	22/12/04	13:47:58	q5b
+880172844972	22/12/04	13:48:02	Q5b
+880176552088	22/12/04	13:48:03	q5b
+880176484892	22/12/04	13:48:08	q5b

+880172832211	22/12/04	13:48:12	q5b
+880171876909	22/12/04	13:48:15	Q5b
+880176593790	22/12/04	13:48:41	Q5B
+880171876909	22/12/04	13:48:51	Q5b
+880176593790	22/12/04	13:52:01	ATTN
+880173013365	22/12/04	13:53:01	Q8d
+880172696308	22/12/04	13:53:36	Q8d
+880189405131	22/12/04	13:27:01	Attn
+880189502590	22/12/04	13:27:13	ATTN
+880176412311	22/12/04	13:53:47	q8c
+880176835595	22/12/04	13:53:49	Q8c
+880172105137	22/12/04	13:53:58	Q8c
+880172720366	22/12/04	13:53:59	q8c
+880176552088	22/12/04	13:54:00	q8c
+880176593790	22/12/04	13:54:04	Q8C
+880172977503	22/12/04	13:54:16	Q8b
+880171876909	22/12/04	13:54:19	Q8c
+880172696308	22/12/04	13:58:05	Q10c
+880172696308	22/12/04	13:58:22	Q10c
+880176412311	22/12/04	13:58:30	q10c
+880172720366	22/12/04	13:58:31	q10c
+880172696308	22/12/04	13:58:31	Q10c
+880172977503	22/12/04	13:58:32	Q10c
+880173013365	22/12/04	13:58:34	Q10c
+880172832211	22/12/04	13:58:35	q10c
+880172844972	22/12/04	13:58:37	Q10c
+880176552088	22/12/04	13:58:39	q10c
+880172105137	22/12/04	13:58:39	Q10c
+880176835595	22/12/04	13:58:50	Q10c
+880176593790	22/12/04	13:59:20	Q9C
+880171876909	22/12/04	13:59:48	Q10c
+880189502590	22/12/04	13:29:47	Q1B

E. SENDING MESSAGE LOG

The following table contains the messages that were sent by the Question Answer System. The shaded messages were sent to the participants automatically by the question answer system.

880171442013	12/22/2004 01:28:38 AM "Quadratic Function , Start: 12/22/2004, End: 12/22/2004, 1 Lectures" OLE: Send_Message
880188042525	12/22/2004 01:31:32 AM "Quadratic Function , Start: 12/22/2004, End: 12/22/2004, 1 Lectures" OLE: Send_Message
880171442013	12/22/2004 01:31:38 AM "Quadratic Function , Start: 12/22/2004, End: 12/22/2004, 1 Lectures" OLE: Send_Message
880172961628	12/22/2004 01:35:57 AM "You have been successfully registered for PROG1" OLE: Send_Message
880171442013	12/22/2004 01:36:08 AM "You have been successfully registered for PROG1" OLE: Send_Message
880171442013	12/22/2004 01:40:34 AM "Quadratic Function class is about to start within 10 minutes" OLE: Send_Message
880172961628	12/22/2004 01:40:40 AM "Quadratic Function class is about to start within 10 minutes" OLE: Send_Message
880172961628	12/22/2004 01:43:50 AM "BRAVO you are the attentive student of this class" OLE: Send_Message
880171442013	12/22/2004 01:43:56 AM "BRAVO you are the attentive student of this class" OLE: Send_Message
880171442013	12/22/2004 01:50:46 AM "You Did not attempted Ques No 5" OLE: Send_Message
880188042524	12/22/2004 12:21:25 PM "Quadratic Function , Start:

12/22/2004, End: 12/22/2004, 1 Lectures" OLE: Send_Message
880172961628 12/22/2004 01:16:04 PM "Quadratic Function , Start: 12/22/2004, End: 12/22/2004, 1 Lectures" OLE: Send_Message
880172844972 12/22/2004 01:16:26 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172720366 12/22/2004 01:16:37 PM "You have been successfully registered for PROG1" OLE: Send_Message
880176412311 12/22/2004 01:17:20 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172849812 12/22/2004 01:17:30 PM "You have been successfully registered for PROG1" OLE: Send_Message
880171288829 12/22/2004 01:17:49 PM "You have been successfully registered for PROG1" OLE: Send_Message
880176835595 12/22/2004 01:18:05 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172105137 12/22/2004 01:18:12 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172696308 12/22/2004 01:18:20 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172832211 12/22/2004 01:18:33 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172230474 12/22/2004 01:18:45 PM "The program id does not exit;please check whether your program is PROG" OLE: Send_Message
880176552088 12/22/2004 01:18:59 PM "You have been successfully registered for PROG1" OLE: Send_Message
880189405131 12/22/2004 01:19:15 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172977503 12/22/2004 01:19:52 PM "You have been successfully registered for PROG1" OLE: Send_Message
880189502590 12/22/2004 01:20:19 PM "You have been successfully registered for PROG1" OLE: Send_Message
880171876909 12/22/2004 01:20:37 PM "You have been successfully

registered for PROG1" OLE: Send_Message		
880172823901	12/22/2004 01:20:46 PM	"You have been successfully registered for PROG1" OLE: Send_Message
880189419681	12/22/2004 01:20:52 PM	"You have been successfully registered for PROG1" OLE: Send_Message
880172230474	12/22/2004 01:21:04 PM	"You have been successfully registered for PROG1" OLE: Send_Message
880171876909	12/22/2004 01:21:30 PM	"You have been already enlisted for PROG1" OLE: Send_Message
880173013365	12/22/2004 01:21:37 PM	"You have been successfully registered for PROG1" OLE: Send_Message
880176412311	12/22/2004 01:22:54 PM	"You are too late for attending the class" OLE: Send_Message
880172105137	12/22/2004 01:23:27 PM	"You are too late for attending the class" OLE: Send_Message
880172849812	12/22/2004 01:23:34 PM	"You are too late for attending the class" OLE: Send_Message
880176552088	12/22/2004 01:23:41 PM	"You are too late for attending the class" OLE: Send_Message
880171876909	12/22/2004 01:23:48 PM	"You are too late for attending the class" OLE: Send_Message
880172696308	12/22/2004 01:28:01 PM	"You are too late for attending the class" OLE: Send_Message
880172832211	12/22/2004 01:28:12 PM	"You are too late for attending the class" OLE: Send_Message
880172823901	12/22/2004 01:28:17 PM	"You are too late for attending the class" OLE: Send_Message
880172823901	12/22/2004 01:28:17 PM	"You are too late for attending the class" OLE: Send_Message
880176593790	12/22/2004 01:29:34 PM	"You have been successfully registered for PROG1" OLE: Send_Message
880172720366	12/22/2004 01:30:43 PM	"BRAVO you are the attentive

student of this class" OLE: Send_Message		
880172696308	12/22/2004 01:31:28 PM	"BRAVO you are the attentive student of this class" OLE: Send_Message
880172844972	12/22/2004 01:31:34 PM	"BRAVO you are the attentive student of this class" OLE: Send_Message
880171876909	12/22/2004 01:31:43 PM	"BRAVO you are the attentive student of this class" OLE: Send_Message
880176552088	12/22/2004 01:31:53 PM	"BRAVO you are the attentive student of this class" OLE: Send_Message
880176412311	12/22/2004 01:32:00 PM	"BRAVO you are the attentive student of this class" OLE: Send_Message
880172230474	12/22/2004 01:32:07 PM	"BRAVO you are the attentive student of this class" OLE: Send_Message
880172798525	12/22/2004 01:32:13 PM	"You have been successfully registered for PROG1" OLE: Send_Message
880173013365	12/22/2004 01:32:20 PM	"BRAVO you are the attentive student of this class" OLE: Send_Message
880172832211	12/22/2004 01:32:27 PM	"BRAVO you are the attentive student of this class" OLE: Send_Message
880172977503	12/22/2004 01:32:35 PM	"BRAVO you are the attentive student of this class" OLE: Send_Message
880176835595	12/22/2004 01:32:44 PM	"BRAVO you are the attentive student of this class" OLE: Send_Message
880172105137	12/22/2004 01:32:51 PM	"BRAVO you are the attentive student of this class" OLE: Send_Message
880171876909	12/22/2004 01:32:58 PM	"You are already attending the class" OLE: Send_Message
880189502590	12/22/2004 01:33:52 PM	"BRAVO you are the attentive student of this class" OLE: Send_Message
880172798525	12/22/2004 01:34:52 PM	"You are already attending the class" OLE: Send_Message
880172798525	12/22/2004 01:35:30 PM	"You are already attending the

class" OLE: Send_Message		
880172823901	12/22/2004 01:35:53 PM	"You are absent for today" OLE: Send_Message
880172230474	12/22/2004 01:36:00 PM	"You Did not attempted Ques No 1" OLE: Send_Message
880173013365	12/22/2004 01:36:07 PM	"You Did not attempted Ques No 1" OLE: Send_Message
880189502590	12/22/2004 01:36:13 PM	"You Did not attempted Ques No 1" OLE: Send_Message
880172823901	12/22/2004 01:37:37 PM	"BRAVO you are the attentive student of this class" OLE: Send_Message
880189502590	12/22/2004 01:37:48 PM	"You are already attending the class" OLE: Send_Message
880176593790	12/22/2004 01:38:32 PM	"You are absent for today" OLE: Send_Message
880172798525	12/22/2004 01:38:49 PM	"You are absent for today" OLE: Send_Message
880172844972	12/22/2004 01:39:58 PM	"You Did not attempted Ques No 2" OLE: Send_Message
880189502590	12/22/2004 01:40:04 PM	"You Did not attempted Ques No 2" OLE: Send_Message
880172977503	12/22/2004 01:40:11 PM	"You are late" OLE: Send_Message
880172230474	12/22/2004 01:40:17 PM	"You are late" OLE: Send_Message
880171288829	12/22/2004 01:40:33 PM	" You are absent for the 12-22-2004 Class of PROG1" OLE: Send_Message
880172849812	12/22/2004 01:40:40 PM	" You are absent for the 12-22-2004 Class of PROG1" OLE: Send_Message
880189405131	12/22/2004 01:40:46 PM	" You are absent for the 12-22-2004 Class of PROG1" OLE: Send_Message
880189419681	12/22/2004 01:40:53 PM	" You are absent for the 12-22-

2004 Class of PROG1" OLE: Send_Message		
880172798525	12/22/2004 01:42:01 PM	"You are absent for today" OLE: Send_Message
880176593790	12/22/2004 01:42:56 PM	"You are absent for today" OLE: Send_Message
880189502590	12/22/2004 01:43:02 PM	"You Did not attempted Ques No 3" OLE: Send_Message
880176484892	12/22/2004 01:43:23 PM	"You have been successfully registered for PROG1" OLE: Send_Message
880176484892	12/22/2004 01:47:11 PM	"You are too late for attending the class" OLE: Send_Message
880188042524	12/22/2004 01:47:44 PM	"You are Not Valid Participant" OLE: Send_Message
880172720366	12/22/2004 01:48:36 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880172844972	12/22/2004 01:48:45 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880171876909	12/22/2004 01:48:54 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880176552088	12/22/2004 01:49:02 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880176412311	12/22/2004 01:49:08 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880172230474	12/22/2004 01:49:15 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880172832211	12/22/2004 01:49:21 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880172977503	12/22/2004 01:49:28 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880176835595	12/22/2004 01:49:35 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880172105137	12/22/2004 01:49:41 PM	"You Did not attempted Ques No

4" OLE: Send_Message		
880189502590	12/22/2004 01:49:48 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880172823901	12/22/2004 01:49:54 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880172720366	12/22/2004 01:50:00 PM	"You are late" OLE: Send_Message
880172823901	12/22/2004 01:50:06 PM	"You are late" OLE: Send_Message
880176593790	12/22/2004 01:50:12 PM	"You are late" OLE: Send_Message
880172832211	12/22/2004 01:50:18 PM	"You are late" OLE: Send_Message
880172230474	12/22/2004 01:50:25 PM	"You are late" OLE: Send_Message
880176835595	12/22/2004 01:50:31 PM	"You are late" OLE: Send_Message
880171876909	12/22/2004 01:50:37 PM	"You are late" OLE: Send_Message
880172844972	12/22/2004 01:50:43 PM	"You are late" OLE: Send_Message
880176484892	12/22/2004 01:50:49 PM	"You are too late for attending the class" OLE: Send_Message
880172798525	12/22/2004 01:52:18 PM	"You are absent for today" OLE: Send_Message
880176484892	12/22/2004 01:52:46 PM	"You are absent for today" OLE: Send_Message
880176593790	12/22/2004 01:53:02 PM	"You are absent for today" OLE: Send_Message
880172230474	12/22/2004 01:53:36 PM	"You Did not attempted Ques No 5" OLE: Send_Message
880189502590	12/22/2004 01:53:42 PM	"You Did not attempted Ques No

5" OLE: Send_Message		
880176593790	12/22/2004 01:55:59 PM	"You are too late for attending the class" OLE: Send_Message
880173013365	12/22/2004 01:56:59 PM	"You are late" OLE: Send_Message
880189405131	12/22/2004 01:57:43 PM	"You are too late for attending the class" OLE: Send_Message
880189502590	12/22/2004 01:57:49 PM	"You are too late for attending the class" OLE: Send_Message
880172720366	12/22/2004 01:58:20 PM	"You Did not attempted Ques No 8" OLE: Send_Message
880172844972	12/22/2004 01:58:26 PM	"You Did not attempted Ques No 8" OLE: Send_Message
880171876909	12/22/2004 01:58:32 PM	"You Did not attempted Ques No 8" OLE: Send_Message
880176552088	12/22/2004 01:58:38 PM	"You Did not attempted Ques No 8" OLE: Send_Message
880176412311	12/22/2004 01:58:44 PM	"You Did not attempted Ques No 8" OLE: Send_Message
880172230474	12/22/2004 01:58:51 PM	"You Did not attempted Ques No 8" OLE: Send_Message
880173013365	12/22/2004 01:58:57 PM	"You Did not attempted Ques No 8" OLE: Send_Message
880172832211	12/22/2004 01:59:04 PM	"You Did not attempted Ques No 8" OLE: Send_Message
880172977503	12/22/2004 01:59:11 PM	"You Did not attempted Ques No 8" OLE: Send_Message
880176835595	12/22/2004 01:59:17 PM	"You Did not attempted Ques No 8" OLE: Send_Message
880172105137	12/22/2004 01:59:23 PM	"You Did not attempted Ques No 8" OLE: Send_Message
880189502590	12/22/2004 01:59:29 PM	"You Did not attempted Ques No

8" OLE: Send_Message
880172823901 12/22/2004 01:59:35 PM "You Did not attempted Ques No 8" OLE: Send_Message
880176412311 12/22/2004 02:02:04 PM "You are late" OLE: Send_Message
880176593790 12/22/2004 02:02:31 PM "You are absent for today" OLE: Send_Message
880176593790 12/22/2004 02:03:54 PM "You are absent for today" OLE: Send_Message
880172230474 12/22/2004 02:04:10 PM "You Did not attempted Ques No 10" OLE: Send_Message
880189502590 12/22/2004 02:04:16 PM "You Did not attempted Ques No 10" OLE: Send_Message
880172823901 12/22/2004 02:04:22 PM "You Did not attempted Ques No 10" OLE: Send_Message
880189502590 12/22/2004 02:07:43 PM "You are late" OLE: Send_Message
880172720366 12/22/2004 02:10:33 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 4;Attmpted: 6;Not attmpted: 2,Pass" OLE: Send_Message
880172696308 12/22/2004 02:10:40 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 6;Attmpted: 7;Not attmpted: 0,Pass" OLE: Send_Message
880172844972 12/22/2004 02:10:47 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 3;Attmpted: 4;Not attmpted: 3,Pass" OLE: Send_Message
880171876909 12/22/2004 02:10:54 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 4;Attmpted: 5;Not attmpted: 2,Pass" OLE: Send_Message
880176552088 12/22/2004 02:11:02 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 4;Attmpted: 5;Not attmpted: 2,Pass" OLE: Send_Message

880176412311	12/22/2004 02:11:10 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 3;Attmpted: 5;Not atmmpted: 2,Pass" OLE: Send_Message
880172230474	12/22/2004 02:11:17 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 1;Attmpted: 2;Not atmmpted: 5,Pass" OLE: Send_Message
880173013365	12/22/2004 02:11:25 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 4;Attmpted: 6;Not atmmpted: 2,Pass" OLE: Send_Message
880172832211	12/22/2004 02:11:33 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 5;Attmpted: 5;Not atmmpted: 2,Pass" OLE: Send_Message
880172977503	12/22/2004 02:11:40 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 4;Attmpted: 5;Not atmmpted: 2,Pass" OLE: Send_Message
880176835595	12/22/2004 02:11:47 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 4;Attmpted: 5;Not atmmpted: 2,Pass" OLE: Send_Message
880172105137	12/22/2004 02:11:55 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 4;Attmpted: 5;Not atmmpted: 2,Pass" OLE: Send_Message
880189502590	12/22/2004 02:12:02 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 0;Attmpted: 0;Not atmmpted: 7,Pass" OLE: Send_Message
880172823901	12/22/2004 02:12:10 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 3;Attmpted: 3;Not atmmpted: 3,Pass" OLE: Send_Message