A FLEXIBLE MOBILE EDUCATION SYSTEM APPROACH

Dr. Arzu BALOĞLU
baloglu@eng.marmara.edu.tr

ABSTRACT
Distance learning is appealing to small business owners, employees, municipalities, state establishments, non-governmental organizations. Distance-learning are ideal for people who have a full-time job or other commitments, who can't take time off to study full time. This might be a professional who needs to update his knowledge or skills, or a mother who wants to refresh her qualifications before re-entering the labor market.

Distance learning platforms have become increasingly popular over the last few years. Typically; the cost is low and flexibility is high for distance learning. In addition to the costs of the courses and training materials, there are the expenses of employee travel, meals, lodging, and transit time. Distance learning removes those expenses from the equation, leaving only the costs of the courses and instructional materials. The rising need for inexpensive, just-in-time training in business and computer technologies has not been lost. This distance learning is any learning that takes place with the instructor and student geographically remote from each other.

Distance learning system should have new ways or solutions because this solution will support smart alternatives. That is, our distance model is named like as flexible and mobility.

In this paper, we propose a large requirements set and some design considerations for distance learning protocols or portal and implementations. Therefore, it is explained that which requirements a useful and easy distance learning should satisfy.

1. LITERATURE SURVEY

Technology has changed the educational landscape in terms of how information is delivered and to whom, the speed of access to information, and in terms of the choice of options for courses, programs, and colleges and universities (Truluck, 2005). Because new technologies different learning styles like distance learning and new education systems like mobile education systems started to become increasingly popular.

It should also be emphasized that is assumed that the Internet students normally will have access to a desktop or laptop computer with Internet connection. This means that the equipment and technologies used when mobile are additions to the students' equipment used when studying at home or at work. It should also be noted that developments were based on the absolute assumption that mobile learners would study in the same group as students not having access to mobile technology. Thus, the design of the learning environment had to cater efficiently for both situations (Rekkedal and et al, 2005).

Distance education is the technology based education alternative which provides easy, fast access to resources; eliminate distance and self-responsibility of learning, home atmosphere environment**.** Distance education environment is the group work without only concentrating gender and receiver communication. It can be done as telecommunicating, audio conferencing or email. It's discussible how effectively receiver or sender do communication, but both of them can be used to deliver information without distance limitation. People who have roles in distance education are students, teacher, designer groups, and directors. Students are main concern which facilitate active role of communication. Teacher has role to guide students. Designer groups are the real establishers of process as technology facilitators. Directors are people who plan and implement education process
(İşman and et al, 2002). To the learner, open and distance learning means more freedom of access, and thereby a wider range of opportunities for learning and qualification For employers, open and distance learning offers the possibility of organizing learning and professional development in the workplace itself, which is often more flexible and saves costs of travel, subsistence etc. These advantages to learners and employers are also important features from the perspective of governments. Traditionally, governments have introduced distance education provision in order to increase access to learning and training opportunity; provide increased opportunities for updating, retraining and personal
enrichment; improve cost-effectiveness of educational resources; support the quality and variety of existing educational structures; enhance and consolidate capacity (Unesco, 2002).

Mobile education is defined as; any service or facility that supplies a learner with general electronic information and educational content that aids in acquisition of knowledge regardless of location and time (Chen and Kinshuk, 2003). Mobile learning or e-learning tools are the result of two converging technologies: computers and mobile

phones. Numerous platforms are available, each with its own advantages, technical specifications and cost. A wireless laptop computer offers the greatest capabilities, including maximum storage and a standard PC platform that enables conventional e-learning and web content. A tablet computer has full computer capabilities without the keyboard has been especially successful for teaching and learning visual subjects. A personal digital assistant (PDA) and Pocket PC are portable and can have many add-ons, but might not be compatible and incur high costs (Workshop Report, 2005).

The major advantages of mobile learning include greater access to appropriate and timely information, reduced cognitive load during learning tasks, and increased interaction with other people and systems. It may be argued that networked mobile devices can help shape a culturally sensitive learning experience that can offer additional and, possibly, more powerful means of encoding, recall, and transfer. In addition, it is very important to consider the development of learning objects as well as the recognition of learning styles, cognitive processing, and motivation of learners (Koole and Ally, 2001).

A current disadvantage is that not all data, which are available on the web, are suitable for some beginning courses. Students may not have acquired sufficient knowledge of a particular field necessary to use available data sets, although these data sets are suitable for many advanced undergraduate courses. Too often, data require professional judgments be made or assume a specialist's knowledge. Desirable attributes when specialists use data, may become a handicap, however, when beginners are exposed to them. Perhaps, data sets that are more appropriate will appear to fill these gaps as more educators recognize needs in their particular area of specialty. **[8]** From another perspective, it's inevitable that there are some problems like finance, communication and organization. Especially in organization, it's very important to define the technical, educational personnel that facilitate the education environments.

The growth of distance learning has an international dimension as well, since countries around the world are using distance learning technologies to enlarge their own course, program, and degree offerings and to import and export education programs and services (Terzi and et al, 2004). In reality, distance learning has existed for well over 100 years. Correspondence courses in Europe were the earliest form of distance learning, and correspondence study remained the norm for distance learning until the middle of this century, when instructional radio and television became popular. (Imel, 1998) Countries such as India and South Africa are heavy importers of distance learning programs as they seek to expand educational opportunities for their own citizens. China, Thailand and Japan employ distance learning technologies to develop their own programs and degrees, bolstering their existing higher education systems. The United States, Australia and the United Kingdom are major exporters of higher education through electronic technology (Eaten, 2001)

2. MARKET AND NEED ANALYSIS

Many reasons are discussible about that market actually needs distance learning. Learnable and instructive information is increasing day by day. Education resources or budgets decreasing but education expenses continuously are increasing. Distances are increasing but Flexible Education is doing constant distance in any where. In addition, technology has big constraints so solutions are produced with these constraints (Yarman and et al, 2004)

2.1. Constraints

Main Constraints during learning process are listed as follows;

1. Time: Distance-learning platform is ideal for people who have a full-time job or other commitments, who can't take time off to study full time. Time must be rescued from locations.
2. Qualification: Every companies and establishments want to release high qualification environments. Eight needs should be work concurrently, because these needs are necessary and sufficient for perfect distance learning service.
3. Flexibility: In 21. Century, flexibility or mobility is the most important word for all people. Flexible Mobile Education System answers this need.
4. Low Cost: Certification system does not spread to all points because cost is high. FMED gives two huge advantages. Banks give special solutions that are bonus system, free education and many installments.
5. Certification: Certification must have an international validity. In addition, score system may be worked in system. Score system has an attendance, exam, feedback etc… Standardization must be applied on system in global world.
6. Dynamic Curriculum Vita: Many CV web sites serve to employees but not measurable, not dynamic, do not have many criteria. This situation is most important point, because all educations is getting old day by day and dieing end of two years.

7. Education Method: Every lesson has a different methods, target groups, targets and content.
8. Education Technology: Technology gives many advantages and solutions. However, these solutions have many sub constraints. Every technological solution is not applicable and feasible opportunities.

2.2. Market Segments

Small Business Companies, municipalities, state establishments, non-governmental organizations are main establishments for education sources. These segments of market are briefly analyzed as follows;

- Small Business Companies

Certification training's industry services always small business companies. Approximately, forty or fifty education types are demanded from companies. These companies has a restrict budgets and many time they reduce education budgets because small business companies are improving company's structure. Distance-learning platforms are ideal for people who have a full-time job or other commitments, who can't take time off to study full time. This might be a professional who needs to update his knowledge or skills, or a mother who wants to refresh her qualifications before re-entering the labor market. Distance learning platforms have become increasingly popular over the last few years. Typically; the cost is low and flexibility is high for distance learning. In addition to the costs of the courses and training materials, there are the expenses of employee travel, meals, lodging, and transit time. Distance learning removes those expenses from the equation, leaving only the costs of the courses and instructional materials. The rising need for inexpensive, just-in-time training in business and computer technologies has not been lost. This distance learning is any learning that takes place with the instructor and student geographically remote from each other. In addition; this education may be supported from banks.

- Municipalities

All municipalities must give education service owns people but classical education system has a many restrictions which are time building, budget, instructor, materials. Municipalities may give free education to all people with distance learning. People can take as people wish.

- State Establishments

State establishment's needs are similar small business employees. Specially, all state establishments gives service every location in country so they continuously give in door education for all employees. Of course, like as all people guess, may give education but all education must have standard level and just in time.

- Non-governmental Organizations

Many non-governmental organizations serve education but it is not enough because a few people can use because reel world restrictions have high costs in all areas. they is similar problem like as all municipalities that must give education service own people but classical education system has a many restrictions which are time building, budget, instructor, materials.

Flexible Mobile Education solution may be monitored, concurrently. If an employee has an internet service, an employee can take a lesson with web site, pda, mobile phone. However, all employees take exam during the asynchronies situations.

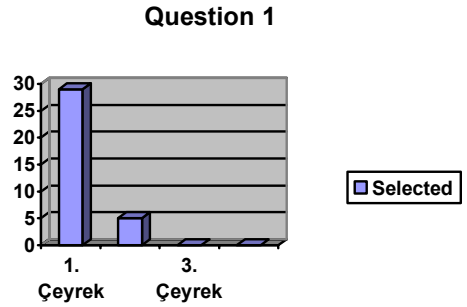
If an employee is not an online, an employee can follow all lessons with computer, mobile phone, pda, smart phone, ipod, mp3 player. However, all employees take exam during the asynchronies situations.

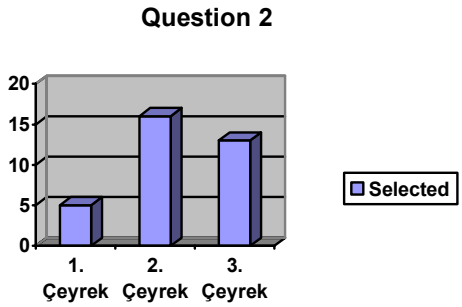
2.3. A Questionnaire Survey

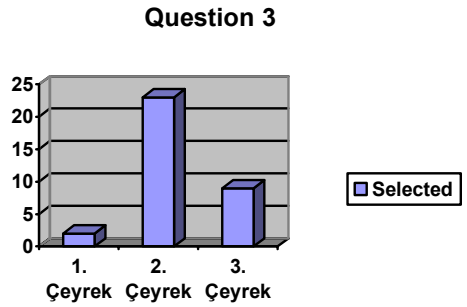
In order to determine of actual market need, a survey hereby was carried out by questionnaire with about 35 participants to determine profile of people who are potential for distance education. They are randomly chosen from different categories such as undergraduate and postgraduate students, with graduated and workers.

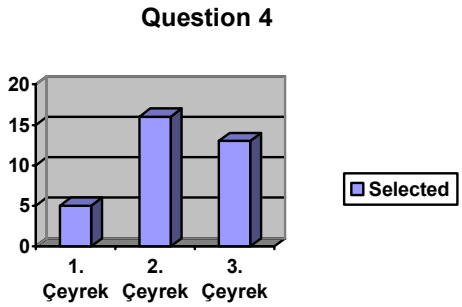
All the participants were asked to learn ideas about normal and distance education, which one is more suitable for their schedule, and which one is more efficient for their education. According to these needs, it has been prepared a questionnaire contained 15 questions. The questionnaire and its results are enclosed on appendix.

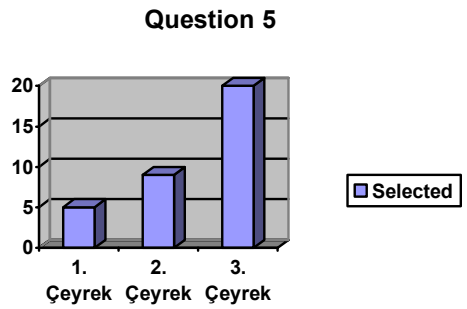
Results:

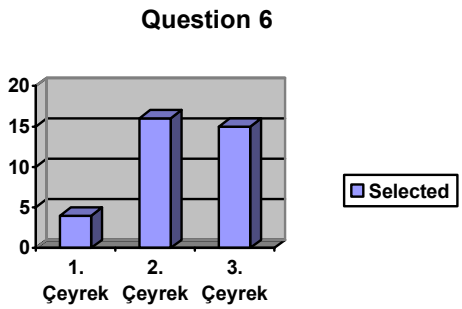

Question 1
30
25
20
15
10
5
0
1. Çeyrek
3. Çeyrek
Selected

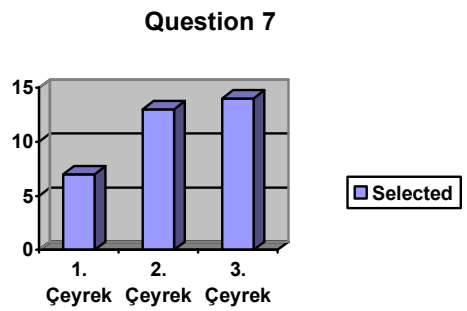

Question 2
20
15
10
5
0
1. Çeyrek
2. Çeyrek
3. Çeyrek
Selected

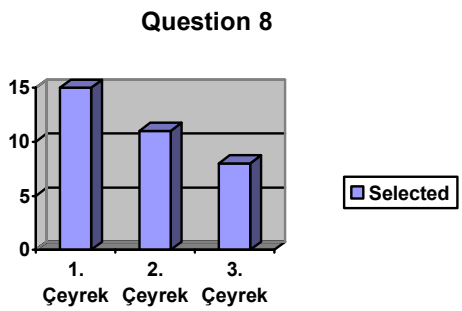

Question 3
25
20
15
10
5
0
1. Çeyrek
2. Çeyrek
3. Çeyrek
Selected

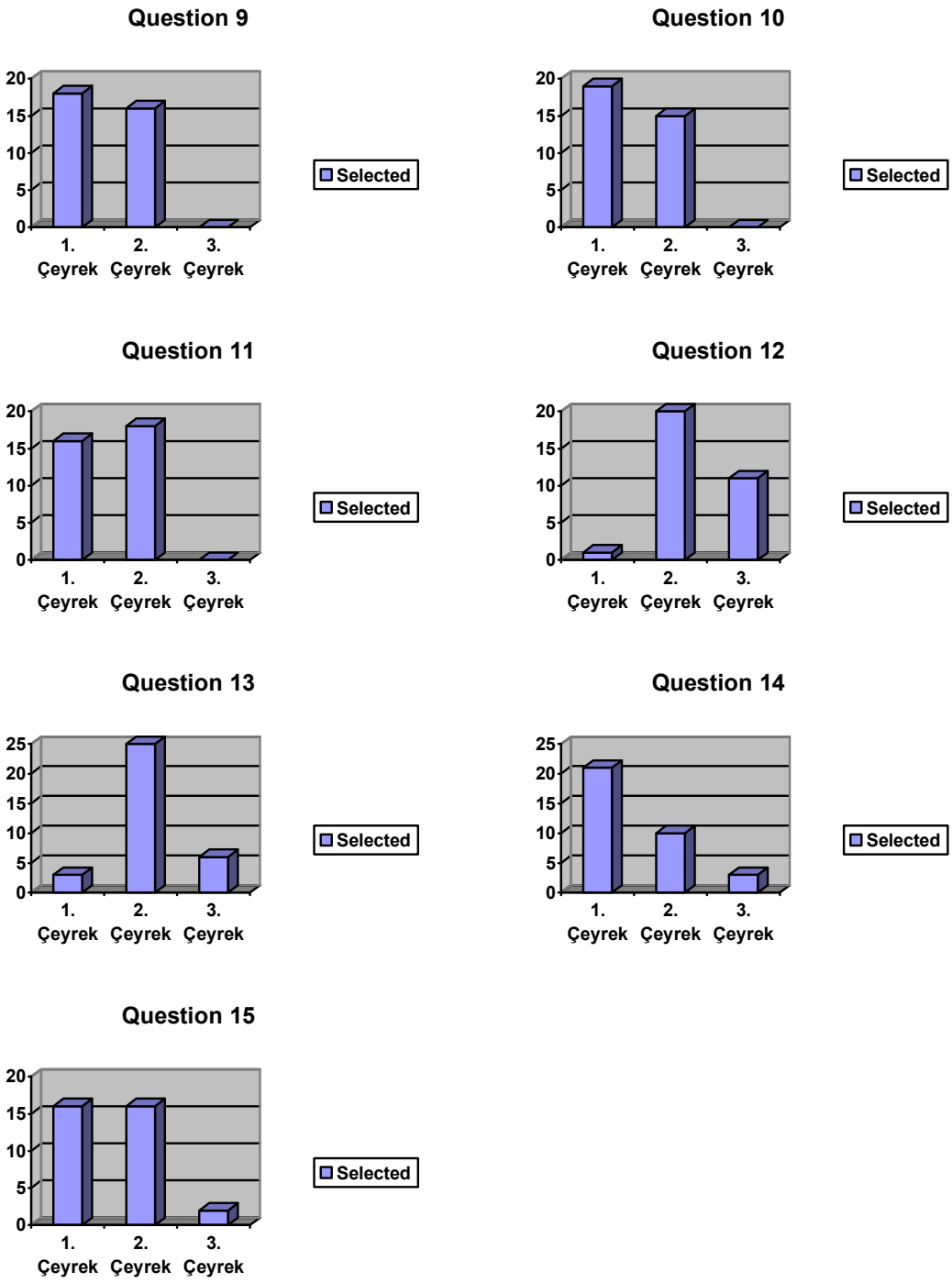

Question 4
20
15
10
5
0
1. Çeyrek
2. Çeyrek
3. Çeyrek
Selected


Question 5
20
15
10
5
0
1. Çeyrek
2. Çeyrek
3. Çeyrek
Selected


Question 6
20
15
10
5
0
1. Çeyrek
2. Çeyrek
3. Çeyrek
Selected


Question 7
15
10
5
0
1. Çeyrek
2. Çeyrek
3. Çeyrek
Selected


Question 8
15
10
5
0
1. Çeyrek
2. Çeyrek
3. Çeyrek
Selected



The questionnaire revealed that participants generally think that classroom discussions and having face-to-face interaction with instructions is somewhat important. Because of being accustomed to face-to-face learning they want to feel that they are part of the class. Most of the participants have used some sort of web-based educational system. But they haven't tried mobile education systems before. From this, we safely concluded that use of mobile technology in education was still quite new to most participants. When asked whether they will be willing to use a mobile education service system, most participants agreed that they will but some also disagreed.

When asked about their writing and communication skills we conclude that they have enough background to use mobile education systems. They are self motivated and they sometimes procrastinate works but always get work

done on time. Therefore they can manage to develop themselves effectively by taking distance courses. Moreover some of them hesitate to ask questions in the class and sometimes they have difficulty getting to the campus (especially for on weekends and in the evening). Distance education can be done as telecommunicating, audio conferencing or email. So it will eliminate cost and time and allow learners to ask questions by e-mail.

When asked about predominant learning styles of participants; we realized that they have different learning styles. It is difficult in a classroom to respond all students with different learning styles. Some of them can learn best when they see graphics and read class materials, some learn best when they listen to an explanation of concept and some prefer doing practice (for instance conducting an experiment in a lab). Because distance learning provides visual and vocal education it is a good learning technique for the students having different learning styles.

3. NEED DISCUSSION

Lifelong learning is most important issue for all people in the 21. Century. A computer, a digital TV or coming TV technology that is IP TV, mobility tools that are IPOD, MP3 Player, mobile phone, and smart phone came to many people.

Classical education techniques are an insufficiency. Classical education must need building, expensive investment, time, more materials, and maximum instructors. We may guess, its situation is not feasible and applicable. In addition; professionals or employees has taken classical educations but all information is living maximum for four year then that information goes the information's rubbish heap.

We should find a new solution or equation for optimum solutions that involves minimum time or effective time, low cost, high performance, flexible, standard, just in time. Of course, these conditions are located with measurable system that occurs data analyses, data mining and business intelligence methods, because all companies or states need quantitative information for future years and education policy.

What is the solution? This solution is very easy. We may be carefully this point that is an innovative and puzzle management system. Puzzle management system finds optimum web or network between all pieces which are TV, computer system, IPOD; MP3 Player, Mobile Phone, Smart Phone, life, time, budget, needs, people.

4. MODEL OF THIS APPROACH

Flexible Mobile Learning can be called as Certification Platform Management System (CPMS) (Yurdakul and et al, 1996). Below is practically included the tools of the model to be integrated later.

Computer

Desktop, laptop is used with internet technology in FMED. Video streaming, mp3 format, mail, chat rooms, conferencing is used.

PDA

PDA uses GPRS, WAP, video streaming, and office programs.

IPOD

All lessons are taken from system and offline or online service is open

MP3 PLAYER

If lesson does not have an image, people listens lessons

MOBILE PHONES

Mobile phone uses GPRS, WAP, video streaming, and office programs

IP or DIGITAL PLATFORM TV

All lessons are taken from system and offline or online service is open

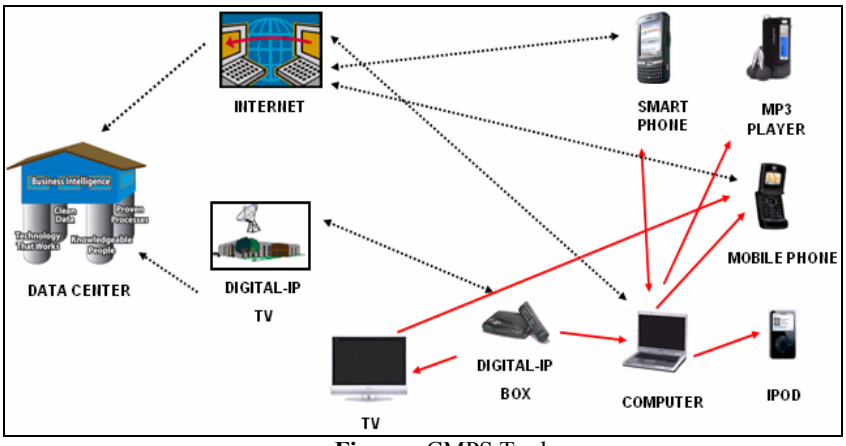


Figure: CMPS Tools

In this approach, the below services should be definitely covered in the design (Sterner and Rigmor, 1998; Varol and Asaf, , 1996).

- One-to-One Education
- Classroom Education
- Web and IP TV Based syncrone or asyncrone education
- Individual Certification
- Test and Analyze just in time on Web, Mobile Phone, IP TV, Mobile Phone, Smart Phone or PDA.
- Education necessity analyze, planning and dynamic curriculum vita
- Analysis, reporting and scoring for person, classroom, companies, region or state
- To Measure and establish so to present new professional development.
- Special education with code on IP TV
- Web cast
- Multicast
- Video on demand
- Electronic publishing
- Online Conservation Clubs and Reel Meeting
- Correspondence tutoring
- Audio conferencing
- Telephone tutoring
- Video conferencing
- Electronic mail
- Computer conferencing
- Audio-graphics
- Video streaming.

Most eLearning situations can use combination of the above techniques

5. ADVANTAGES OF THIS APPROACH

Flexible Mobile Education System (FMED) has many advantages according to other classical and distance learning methods.

- FMED has a synchronize system between Digital TV, Mobile Phone and Web Site.
- FMED measures reel education investment for individual (Miller and Aron, 1991).
- FMED educates all employees with different methods (Miller and Aron, 1991).
- Motivation and retention or loyalty educations are given with FMED on TV, mobile phone and Web Site, concurrently.
- Many education companies may give different educations with in increasing learning Opportunities (Miller and Aron, 1991).

- Same time, Many people may take education in different locations with different ways.
- Specialists give much information at reel time from different locations.
- Every person may take indivudally education method. That is, flexible choosing for method and Environment (Miller and Aron, 1991).
- FMED produces many solutions for all companies with constant resource or low resource so material sharing will be realized maximum.
- FMED gives comfortable and freedom spirit for productivity. That is, any employee or person can be taken in own working area or as you wish location with Digital TV, Mobile Phone, Web Site, MP3 Player, IPOD.
- Education and traveling expenses are decreased with FMED.
- Education environment and reel working environment are coming same with FMED besides living environment or any location.
- Information reaching will be come easy situation.
- In every instant, all people will pull information.
- Easy information winning give advantages for competition with FMED.

6. CONCLUSION

In this paper, main elements and basic properties of flexible mobile education had been explained, its important points had been explained, necessary and sufficient conditions clearly had been determined.

To determine needs and ideas of university students about distance learning it has been applied a questionnaire, and according to the questionnaire results; distance learning is a new area for students. Only a few of them have experience about mobile education but they consider attending distance education courses in order to develop themselves. Since mobile education provides visual and vocal learning it will be helpful with students having different learning styles.

Research comparing distance education to normal education indicates that a well organized distance education can be more effective than normal education. It can eliminate time, geographical boundaries and obstacles for opportunities for people who want to develop themselves. Moreover it can provide learners gain immediate and ongoing access to; peers, dynamically updated information and experts who help students to determine the value of information found on both the internet and real-world environment.

One important fact is that; all students have different learning styles and when using mobile devices they may be in different places. Therefore they may feel disconnected from learning activities so a motivation model is needed including well designed learning materials to cater to different learning styles.

Research showed education is one of the most important issues and education should be mobile. This paper will be pioneer article for distance education system mathematical modeling. The pioneering efforts continue. Fully online programs will be at the core of colleges and universities efforts to expand access to postsecondary education in the world. Utilizing the framework to assess institutional capacity to deliver these critical services and then creating solutions to provide them should better position colleges and universities for success.

As future work of this study it can be designed a prototype system to review how to conduct.

REFERENCES

Chen, J. and Kinshuk, "Mobile Technology in Educational Services". Advanced Learning Technologies Research Centre Massey University, Palmerston North, New Zealand

Eaton, J. (2001) Chea Monograph Series, Number 1; Distance Learning: Academic and Political Challenges for Higher Education Accreditation

UNESCO (2002). Open and Distance Learning: Trends Policy and Strategy Considerations. Rekkedal, T. Dye, A. & Fagerberg, T. (2005) "Mobile Distance Learning with PDA – Development and Testing of an

Always Online Multi Media Environment" Paper presented to the conference "mLearning - The future of Mobile?" Dun Lahoghaire, Co. Dublin, Ireland,

İşman, A. Dabaj, F. Altınay, Z. Altınay, F. (2002) "The evaluation of Students' Perceptions of Distance Education". Eastern Mediterranean University.

Imel, S.. (1998) "Distance Learning, Clearing House on Adult, Career and Vocational Education", Athabasca University

Truluck, J. (2005) "Establishing a Mentoring Plan for Improving Retention in Online Graduate Degree Programs". The University of Georgia

Terzi, S. Çelik A. (2004) Süleyman Demirel University, Computer Sciences Research and Application Center, 32260 Isparta, TURKEY; "Teacher - Student Interactions In Distance Learning"

Miller, A.(1991). Applications of Computer to Teacher Education and Human Resource Developments. Colombus. Ohio.

Workshop Report, (2005) International Workshop on Mobile Learning for Expanding Educational Opportunities 16 -20 May 2005, Tokyo, Japan

Wang, Y. Wang, H. and Shee. D. (2005) "Measuring e-learning systems success in an organizational context: Scale development and validation.", Taiwan

Varol, A.. (1996) "Televizyon-Tele-Konferans ve İnternet Sistemlerinin Uzaktan Eğitim Amaçlı Kullanımı. Türkiye I. Uzaktan Eğitim Sempozyumu," 12-15 Kasım 1996. MEB. Ankara

Yarman B.S, Seckin I., Erel A. Sahin M., Basaran M, (2004) "Pamukova Train Accident", Report presented to Ministry of Transportation, Turkey, Ankara, December (396 pages).

Yurdakul, İncilay; Şener, Bahar. Erdinç, Şansal. (1996) Çocuğa Yönelik Multimedya Ürünlerinin değerlendirilmesi. Türkiye I. Uzaktan Eğitim Sempozyumu, 12-15 Kasım MEB. Ankara

Appendix:

Questionnaire:

1. What is your current study?
   - ☐ Undergraduate Program (Bachelor)
   - ☐ Postgraduate Program (Master, Degree, etc)
   - ☐ Professional Development (single course)

2. Having face-to-face interaction with my instructors and fellow students is:
   - ☐ Not particularly important to me
   - ☐ Somewhat important to me
   - ☐ Very important to me

3. Classroom discussion is:
   - ☐ Rarely helpful to me
   - ☐ Sometimes helpful to me
   - ☐ Almost always helpful to me

4. My need to take a distance delivered program is:
   - ☐ High -- I need it for a new job, career advancement or other important reason.
   - ☐ Moderate -- I think a regular campus is better, but I want to consider online.
   - ☐ Low -- It's a personal interest that could be postponed.

5. Considering my professional and personal schedule, the amount of time I have to work on an online program is:

- ☐ Over 15 hours per week.
- ☐ 12-15 hours per week.
- ☐ less than 12 hours per week

6. If I had to describe my predominant learning style/preference, I would say it is:
   - ☐ Auditory -- I learn best when I can listen to an explanation of a concept.
   - ☐ Visual -- I learn best when I can read the course materials or view graphics and other visuals.
   - ☐ Tactile -- I learn best by "doing" (for instance conducting an experiment in a lab).
7. Feeling that I am part of a class is:
   - ☐ Not particularly necessary to me.
   - ☐ Somewhat important to me
   - ☐ Very important to me
8. If I have to go to campus to take exams or complete work:
   - ☐ I can go to campus anytime.
   - ☐ I need for campus labs to be open evenings and weekends
   - ☐ I have difficulty getting to the campus, even in the evenings and on weekends.
9. I am able to motivate myself to complete my work:
   - ☐ With little or no help from others
   - ☐ With some degree of help from others
   - ☐ Only with the help of others
10. My skill using the internet is:
    - ☐ Above average
    - ☐ Average
    - ☐ Below average
11. My writing and communication skills are:
    - ☐ Above average
    - ☐ Average
    - ☐ Below average
12. I am considering taking an online course because:
    - ☐ I've taken an online class before and enjoyed the experience.
    - ☐ I'm curious about online classes and have room in my schedule.
    - ☐ I need the class for a graduation requirement or job situation and I can't fit it in to my campus schedule.
13. When it comes to procrastination:
    - ☐ I rarely procrastinate

- ☐ I sometimes procrastinate, but I always get my work in on time
- ☐ I always procrastinate - I like to work under pressure

14. I would describe my personal style as:
    - ☐ Self-motivated, self-disciplined and organized
    - ☐ Motivated, but I need help remembering assignments and due dates
    - ☐ Pretty disorganized - I need someone to motivate me and help me stay on top of my coursework
15. When I need help in class:
    - ☐ I feel comfortable asking questions and asking for help when I need it
    - ☐ I hesitate to ask questions of the instructor, but I will ask for help if I need it
    - ☐ I don't like to ask questions or ask for help