

INTRODUCTION TO E-LEARNING SYSTEM AND
DEVELOPMENT OF MOBILE-BASED E-LEARNING
SYSTEM FOR NAÏVE USERS

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Abstract:

In the beginning of this century, there were around 100 million children out of school who needed to be educated as per the Dakar conference (UNESCO). Reaching them with just 60 million teachers was practically impossible. Even with the efforts of increasing the enrolment rate, as per UNESCO's 2009 findings, there are still 67 million children of primary school age and another 72 million children of lower secondary school age still out of school and the process is slowing down. There needs to be a feasible way for education to reach every uneducated child in the world. With the world moving in the 21st century, Information and Communication Technology (ICT) seems to be the only answer to this problem. While recognizing the potential value of ICT in education, many countries face significant challenges in transforming the promises of technology into tangible benefits for learning. Many of these challenges are related to costs or infrastructural and technical issues, such as lack of access to technology or poor connectivity. This is particularly the case in low- income countries. Other barriers include the lack of relevant content in a language understood by the user and limited access to open education resources. In this paper, we discuss details on E-learning and propose a prototype model of Mobile-based learning for naïve users using Microsoft's Dot Net technology with Unicode character set.

Keywords: E-learning, Mobile-learning, ICT, Unicode, Dot Net, PDA-based learning

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1. Introduction of E-learning

With the growth of the Internet, E-learning has grown exponentially in the last few years. In the early years of 1960s, the first group of scientists concentrated on automating the simple notions of learning and instruction. The migration and adaptation of computer-based instruction, based on mainframes to minicomputer, workstations and personal computers absorbed much of the energy of researchers and developers initially. With each succeeding technological innovation, new capabilities and features were available to enhance the technology supported learning process. As the tools matured and personal computer proliferated, costs dramatically reduced.

The second group of researchers focused on the potential of information-structure-oriented approaches to represent human cognition and learning. Researchers used Artificial Intelligence which led to the development of Intelligent Tutoring Systems (ITS).

In the 21st century, a Knowledge-Driven economy, the Human Resource Systems (HRS), Knowledge Management Systems (KMS) and Learning Management Systems (LMS) are said to be merging into holistic intellectual capital systems^[1].

Definitions of E-learning, a few but not limited to the following:

Definition 1: Tom Kelly, Cisco: “E-learning is about information, communication, education and training. Regardless of how trainers categorize training and education, the learner only wants the skills and knowledge to do a better job or to answer the next question from a customer.”

Definition 2: “E-learning provides the potential to provide the right information to the right people at the right times and places using the right medium.”

Definition 3: Learning Circuits1: “E-learning covers a wide set of applications and processes

such as web-based learning, computer-based learning, virtual classrooms and digital collaboration. It includes the delivery of content via the Internet, Intranet/Extranet, audio and videotape, satellite broadcast, interactive TV and CD-ROM.”

Definition 4: Rosenberg: “E-learning refers to the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance.” Rosenberg claims that E-learning is based on three fundamental criteria:

- E-learning is networked; hence instant updating, storage and retrieval, distribution and sharing of information is easily possible.
- E-learning is possible for the end-user via any computer-based device using standard Internet technologies.
- E-learning focuses on a broad view of learning; learning solutions going beyond the traditional paradigms of teaching and training.

2. Types of E-learning

As per Namahn^[2], E-learning can be classified based on the degree of interactivity required for each.

Tier 1 learning	Tier 2 learning	Tier 3 learning
Low interactivity:	Moderate to high interactivity:	High interactivity:
mainly text, multimedia or		includes learner to learner
PowerPoint presentation, learning on a Personal Digital Assistant, E-books, Podcasting, Videotape, Audiotape, CDs / DVDs, Radio.	Interactive resources, quizzes, tests, reflective learning, games, simulations, demonstrations.	Virtual classrooms, streaming media, group games, videoconferences, audio conferences, chat groups, emails, discussion lists.

As given in [3], the E-learning can be classified as Online, Video, Television, Videoconferencing etc.

According to [4,5], there are fundamentally two types of E-Learning:

1. Synchronous training

2. Asynchronous training

Synchronous, meaning "at the same time" or "simultaneously", involves interaction of participants with an instructor via the Web in real-time. For example – Virtual class rooms (VCR) that are nothing else but real classrooms online. Another example would be of EduSAT's initiatives in India. Participants interact with each other (in a limited way) and with the instructors through instant messaging, chatting, audio or video conferencing etc and what's more all the sessions can be recorded and played back. The benefits of synchronous training are:

- Ability to log or track learning activities.
- Continuous monitoring and correction is possible.
- Possibilities of global connectivity and collaboration opportunities among learners.
- Ability to personalize the training for each learner.

Asynchronous, meaning "not at the same time," allows the participants to complete the training at their own pace, without real-time interaction with the instructor. Basically, it is information that is accessible on a self-help basis, 24x7. The advantage of this kind of E-Learning is that it offers the learners the information they need whenever they need it. It also has interaction amongst participants through their message boards, bulletin boards, discussion forums and

blogs. These include Computer-Based Training (CBTs), modules on CD-ROMs, Web-Based Training (WBTs) accessed through Intranet or through well written articles and other write ups. Its advantages are:

- Available 'just in time' for instant learning and reference.
- Flexibility of access from anywhere at any time.
- Ability to simultaneously reach an unlimited number of learners.
- Uniformity of content and one-time cost of production.

3. **Major advantages of E-learning are ^[1]: No need for travel**

- Alternative training mode from off-site personnel and trainers.
- Instructors are not held by geographic boundaries.
- More students can view a presentation at once.

Shorter Development Cycles

- Faster delivery of appropriate training.
- Higher rates of student completion than found in self-paced training.
- A more efficient mode of offering penetrating data.
- Flexibility to modify or change content and to make it accessible on demand.

Cost Savings for the Corporations

- Reduction of internal training costs.
- Reduced time away from work for participants.
- Students retain knowledge better.
- Provides a tool for optimum inter-communication and data compilation.
- Dramatically reduce travel costs.
- Flat fee pricing structures give organizations unlimited access to training for one year.

4. Major Disadvantages of E-learning ^[1]:

- **Bandwidth limitations.** Limited bandwidth means slower performance for sound, video and intensive graphics, causing long waits for download that can affect the ease of the learning process. Future technologies will solve the problem however.
- **Loss of human contact.** There is a general concern that as we move towards more computer usage, a terminal will replace a friendly face. Gradual introduction of E-learning or the use of blended learning may be the answer to this concern.
- **E-learning programs are too static.** The level of interactivity is often too limited.
- **E-learning systems take more time and more money to develop than expected.** This is indeed the case, as it is with any new technology that is implemented. It is easier by starting with an easy program and building on success.

- **Not all courses are delivered well by computer.** Some training topics are not best served by CBTs and require a more personal touch. Team building issues and dealing with emotional issues are two examples.
- **Quality of learning.** Progress in the field of E-learning has been relatively slow when compared to other 'fields'. A lot of web-based systems are worse than systems that were developed 15 years ago. Still, focus is often on how to develop a lot of courses and not on how to improve the quality of learning.
- **Resistance to change.** Introducing E-learning initiative in an organization is not an easy-to-do task. Resistance may be hard to overcome, lack of communication and commitment from champions within the organization may jeopardize the chances of a succeeding E-learning initiative.
- **Confusion about technology.** The use of the right technology can enhance learning. With a lot of technology available, sometimes lesser opportunity technologies are implemented with dire consequences.
- **Focus on syllabus and courses, not on learning.** Most of the focus of ICT-based learning is on the syllabus of the schools and the requirements of the schools; thus, restricting the very opportunity of growing beyond books and beyond classrooms.

5. Proposed System

In the current era of technology, the usage of mobile devices has expanded dramatically. Mobile devices such as Cell phones and PDAs have become so widespread that people now have begun to think about implications of using these devices to teach or to assist the naïve users of English language. In this paper, we present our ideas about the opportunity that exists in the field of technology to impart the knowledge of English Language, which is most commonly

used by people (Naïve users of English language), through the handheld devices such as Mobile / Cell phones which are so pervasive today in the society. The scope of this system facilitates the users to display a sentence in English language for the selected common sentence in Gujarati language thus aiding the users of Gujarati medium to learn English language^[6].

This system helps the users by providing some of the commonly used Gujarati sentences according to the different categories devised, based on major public places, the places of people interaction. In this system, user has to select the category/common place from the list. On selection of category by the user, the system will display the list of commonly used Gujarati sentences to the user. The user can select the Gujarati sentence for which he or she needs an equivalent English Language sentence. On selection of Gujarati sentence, the system will display the required English Language sentence on screen as shown in Figure-1 and 2.

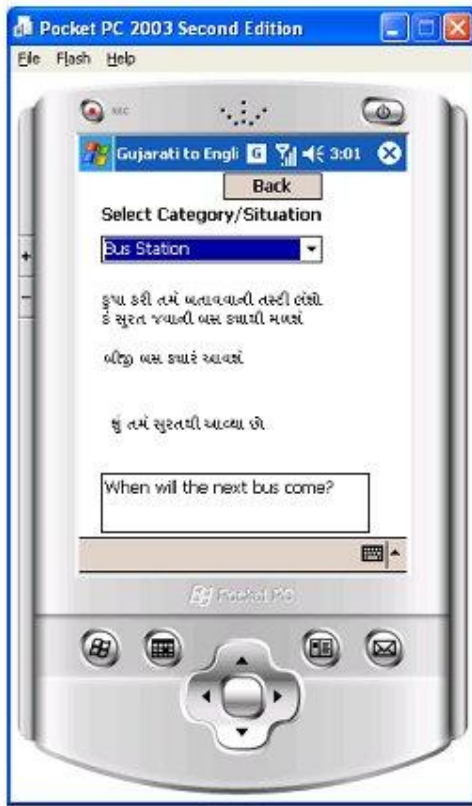


Figure - 1

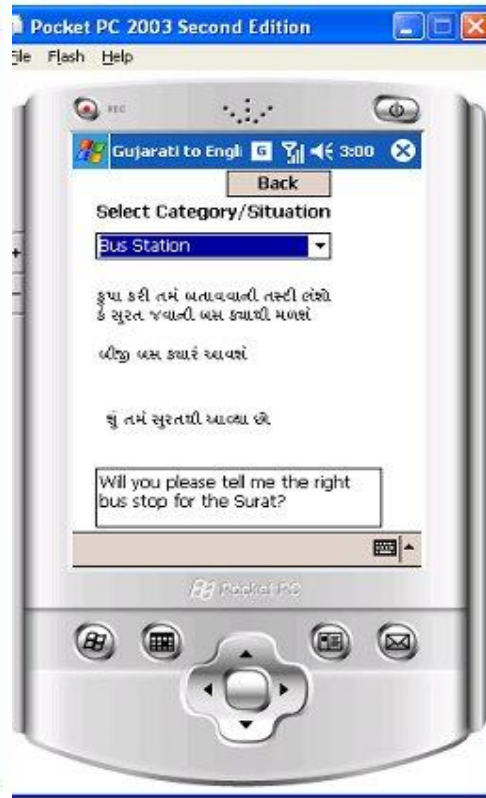


Figure - 2

6. A Detailed Methodology of the Proposed System

Presently we have implemented the partial application prototype using the Microsoft's Dot Net Architecture along with Unicode character code standard. Dot Net Architecture provides a Rapid Application Development environment and a special support of compact framework for mobile devices including the simulators for the same. The Unicode character code is useful to develop a multilingual application. For the development of a multilingual system on ICT devices, it needs to use either font based technology or Unicode. But a font based technology is not uniform and not standardized across the world and so to develop a true multilingual application one must use Unicode. As the earlier character codes such as ASCII and EBCDIC

were 8-bits code, they could support a maximum up to 256 different characters. Hence, it cannot be used to support alphabets of all the major languages used by the people across the world. So, computer researchers have been invented a new 32-bit character code, called Unicode that can support symbols (alphabet) of all the major languages of major countries.

For our prototype, we have taken the Microsoft's native Database SQL Express. In this database for every place/category we have a set of three Gujarati-based sentences and its English equivalent. The application is developed for mobile phones only. It must be downloaded and installed in you mobile hand-set which supports for graphics applications and Dot Net architecture.

7. Conclusion and future Work

This system will help the mobile users to learn English on the move for a relatively small amount of places. The drawback with the current prototype is that it uses proprietary software and database. Since the current trend is to have 'data on the Web', this database will not be usable by any other application or anyone else. To make it available, it must be represented in a format that supports knowledge representation for the web. There are many standard languages like eXtensible Markup Language (XML), Resource Description Framework (RDF) and Web Ontology Language (OWL) available from World Wide Web Consortium (W3C) which support this representation. Our Future work would be to convert this database into a platform-independent format so that users on the Web can use it as well as contribute to it and thus expanding the knowledge-base. Future scope for our work can be to make users learn any language from any other language.

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