Journal of Information Technology Management

ISSN #1042-1319

A Publication of the Association of Management

APPLICABILITY OF MOBILE LEARNING ENGINE – MOODLE IN COMPUTER APPLICATION COURSE

MAHENDRA GUPTA
MASTEK PVT. LTD., NAVI MUMBAI, INDIA
mahendramgupta@gmail.com

ELA GOYAL
SIES COLLEGE OF MANAGEMENT STUDIES, NAVI MUMBAI, INDIA
elagoyal@gmail.com

ABSTRACT

With the rapid development of hardware and easily accessible networking technologies, the demand for mobile based education is experiencing a boost. Well-known for their penchant towards adopting new technologies, the younger generation has been the focus for revolutionizing the educational medium. Purpose of this study is to analyze the motivation and readiness of students for m-learning. Mobile Learning Engine, an m-learning tool of a popular Learning Management System-Moodle, was used in a Post-Graduate Computer Applications course. Its feedback from the students' perspective was analyzed. The analysis showed that the students are ready for m-learning, but are concerned about the cost involved in accessing internet through their handheld devices. The participants felt that the handheld device would be more useful for notifications and transferring information, rather than actual reading and learning. The findings of this paper would be useful in understanding how m-learning can be implemented in a higher education institution.

Keywords: m-Learning, Mobile Learning Engine (MLE), Learning Management System (LMS), Moodle, Computer Applications Program.

INTRODUCTION

Mobile Learning, commonly referred to as M-learning, is a form of e-learning that specifically employs wireless communications devices to deliver content and learning support [4]. Mobile learning technologies can include mobile phones, smartphones, PDAs, MP3/ MP4 players (e.g. iPODs,), handheld gaming devices (e.g. Sony PSP, Nintendo DS), netbooks, etc. One of the latest gadgets that is earmarked for taking mobile learning to the next levels are the hot-selling Tabs such as the iPads, Galaxy etc.

Mobile learning involves connectivity for downloading, uploading and/or on-line working via wireless networks, mobile phone networks or both, and linking to institutional systems e.g. virtual learning environments (VLEs) and/ or Learning Management Systems (LMS). It is a field which combines two very promising areas – mobile computing and e-learning. Handheld devices are emerging as one of the most promising technologies for supporting learning and particularly collaborative learning scenarios; mainly because they offer new opportunities for individuals who required mobile computer solutions that other devices cannot provide [18]. Phones, computers and media devices now fit in our pockets and can connect us to a

variety of information sources and enable communication nearly everywhere we go. In recent years, universities have made significant investments in technology systems to support various aspects of student's studies and learning. These include the infrastructure and course management systems. All this work is to attract students into the online environment of the university [2]. Students have come increasingly equipped with newer mobile devices which "push" information to them allowing quick and easy communication and information sharing [6].

Moodle is an open source LMS, based on sound pedagogical principles, which was mostly developed in academic context. It is open to registered users and offers many different functions, ranging from course management to monitoring students' activities; it can be used as a repository for course material, but it also offers the possibility to develop forums, wikis, quizzes, surveys and other interactive in-built activities, without any need for particular computer skills. The main advantage of such an environment is that it is self-contained and all the above described functions are seamlessly integrated on the same platform, thus creating the feeling of being in a classroom – though a virtual one [8]. MLE-Moodle is a plugin for Moodle, which adds m-learning functionality to this open-source e-learning system. The mobile learning area can be accessed with the mobile phone browser or with a special mobile phone application, which is designed for mobile learning. It's been under development since 2003 and to this day provides one of the most flexible and feature friendly mobile experiences. Besides the features provided by Moodle, it has extra features like Mobile learning objects and flash card trainer that are specific to the m-learning environment. Lastly, Moodle provides Language Packs for 80+ languages and translations are available for Hindi, Tamil and other popular languages.

The paper examines the educational benefits and implementation issues in mobile learning, recommend the guidelines for implementing effective mobile learning and discuss the future of teaching and learning with mobile technologies. In this paper MLE-Moodle has been chosen as an example of m-learning. The reason to choose MLE here was that the participants were already familiar with the Moodle environment. Thus, the transition from e-learning to m-learning was easy. The feedback on the ease of use and benefits of MLE and the motivation and readiness of the students towards m-learning was analyzed. The findings of the paper would be useful for any higher education institution that is planning to implement m-learning in its curriculum.

OBJECTIVES

The objectives of the study are the following:

1. To study the motivation and the satisfaction of students from MLE-Moodle
2. To analyze if the students are ready and willing for m-learning
3. To recommend how to implement m-learning, so as to be an effective medium of imparting education in a higher education institute

METHODOLOGY

The study was conducted for a full-time course in a Post-Graduate institute in a metro city. The MLE-Moodle software was installed on the institution's server. The MLE-client was installed on student's mobile phones. The course chosen was Masters in Computer Applications (MCA). Two batches of students participated in the study. These students were already using the Moodle LMS for the last one year. Demonstrations were given to all the participants to make them familiar with MLE, the new plugin. Once the participants gained confidence, the learning part (flash card trainer, notices and messages) and the evaluation part (quizzes) were done through MLE-Moodle. A questionnaire based survey was done to get the feedback of the participants. All the students of the class were given the questionnaire. Statistical analysis was done on the responses to understand the satisfaction from the m-learning tool.

LITERATURE REVIEW

Usually new technologies are embraced on the surface with no deep understanding of their fullest potentials [11]. M-learning being a young field, its impact and capabilities have not been fully explored. It is well known that most computer users exploit only a small proportion of the technology available to them, and that immensely powerful machines are often used as little more than hi-tech typewriters and calculators. It is observed that the mobile phone has been around for a couple of years with little regard to its potential for learning. For an innovation which necessitates technological change and social re-organization, Graham [11] proposes a framework to answer questions such as: what the anticipated benefit of the innovation will be and whether there will be genuine additional benefits; whether the chance of its being implemented successfully is much higher than the chance of its failure; what the cost of its introduction would be in terms of disruption to existing systems that are known, tried and reliable; how stable the circumstance in which the proposed innovation is to be

made; and whether there are recurrent patterns of behavior that would give some pointers to its likely reception?

These questions bear directly on the lives of people for whom the innovation is intended. These questions ought to be answered before undertaking any new technological innovations. IT projects have been undertaken whose results have not benefited the intended users. Care ought to be taken because; in the name of technological improvement, a huge cost in terms of personnel as well as money can be incurred quite pointlessly.

Goh and Kinshuk [10] have cited several M-learning initiatives. These include among others: games-oriented implementation for m-portal [14]; class room of the future [7]; hands-on scientific experimentation and learning [13]; mobile learning system for bird watching [5] and context-aware language learning support system [17]. Through the use of interactive games and contests installed on mobile devices, learners can construct their own knowledge and share among themselves. In the classroom, M-learning integrates with online learning management systems to provide tools for brainstorming, quizzing, and voting. In the laboratory, M-learning supports individual learning as well as collaboration learning. Mobile devices can be of benefit to laboratory environments for data gathering and control. In field trips, mobile devices support learning by collecting pictorial and textual data. Their mobility enables learning to take place in the field. In distance learning mobile devices support the delivery of synchronous and asynchronous learning while in informal settings the devices support incidental and accidental learning [16]. Some pessimists have come out to say M-learning will not work. Keough advance seven reasons as to why M-learning will not work. According to him M-learning as a concept alone is doomed to failure because as a learning model it appears: to be technology driven: we know too little about what mobile devices are used for; not to change entrenched institutionalized education models: cultures of education and communications reflect government control measures; to rely on nascent consumer technology: mobile devices are inherently dissatisfying by never quite meeting every promised need for the consumer; to be short on standards to overcome cultural differences: while standards are slow to emerge Governments are rapidly regulating and limiting the use of mobile communications technology; and lacking teaching and learning models [12].

The future of M-learning is forecasted to be bright. The capabilities of mobile phones, PDAs and smart phones are always on the move to higher ends. Research endeavors in this field are magnanimous [19]. Integrated context-aware capabilities will transform everyday activities by providing the ability to capture details about the time, location, people around you and even the weather. The entire internet will become both personal and portable. Such technologies will have a great impact on learning. Learning will move more and more outside of the classroom and into the learner's environments, both real and virtual and the M-learning is well positioned to champion these innovations. As we progress through the twenty-first century, and the already hectic pace of our lives increases, society will need to find faster and more inventive ways to utilize previously unproductive time [9]. Life-long learning will be essential for maintaining a competitive advantage in the global economy, for personal growth, and for simply functioning efficiently in an increasingly technological environment. These requirements and skills can be improved through the use of M-learning [16].

mLearning Action in India # 1:

Indian GSM operator, Tata Docomo, provides an English Seekho service through its mobile portal, Tata Zone. It allows users to take conversational English language lessons on their mobiles through an interactive voice response (IVR) application that guides the user through audio clips. It offers short lessons followed by interactive lessons which enable users to practice what they have learnt through the mobile's keys or through speech recognition. The subscription fee for this service is Rs 20 per month and call charges are 60 paise per minute. It is available in 24 cities.

mLearning Action in India #2:

Aircel, the fifth largest GSM player in the country by subscribers, offers education related services through its mGurujee application. The app allows users access to content in areas of engineering, management, civil services and medicine; school syllabi of CBSE and ICSE boards as well as skill development, vocabulary and general knowledge tutorials. A user can subscribe to mGurujee and get access to learning content in practice, quiz, timed or tutorial mode. When the user completes a question set or the time is over, the results are displayed instantly. The operator charges Rs 5 per question set and Rs 30 per month for subscription to a question set.

mLearning Action in India #3:

Reliance Communications too has been doing some work on this front through its mobile portal, RWorld. The company first launched an m-education service in 2003 called m-school, where teachers and

parents could access databases of schools and register queries and complaints. RCom provides exam results, career counseling, etiquette and grooming sessions.

ANALYSIS AND INTERPRETATION

Screenshots of the MLE client as seen on the phone browser are shown below. Figure 1 shows the start page for MLE as seen on the mobile phone. Figure 2 shows the message box for the MLE. The inbox, create a new message, archives and contact list is visible in this. Figure 3 shows how to take a quiz. The question and its various choices are shown on the phone browser. The respondent is supposed to select one of the choices. Figure 4 shows the courses that have been uploaded on the MLE. Once the user clicks on a particular course the page similar to figure 5 is opened.

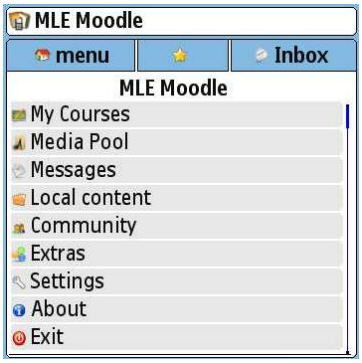

Figure 1: Start Page

Figure 2: Messages

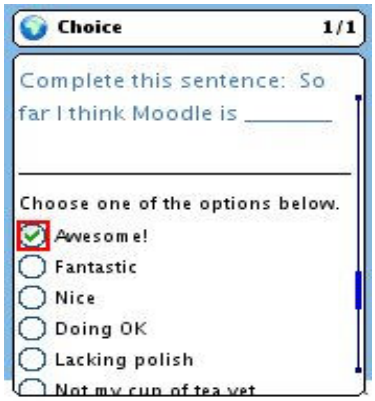

Figure 3: Choice

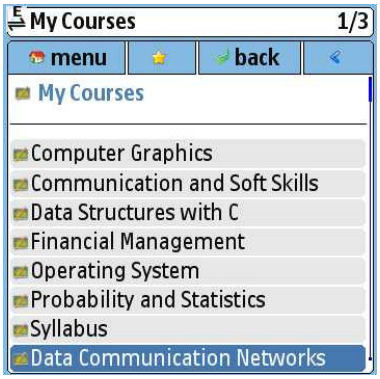

Figure 4: Courses in MLE

Figure 5: Inside a Course

The questionnaire was distributed to 100 students. Valid answers were obtained from 91 students. The most common handheld device among the students was cell phone. It was followed by smart phone, then laptop and finally the MP3 Player. Very few students possessed an iPod, E-book reader and handheld gaming console. The most common activity done using a mobile device was to "Send and receive messages". This was followed by "Transfer photos or other data via cell/smart phone" and "Transfer files via portable storage devices". This means that the mobile device was mainly used for communication and transfer of information rather than reading/learning.

Even though the survey was conducted on 2 batches of students doing their post graduation in computer applications and the way courses are conducted is the same for all of the students, the number of courses they took through Moodle differed. 55% of the students had taken 1-5 courses through Moodle, 25% had taken 5-10 courses and 20% had taken 11-50 courses. This is because, for the courses where faculty did not force the use of Moodle, the students also did not use it. As per the skill-levels of the students, mostly (80%) felt they are fairly skilled in using Moodle. Only 5% felt they are not skilled, 13% felt that they are very skilled and only 2% felt they are experts in using Moodle.

Thus, it can be said that the students have already done extensive work on Moodle and they could be taken to the next level.

Satisfaction from MLE (on an average) from different perspectives was taken from the students. In terms of cost, majority of the students (50%) were dissatisfied, 20% were neutral and 30% were satisfied. Looking at the features MLE provides, 38% students were satisfied with what MLE provides whereas 48% were neutral in their response. As per the speed performance of MLE, 20% of the students were dissatisfied, 49 % were neutral and 31 % were satisfied with it. From usability perspective of MLE, majority of the students (50%) were satisfied. 31 % were neutral and 19% were not satisfied. Considering Security aspects of MLE, number of satisfied and dissatisfied students was the same, 35%. The remaining students were neutral in their response. Thus, it can be said that in terms of features of MLE-Moodle, cost was the major factor where the dissatisfaction was the highest.

Students were also asked to convey their agreement or disagreement toward the following statements after their experience. The table below (Table I) shows the summary of their responses. It shows that the only disagreement was with the statement related to cost of downloading the material. Thus, overall, looking at the responses obtained for all the questions, it was the cost associated with accessing MLE-Moodle on the handheld device which was a hindrance in its use and acceptance. (Table 1)

Table 1: Student's Experience of using MLE

Statement	**Agree/ Disagree**
It was easy to use	Agree
This experience was fun.	Neutral
I would take another mobile learning course if relevant to my learning needs.	Neutral
I would recommend mobile learning as a method of study to others.	Agree
Mobile learning increases the quality of learning.	Agree
Learning objectives can be met by mobile learning.	Agree
Downloading course content was easy.	Agree
Communication with and feedback from the tutor was easy in this course.	Neutral
Mobile learning is convenient for communication with other course students.	Agree
Navigation was easy.	Agree
Evaluation through quiz was effective.	Agree
Mobile learning increases access to education and training.	Agree
The cost of downloading the mobile course material was acceptable.	Disagree
The cost of communicating in the mobile learning course with the tutor and other students was acceptable.	Neutral

When asked about the benefits of MLE, the following responses were obtained (Figure 6). "Convenience" and "Saved time" topped the list of benefits that MLE provides to the students.

When asked about the barriers in using MLE, the following responses were obtained (Figure 7). Its use being expensive topped the list, followed by "No barriers" felt by many students.

Further, the students were asked what should be changed according to them, so that MLE-Moodle gets wider acceptance. Majority were for faster data transmission on their device. Quite a few felt that lowering the tariff would help. Some felt that having more features in MLE would do the trick (Figure 8).

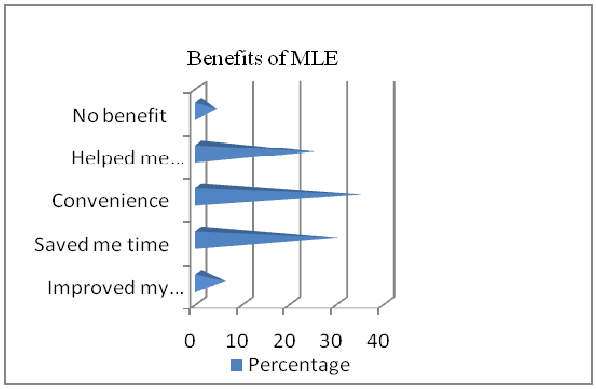

Figure 6: Benefits of MLE

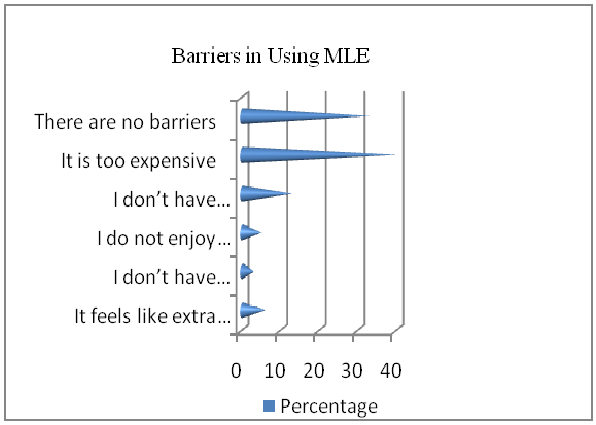

Figure 7: Barriers in using MLE

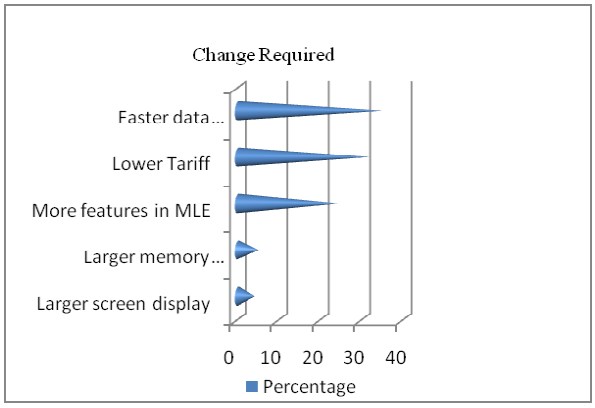

Figure 8: Change required in MLE

Students were then asked, as an overall tool, do they feel that MLE-Moodle was a beneficial educational tool. Only 2% felt that it was not, whereas 9% felt it was a very beneficial educational tool. 89% felt it was an average tool in terms of being beneficial. When asked if they were ready for m-learning, 55% felt they were, whereas 25% were not sure. About 20% felt that they were not ready for m-learning.

Some interesting comments that were obtained from the students were as follows:

Students were ready to spend money on movies and restaurants whereas they were not ready to spend money on accessing internet on their handheld devices. This is because internet connectivity was available free of cost on computers, both in college and at home. They were, therefore, hesitant to spend money on it. Rather they would spend their pocket money on other entertainment options. The reading material uploaded by the faculty is in docx, doc, pptx, ppt format. Their format may not be supported in the device and hence they are unable to view the reading material. They said that it would be better if the reading material uploaded was in the form of text files.

CONCLUSIONS

Today, mobile devices are ubiquitous and they provide a new medium for learning - both formal and informal; and has unique offerings such as just-in-time, just-in-place learning. M-Learning is not about courses, but instead supports a broad definition of learning, including innovation, collaboration, research, design and more, generating new products, services, and problems solved. Whether providing needed tools, augmenting learning, or connecting individuals, mobile is a powerful new tool for supporting performance. So, with the thriving mobiles, ever improving communication technologies, the learning arena is all set to witness a new and powerful means of learning….Mobile Learning.

Summarizing the results from the tables above, it was found that majority of the students have cell phones and some have smart phones and laptops. The students have been using Moodle LMS and are fairly skilled in it. They found MLE-Moodle to be a beneficial educational tool and they are ready for M-learning. They are ready to use the software as it provides them convenience and saves their time, but the majority of the use would be restricted to communicating and data transfer. Actual use for reading and learning may not happen. Their major concern is the cost associated with accessing internet on their handheld devices and the data transmission rate. They may recommend others to take an m-learning course but may not take it themselves again. Overall, the

response was not very enthusiastic. The students felt that they have a lot of cheaper or rather free options available to help them in their learning process. They have PCs at home and in college where the internet is practically free. A lot of books are also available in college libraries for reading purpose. Al; in all, there is no dearth of resources for the learning process, so why spend money on internet access on handheld device for the same. They would rather spend that money on movies and friends! Thus, it can be said that m-learning maybe a better option where basic facilities like, teachers, classrooms, libraries, internet access, PCs, electricity, etc. are not readily available. This seems to indicate that m-learning stands a greater chance of being successful in smaller towns.

The world is dynamic. Technology, cultures, teaching and learning models and methods are not static. M-learning, just like any new field requires time to grow. M-learning cannot be used on a stand-alone basis. It has to be blended with other methods of delivery including face-to-face, print and online learning. The big challenge for educators and technology developers of m-learning is to find ways to ensure that this new mode of learning is personal, collaborative and value-adding; in other words, truly learner-centered learning.

REFERENCES

[1] Android Bot for Moodle, Viewed on 20 Feb, 2011, https://market.android.com/details?id=com.codegui ld.amood

[2] Armatas, C., Holt. D., and Rice. M., "Balancing the possibilities for mobile technologies in higher education", *Ascilite: Balance, Fidelity, Mobility: Maintaining the Momentum,* 2005, pp. 27-35.

[3] Bhattacharjee, S., "Mobile Learning seeks growth curve in India", Viewed on 20 Feb, 2011, http://www.comviva.com/media/Mobilelearningsee ksgrowthcurveinIndia.pdf, 2010

[4] Brown, H.T., "Towards a model for M-learning", *International Journal on E-Learning*, Volume 4, Number 3, 2005, pp. 299-315.

[5] Chen, Y.S., Kao, T.C. and Sheu, J.P., "A mobile learning system for scaffolding bird watching learning", *Journal of Computer Assisted Learning*, Volume 19, 2003, pp. 347-59.

[6] Chuang, K.C., "Mobile Technologies Enhance The E-Learning Opportunity", *American Journal of Business Education,* Volume 2, Number 9, 2009, ABI/INFORM Global, pp. 49 – 53.

[7] Dawabi, P., Wessner, M. and Neuhold, E., "Using mobile devices for the classroom of the future", in Attewell, J. and Savill-Smith, C. (Eds), *Learning with Mobile Devices*. *Research and Development*, Learning and Skills Development Agency, London, 2003.

[8] Fontanin, M., "Developing an English course for in-service librarians; The advantages of blended learning," *Emerland Library Management*. ed. 29, Volume 8/9, 2008, pp. 777-788.

[9] Geddes, S.J., "Mobile learning in the 21st century: benefit for learners", *Knowledge Tree e-journal*, Volume 30, Number 3, 2004, pp. 214-28.

[10] Goh, T. and Kinshuk, D., "Getting ready for mobile learning – adaptation perspective", *Journal* of Educational Multimedia and Hypermedia, Volume 15, Number 2, 2006, pp. 175-98.

[11] Graham, G., "E-learning: a philosophical enquiry", *Education & Training*, Volume 46, Number 6/7, 2004, pp. 308-314.

[12] Keough, M., "7 reasons why M-Learning doesn't work", 2005, viewed on 17 Feb 2011, www.mlearn.org.za/CD/papers/McMillan-Keough.pdf

[13] Milrad, M., Hoppe, U., Gottdenker, J. and Jansen, M., "Exploring the use of mobile devices to facilitate educational interoperability around digitally enhanced experiments", *Proceedings of the 2nd IEEE International Workshop on Wireless and Mobile Technologies in Education (WMTE 2004), Mobile Support for Learning Communities,* Taoyuan, Taiwan, March, 2004.

[14] Mitchell, A., "Exploring the potential of a games-oriented implementation for m-portal", *Learning With Mobile Devices. Research and Development*, Learning and Skills Development Agency, London, 2003.

[15] Moodle., www.moodle.org

[16] Muyinda P.B., "MLearning: pedagogical, technical and organizational hypes and realities", *Campus-Wide Information Systems*, Volume 24, Number 2, 2003, pp. 97-104

[17] Ogata, H. & Yano, Y., "Context-aware support for computer-supported ubiquitous learning", *Proceedings of the 2nd IEEE International Workshop on Wireless and Mobile Technologies in Education (WMTE 2004), Mobile Support for Learning Communities*, Taoyuan, Taiwan, 2004.

[18] Rosman P., "M-learning – as a Paradigm of new form in education", *E+M Ekonomie a Management;* 1; ABI/INFORM Global, 2008, pp. 119- 125

[19] Woukeu, A., Millard, E.D., Tao, F. and Davis, C.H. (2005), "Challenges for semantic grid based mobile learning", viewed on 17 Feb, 2011, www.u-bourgogne.fr/SITIS/05/download/Proceedings/Files /f135.pdf

AUTHOR BIOGRAPHIES

Mahendra Gupta is a post-graduate in Management Studies and a graduate in Physics from Mumbai University, India. He has 15 yrs of work experience in the IT industry in the field of quality management and e-learning with multinational companies and reputed academic institutions. He is currently working as a Quality Manager at Mastek Pvt. Ltd. and is also pursuing his doctoral research in the field of Information Technology from DY Patil University, Mumbai, India. He has presented papers in national as well as international conference in the field of IT Management and e-learning.

Ela Goyal is a postgraduate in Computer Applications from Delhi University, India and a graduate in Physics from St. Stephen's college, Delhi, India. She has 11 years of work experience in the IT industry with multinational companies and reputed academic institutions. Ela has taught various subjects in the field of Computer Science and Information technology at graduate and post-graduate levels. She is currently pursuing her doctoral research work from BIT, Mesra, Ranchi, India in the field of Information Technology. She has presented papers in national as well as international conferences on the use of ICT in management education.