Sustainable E-Education Through Mobile Enabled Technology

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Abstract: This paper explains the dynamics of Mobile learning and its academic implications within the education system of India. The emergence of learning technologies is progressively adopted for rapid delivery and cost-effective purposes. The focus is given on the ways in which to integrate new teaching tools into e-education to encourage mobile based education, to conquer main hurdles of money, access and isolation.

In other words, technology is able to surpass the relative deprivation in the multicultural groups. Mobile learning appropriates the self-motivation and play impulse of the young learners in providing sustainable e-education to the students. This paper seeks to benefit various stakeholders in the education, telecommunication, industries in rural area and policy making sectors by providing meaningful insight into the large-scale and small challenges and proposing novel application, service and structured solutions to address the same.

The main objective of this paper is to sum up the ways in which mobile-supported learning can contribute for the cause of universal education by providing quality education for children, youth and adults. The scope of this paper is restricted to the importance of mobile learning, suggestions and recommendations made for the sustainability of e-education through mobile enabled technology.

Keywords: M-learning, Information Communication Technology, Quality education.

I. INTRODUCTION

Learning is a relentless process throughout one's life cycle, without the limitation of age or gender. Through learning one can advance one's knowledge and information. Different types of learning methods provide different opportunities and variety of knowledge. The learning process itself benefits from the advancements of technology as we are provided with enhanced means to train people in variety of ways.

The concept of mobile learning was emerged about a decade ago and got recognition as a new research field when the first dedicated conference for mobile learning was held in 2002 and has become a regular annual event since then. Mobile learning is not only the theme of exceptional interest in conferences but virtually it is displaying reliable growth ahead, since it moving ahead of short time, small-size pilot projects and now prepared to tackle different matters like scale, prolonged growth, assessment and brilliance etc.

Mobile learning is an up-coming research field of learning, which uses mobile technologies as main components in educational environment [1]. Mobile technologies are one of the most speedily growing technologies, which have and continue to achieve popularity for the last couple of decades[9]. Educators, researchers, and industries are interested in using mobile technologies to train students and increase their workforce in the field [5].

Mobile learning is appreciated as a concept that facilitates the learners to learn through their mobile devices. Mobile learning always takes into consideration the mobility of learners. Learning through the use of mobile assists learning at any space and time. Mobile learning is an innovative technique for education and can play a non trivial role for educational institutions. According to Nyiri (2003), quoted by Uzunboylu et al (2009) mobile devices are handy ,easy to operate and do not require any advanced technological training and hence facilitates learning easily[8]. Mobile technology can speed up the process of learning in a quite effective way as students can learn when and where they want [2]. The electronic learning has broadened the boundaries of universities across the borders and doors of knowledge are now opened for those who want to learn at distance. With the discovery of mobile phones, inventors are certainly challenged with developing new ways to utilize mobile technology as an asset to provide quality education in a speedy, remotely available and improved way to the learners [4].

II. SCOPE OF MOBILE LEARNING

Education is considered as the most important aspects for the growth and success of mankind. The purpose of education is to build up good performance, which normally covers the whole accomplishment of life. Education is not just to accept good ethical traits like regularity, value, respect for elders and concern about the sufferings of others, but also the way in which a person lives, the part he plays in social life and spends his free time [12]. Furthermore, the aim of education now is to prepare vibrant and useful members of the country for fast changing developing and dynamic world.

Day by day education has become more essential as world's population has reached its peak of advancements. Poverty is a major problem for the whole world and almost every person has to start work in his very young age. It is furthermore noticed that because of scarcity people compel their children to start work even in their adolescent for their survival. This condition is even worse in Asian countries. In these circumstances a big population is not able to go to school or college. The existing system is not so helpful and does not offer a practical and feasible solution for that sort of problems.

To improve education on a wider level, it is necessary to build up such an efficient system in which learners don't have to go far away to get education, and secondly it should be economically reasonable for the students. For this purpose informal ways of learning are being explored [12].

Distance learning has been considered a good way of learning for a long time but the major difficulty with this kind of learning was the lack of communication and less teacher-student interaction [6]. This one-way communication is a drawback. But, with the development of Internet and World Wide Web, idea of electronic learning was introduced, which is considered as a better alternate to distance learning. In actuality, electronic learning is a next step of distance learning which permits people to learn and communicate by means of Internet.

Electronic learning presents better prospects for students and teachers to communicate and disseminate knowledge more often than distance learning. The student can get lecture from a computer through Internet. Although electronic learning is an outstanding way to learn, but it limits the students to be stuck with their computer all the time and students cannot get information at anytime and anywhere. Non accessibility of information at anytime, anywhere forced to seek new technology that can overwhelm such troubles. Now mobile devices are utilized for mobile learning concept, which appears to advance the educational process.

Information and Communication Technology is playing a vital role to shaping the learning method, by providing better resources to learn remotely. Electronic learning and Distance Education are exceptionally used as an efficient way of learning all over the world [7]. Some informal way of learning such as blogs, groups and discussion forums are very useful to make people educated at the distance.

Mobile technology was presented in 1990s and become the most popular way of communication. An article published in English daily Guardian stated that half of the world population will have the mobile at the end of the year 2008 [11]. The high acceptance rate, mobility and accessibility of established networks and infrastructure are the basis to use mobile devices as a learning means. The concept of mobile learning has emerged tremendously in education but its effectiveness is still in doubt because of its student-teacher relationship. It is widely accepted that the key to mobile learning lies in taking benefits of the learning prospects offered by mobile technologies, and that this generally occurs when learners are not at a enduring, fixed location, so that they are able to engage in situated learning and make use of context-specific resources. Mobile learning also facilitates learners to move effortlessly over varied positions and to connect up learning in different localities [10].

Mobile learning needs to be understood as an promising gamut of learning and teaching practices entrenched in the conviction that communication and association within a traditional classroom are often not as effective as they could be. Mobile learning has been described as 'disruptive' and 'paradigm-shifting', mainly when its focus is on learning outside traditional classrooms or conquering the apparent insufficiencies of existing curricula and forms of evaluation. Mobile learning highlights amalgamation of education with existence and employment, so that education is no longer seen as a separate activity that has to take place in a school, university or other organization. This generates anxiety between traditional education, focused on a set curriculum and individual achievement, and mobile learning, which is constructed around learners' wellbeing and requirements in relation to varied situations and circumstances.

III. MAJOR ADVANTAGES OF MOBILE TECHNOLOGY

There are a lot of benefits for mobile learning as it provides variety of ways for learning especially in educational settings. Some of the major advantages are enlisted as under.

a. **Handy -** This is the main feature for mobile learning that allows easy mobility of mobile devices, which is to be everywhere at anytime without any limitation. Due to small in size and less in weight mobile devices can be easygoing learning tool for students which they can carry with them everywhere.

b. **Social interactivity-** The social interactivity for exchange of information and other activities of students can be increased by using the mobile devices. With these devices one can also interact with teachers and other peer students.

c. **Context sensitivity -** It can help the students to collect the exclusive information from one location which may not be accessible longer. This kind of data can be gathered from particular location, environment, and time which including both existent and simulated data.

d. **Connectivity-** Mobile devices provide easy connectivity to its network all the time and everywhere. This uninterrupted connectivity permits the students to stay linked with other students and teachers for latest update and current activities. This connectivity facilitates the students to create a right collective environment.

Learning has mostly never been tailored to user needs. Individualized instruction can be effortlessly accomplished through mobiles thereby overcoming challenges posed by different degrees of learner capabilities. Since mobiles value privacy and are nonjudgmental they have the potential to provide talent /requirement based learning, concentrated vigilance on specific areas, extra mentoring and counseling. In case of varying degrees of learning aptitudes, slow learners can subscribe to elaborate lesson explanations; this nurtures interest in learning, develops self-assurance and give power to the student.

Mobiles contain various advantages as the perfect media for education, they are multi dimensional levelers. They reduce socio-economic hierarchies; neutralize competency insecurities, slash across geographies and need least hard infrastructure. What makes them the essential technology for the education sector today is that they are also a deep rooted medium of communication in India, due to increasing tele-density. They are a personalized and non-infrastructure dependant medium, not disrupted much by natural and social catastrophes; therefore steady and sustainable. The main features of the media like audio, voice quality, still, video, interactive graphics and numerics work perfectly well to develop exact phonetics and verbal expression, number intelligence, associative, cognitive and rational ability, overall intellectual capacity

and application expertise.

Teaching methodology greatly influenced by mobile technology can effectively promote independent learning among students. Research ascertains that interactive and participatory approaches, lead to practically relevant learning, holistic ability building and functional proficiency , thereby supplementing valuable use of knowledge.

IV. CURRENT STATE OF EDUCATION IN INDIA

India is an rising economy whose core supremacy for the next 25 years is expected to be its youth. The youth (aged below 25 years of age) constitute 41.05% of the overall population. While this 'Demographic Dividend' can yield huge benefit, it also comes with substantial challenges around the need to prepare the youth with basic education and employment in order to provide youngsters with the skills that can help them lead vibrant lives.

India today is facing the biggest problem of providing the fundamental right to education to its next generation as 35% of world's illiterate population is Indian. In spite of seemingly optimistic Gross Enrollment Ratios (GER) being recorded and proactive literacy schemes being introduced, there is a difference between these positive indicators and reality. A high dropout rate of 41.2% is indicated at the primary stage. The national literacy rate of girls is 54% as against 75% for boys. The girls' literacy rates are particularly low, ranging between 33-50% in the Northern states of India. Quality of instruction and learning is also low. Students understanding and application of written and verbal expression, logic and reasoning, numeric and massive knowledge is insufficient [3].

Geographical seclusion and access challenges, regional, gender bias and socio-economic disparity, meager infrastructure, facilities and non-favorable learning environments, academic contents always based on theory rather than practical applicability, physical punishment, unconcerned and untrained teachers and theoretical teaching methodology, are key contributory factors for poor undertakings in the education sector.

In the current scenario education should be seen as a semi-hard infrastructure challenge. Of all infrastructure apprehensions that India faces, education is one that can be speedily resolved through strong computer technology enabled infrastructure networks. Compared to highly significant services like healthcare, finance, electricity, shipping, governance which can be only partially and gradually addressed through computer technology based infrastructure, education embraces a distinct lead.

The kind of educational contents available in India today is of varied nature. The urban youth has been the main focus of interactive educational content ranging from educational lessons to game series in the form of DVDs to e-learning methodologies like Smart Classes offered by Educomp Solutions to Tata Sky's interactive programs[6]. The rural youth on the other hand, can be glimpsed to have get access to computers at best and facing a shortage of even a basic instructor at the worst. Such a wide gap in resource distribution and access, coupled with the substantial price tag of interactive educational services, make existing content and systems unpractical for the cause of universal education.

National education, especially at the primary and secondary levels, has also failed to adapt the advantages of varied technologies that are accessible today for the cause of education. An advancement of wireless technology platforms and mobile enabled solutions, from resolving needs of the society to fulfilling personalized needs, has been seen over the last decade. Some Information Communication Technologies initiatives for community access in the form of e-choupals, village Kiosks and Village connection have now developed into individual custom-made usage services such as Nokia Life Tools but the mechanisms of none of these services can be said to have been exploited as richly as they can be for the purpose of making education accessible.

V. MAJOR CONSTRAINTS AFFECTING M-LEARNING

Policy brief of UNESCO IITE published in December 2010 has revealed the following limitations that have an effect on inclusion of mobile technology in education.

a. *Finance -*The implementation of mobile learning have encompassed sponsorship from device manufacturers which has enabled organizations to supply whole cohorts of learners with devices. It raises issues of ownership and sustainability.

b. *Administration-* The established educators do not like the loss of control implied by mobile learning activities that are learner-led and take place outside the classroom. There is no certainty about digital content rights management which may restrain production of mobile-friendly content.

c. *Proficiency-* Educators often fall deficient in the competences needed to develop mobile learning opportunities for their students. Learners may be familiar with mobile devices in general but not as learning tools. Educators may not feel capable to support learners who are primarily focused on day to day learning, and those who foresee mobile learning to satisfy to their individual preferences or needs.

d. *Usability-* The need to keep a mobile device charged for longer periods of use remains a concern. Costs of connectivity must be considered alongside the cost of the mobile device, as both teachers and learners see this as an obstacle to extensive use. Environmental factors such as sunshine and rain impact on the practicality of learning outdoors. Unnecessary noise and interruptions can impact on the quality of learning in public areas and when travelling.

e. *Restrictions on mobile learning -* Remote areas with low population density rarely have well established broadband technologies such as DSL (Digital Subscriber Line) which use telephone lines, Cable and Internet. Even though Wireless Internet Service Providers provide broadband built around wireless networking, hotspots are small which results into sparse coverage unless roaming facility is used. Satellite Internet offers broadband services on a truly global basis but at an expensive cost. WiMax is anticipated to become the most prevailing broadband technology in remote areas in the near future, mainly due to its low cost of deployment.

f. Possible adverse effects of the use of mobile technology in education-With excessive use of mobile

technologies, human relationships can be adversely affected resulting into rise in stress levels, or feelings of overload. Mobile learning requires some financial assistance and training of teachers.

VI.   RECOMMENDATIONS AND SUGGESTIONS

There is an outstandingly good association between the advantages of mobile learning and the goals of Education for the cause of universal education as set by UNESCO in April 2000. However lot many things needs to be initiated by those who are capable of influencing the growth of mobile learning as mentioned below.

a. Identify the value of learning in unconventional, informal or everyday perspectives and help learners to realize the full breadth of their potential contributions to society.

b. Facilitate geographically isolated, deprived learners to become a valuable teaching asset by providing mobile technologies to help them share their existing skills and proficiency.

c. Invest in further development of mobile enabled teaching methodologies that are distinct from e-learning.

d. Sponsor further research on mobile learning, particularly large and massive projects that are focused on fundamental educational goals and those that explore learning outside the classroom.

e. Work with educational institutions to develop effective mobile learning guidelines.

f. Give training to teachers, to raise awareness, develop self-belief, and transmit new skills and knowledge for the redesign of present curricula and forms of evaluation.

g. Work with companies in telecom sector to make possible more affordable access to mobile and internet browsing.

VII.   CONCLUSION

Education has become one of the most important issues not only for the individuals but for organizations and governments around the world. Since the world is changing rapidly with the advancement in technology, only formal means of education seem not to be enough to meet the requirements of learning needs of present times. Informal ways of learning are also required for that purpose. Mobile enabled technology has played an important role to build and implement new solutions for informal learning. Mobile learning provides the access to teacher and learning contents anytime, anywhere and everywhere. The easy access to learning material and the feelings of to be connected with teacher can produce the efficient and effective learning. Mobile learning can play an important role in future's higher educational setting to be fixed to achieve improved performance.

While a start has been made, practical, efficient and strong service advances are yet to materialize within the existing technology. The true mettle of any technology is realized when it is put under a versatility test. The crux of the issue is exploring and realizing the full possible potential of mobile media technology. Consequently mobiles could be

the next education media platform. This can be achieved through development and introduction of innovative and contextualized services that broaden the functional limits of the media.

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