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MLEARNING FOR INDIA: ANY POTENTIAL?

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ABSTRACT
The trend towards mLearning is attributed to the growth of knowledge based societies (UNESCO, 2005). In this paper, we examine if there is a case for mLearning in India, a developing nation with certain unique contributory factors such as rapid diffusion of mobile communication technologies negating the need for fixed line infrastructure; and the rising demand for flexible learning approaches by the eager, upwardly mobile, middle class population. Our research is informed by learning theory of constructivism that seems to underlie flexible adult learning in modern contexts. A speculative ongoing debate is examined through the lens of critical discourse analysis, to present an outlook for India. We open a launching platform for empirical work in India that would enable building of relevant models by extrapolating findings from this initial research. More significantly, the stakeholders in mLearning such as mobile technology/service providers, education providers and organisations that foster staff development in particular may be beneficiaries from the findings of this preliminary research.

KEYWORDS
MLearning, eLearning, India, Developing nations, Constructivism, Discourse Analysis.

1. INTRODUCTION
A recently published UNESCO World report (2005) traces a trend towards knowledge societies in the world and emphasizes this third global revolution created by new information, communication technologies. The simultaneous growth of Internet, mobile telephony and digital technologies has been cited as the technological breakthroughs that have not only facilitated this trend, but have also shifted the learning paradigms in the working population. In developing economies, these technologies held a special appeal as they have offered a way of catching up with the developed world by skipping stages in industrial development, through the concept of technology leapfrogging. However, the trend towards knowledge societies is uneven due to the disparities among population within economies and across economies (UNESCO, 2005:21, 31).

Nevertheless, there is a significant move towards lifelong, adult learning – as the sufficiency of one single specialisation for life is now debatable. ‘...the demand for knowledge will be in terms of ever-recurring needs of re-skilling’ (UNESCO, 2005:59). Keegan (2003) in his landmark treatise in distance learning comments that eLearning is the forerunner to mLearning and that eLearning became the state-of-the-art technology in education within the short span of 1995-2000. By the year 2000 wired telephones/computers were beginning to be replaced by wireless ones. This trend offers critical dimensions as it frees the learner from having to be seated in front of a fixed computer screen. From such dimensions was born the concept of mLearning - the provision of learning on wireless and mobile devices, which eliminates the constraints of time and space (Qingyang, 2003). Grissino and Singh (2004) presented a synthesis of trends that brings mLearning into spotlight. Among the world’s working population, 50% of people spend half their time outside their offices. Conversely, multipurpose handheld devices such as
PDA/telephone are expected to outsell laptop/desktop computers combined, and wireless Internet subscriptions are set to exceed more than 1 billion subscribers by the end of 2005. An IDC survey in 2004 indicated a surge in the market for Pocket PCS worldwide (IDC, 2004). According to ITU statistics, in many economies, mobile communications have overtaken fixed line communications (ITU, 2004). It is imperative that with the trend towards knowledge-based societies with mobile workforce that demand flexible, lifelong learning which fosters career development, mLearning has considerable potential as a future paradigm.

This paper is set in the context of developing nations and focus on India. Due to poor infrastructure, low literacy rates and slow diffusion of information communication technologies -- mLearning is an emerging concept in developing nations as some studies seem to indicate (Brown, 2005, Barker et al., 2005, Masters, 2005). There is also limited research on the potential of wireless technologies in developing nations (Barker et al., 2005). However, these studies do not represent the nation such as India with some unique characteristics. Capacity building encouraged by the government (UNESCO, 2005) has led this country to produce the highest number of basic graduates in the world. These not only enter the domestic and international workforce, but also form part of the service sector in world economies (BPOIndia, 2005). In order to combat illiteracy variance among the population, government is searching new paradigms and technologies (Singh, 2000). There is high contrast between literates who form 50% of the economy as against the neo-literates/illiterates who form the other 50% (see discussion section for further details). The demand for flexible modes of learning for career development, without compromising on a steady income, has become apparent. Supporting these aspects is the widespread adoption of mobile communication facilities which have overtaken fixed line infrastructure in the country (COAI, 2005). And there is only fragmented commercial research regarding mLearning (see for example, Gunukulonline, 2005). This strongly justifies our research.

However the limited scope may be noted as there is little literature available for empirical analysis. We have constructed this preliminary research based on ongoing debates, statistics and other related documents. The contribution of this paper is two fold. For academia, it offers a preliminary platform to launch further research for studying the potential of mLearning within India, as well as building a model that may be applied to developing economies or perhaps other economies in general. Conversely, relevant industry stakeholders could leverage the unique potential of mLearning in India due to the high volume market it presents. In addition, they may be able to use the contributing factors to mLearning in other economies, to build markets. Thus, the paper seeks to inform academic theory and industry -- making a preliminary, yet substantial contribution. The paper is organised as follows. This section which introduces our theme and justifies the motivations is followed by a section that presents the theoretical framework and methodology. The subsequent section presents our findings with an analytical discussion. Further, an outlook is presented with possible best practices for India and offering a platform for launching empirical research by academics in this area where little systematic research has been published.

2. THEORETICAL FRAMEWORK AND METHODOLOGY

In this section, we present the philosophical approach that forms the backdrop to our analysis, learning theories used to inform this research, and the questions that drove our research together with justifications. Contextual teaching and learning has been identified as a paradigm that helps teachers relate the content of their topic to real world situations, motivating students to make connections between knowledge and their lives (CTL, 2000). The relevance lies in its ability to translate knowledge into real life contexts, almost immediately. Some related themes as cited by Berms and Erickson (2001) are also relevant (see also, Resnick and Hall 1998). Knowledge based constructivism is a way in which direct instruction and constructivist activities can be compatible and effective in the achievement of learning goals. Effort based learning/incremental theory of intelligence establishes that people’s aptitude can be changed with increased efforts, as striving for learning goals motivates the person to be engaged in activities with a commitment to learning. Socialisation is a process of learning whereby questions are raised and challenges accepted in order to find solutions that may not seem apparent together with a justification for seeking this information. Situated learning is when a range of settings are used depending on the purpose of instruction. Distributed learning makes sharing knowledge an integral process of learning. Symbols that convey meaning or artefacts become relevant in this theme. Given the above constructs, the many facets of contextualism that links back to constructivist philosophy seemed most suitable for our research context.
When considering a suitable approach for the actual analysis of our findings, we found that the post modern approach of critical discourse analysis (see Locke, 2004; Blommaert, 2005) to be relevant. Palmquist (2001) who applied this approach to information sciences, characterised it as a way of approaching an issue, by deconstructing reading and interpretation of the issue or text available. However, as Palmquist (2005) points out, ‘...discourse analysis does not provide definite answers; it is not a "hard" science, but an insight/knowledge based on continuous debate and argumentation’. Yamaguchi and Harris (2004) applied this approach to analysing the economic hegemonisation of Bt cotton discourse in the Indian context. Dominant shifts over time from governmental process to economic impact emerged as a result of the analysis (Yamaguchi and Harris, 2004). Inspired by the valuable results of this analysis, we chose this approach, by also noting that that there is not yet sufficient empirical data available for other approaches in the Indian context. Conversely, there is only limited extrapolation possible from earlier studies conducted in other developing nations, as provided below.

Masters (2005), while presenting a realistic view of mLearning in developing nations, points out two crucial factors: mobility – especially users’ need for mobility – and the ubiquity of technologies in the societal context, that contribute much to the development of mLearning in developing nations. In a similar context, Brown (2005), while presenting a roadmap for mLearning in Africa emphasised accessibility, as mLearning had the potential of making learning more accessible than eLearning in a developing nation context. Furthermore, the role of communication and interactions in a society facilitated by mobile communication technologies, as compared to the limitations of a fixed infrastructure is highlighted. The aspects of portability, collaboration and motivation are emphasised by Barker et al (2005) who also examined mLearning in the context of Africa. However, these studies have limited relevance to the Indian context due to its uniqueness. However, we have used the critical discourse analysis method in conjunction with the possible general applications of crucial factors in mLearning identified by these researchers – in a tandem analysis to draw the best practices for India, as presented in the conclusions. We now present the broad questions that lead this research:

a) Is the existing environment in India conducive to mLearning?
b) What are the contributing factors and inhibitors (if any) for mLearning diffusion in India?
c) Is there a real potential for mLearning in India?

The next section is aimed at initially presenting the discourse in the context and then deconstructing it to derive meaning followed by possible applications from prior research (as presented in this section) in the Indian context.

3. DISCUSSION

3.1 Deconstructing the Indian context – towards mLearning

To understand the potential of mLearning within Indian context, a brief overview of the related socio-economic context is now presented as deconstructed through discourse analysis. At the outset, we found an interesting paradox. India is the world’s second most populous nation in the world, housing a third of world’s illiterate population, as well as the world’s largest number of graduates.

As of the year 2000, statistics reveal that every second illiterate person in the world lived in India (Worldlit, 2005). Overall adult literacy rate in India is 50%, specifically, men’s literacy rate is 64% while women’s literacy rate is 35% (Economic Times, 2004). One third of world’s non-literate population resides in India (Singh, 2000). Ironically, BPO India (2005) revealed that India is the favored information technology and business process outsourcing destination of the world for big multinational corporations. This raised the big question ‘Why India?’ and the answer presented by BPO India (2005) is ‘...India is home to large and skilled human resources...India produces the largest number of graduates in the world...besides being technically sound, the workforce is proficient in English...’.

This understanding brought us to a second question: How did this interesting paradox come about? A brief look into the historical developments provided further insights. As per the 1951 census which was the first one in independent India, only 18.33% of the population was literate. This figure has increased over the years to 52.21 percent in 1991 and 65.38 percent in 2001 (Ramachandran, 2004). We examined the
progressive history of methods to eradicate illiteracy in the economy. During the first Five Year Plan, the program of Social Education, inclusive of literacy, was introduced as part of the Community Development Programme in 1952. With the contribution of primary teachers and focusing on villages, the program was more focused on children as it was assumed that adult literacy would automatically become universal as soon as the compulsory elementary education became a reality. However, the program itself weakened and was finally abandoned. The Kothari commission who then took up the cause of educating India realized that there needs to be a balanced approach including an emphasis on adult education, if the literacy figures were to rise. (DEI, 2006). The National Literacy Mission was set up in 1988, which included varied campaigns and awareness programs. The programs succeeded in mobilizing entire communities into believing that literacy is a cornerstone for their future. There were several thrusts in the new integrated approach to government policy – namely, addressing the gender gap in literacy, post literate continuing education and lately, creation of a learning society – which is the most formidable one (DEI, 2006). A recent amendment in the constitution has made education a fundamental right for children and has aimed at including all children from birth on in the literacy scheme (Gurukulonline, 2005). Conversely, a continuing education program was launched in 1995 and continuing education centres were set up for a population of 2,000-2,500 aimed at catering for 500-1000 neo-literates. A nodal continuing education was to be set up for a cluster of 10-15 continuing education centers (DEI, 2006). With much funding from government, World Bank, voluntary institutions, it would seem that the total literate society should not be far from becoming a reality. However, the biggest challenge facing the education department in India is to address the population growth. Since the 1950s, every decade the rate of increase in population has been over 20% (for example, between 1991-2001 India’s population rose by 21.34%) India’s population is expected to reach 1.4 billion by 2025 and 1.6 billion by 2050, overtaking China as the world’s most populous country in 2030. The question is, how much of this population will be literate? What will be the proportion of educated middle class?

While literacy campaigns and projects have been fairly successful, the demand for school places as well as for adult education has increased. The current tradition of school/college based education is not really able to meet the needs of the critical learning group aged 18-32 roughly estimated as 350 million (Gurukulonline, 2005). The rise of neo-literates as a product of successful adult literacy programs cannot be ignored. This population also now contributes a fair share in the society, between the literate and illiterate masses, and is aiming to catch up with their literate, professional contemporaries in the society, grouped as middle class. In retrospect, Das (2001) pointed out the significance of middle class in his commentary, India Unbound: ‘The most striking feature of contemporary India is the rise of a confident new middle class. It is full of energy and drive – and it is making things happen. That it goes about in an uninhibited, pragmatic and amoral fashion is true. It is different from the older bourgeoisie, which was tolerant, secular and ambiguous. The new class is street smart...it has had to fight to rise from the bottom and it has learnt to maneuver the system’. While in 1984-1985 the National Council of Applied Economic Research India reported less than 10% middle class in society, the country had more than tripled this number in 2001 (Das, 2001).

It could be well said that the paradox has come about with the unbalanced literacy policies that ignored adult learning to a certain extent. Towards late 1980s adult learning became a thrust in the south western states of India. While the mass population resides in the north eastern states, where government is trying harder to ensure child literacy and empowerment of women, leading to literacy overall, the more literate population in the south western states are demanding lifelong, adult learning. The existing infrastructure of schools and colleges are definitely not able to cater to the masses. Yet again, there are two different groups in this area: the first belongs to the educated, middle class youth, who are already in the workforce, but are looking for career growth. The second group is the neo-literate adults who as part of the literacy programs have moved into vocational professions, but are also upwardly mobile, seeking growth opportunities. There is no doubt that the need is apparent. However, in a social system where education is still regarded as a concept of youth, the case of adult-centric, lifelong learning is still an unfamiliar paradigm and will not easily be adopted by masses. In retrospect, in the years prior to independence or even short after, it was only in a few southern states where the concept of ‘night schools’ aimed at adult education was encouraged (DEI, 2006).

We considered the social context that encouraged eLearning at this stage. Traditional education in India was in such a state that by the age of 24, education is completed with a graduate emerging from a university with one specialisation for life. With the turn of the century, the concept of lifelong learning, especially within the workforce where a 40 year old seeks to further a career by multiskilling, has come into existence. This required a paradigm shift in the learning processes in place, as even the part time or evening colleges
were not able to cater to the high demand. A McKenzie report indicated that by 2008, there is a need to
develop 2.2 million information technology based workers by 2008 in India (Gurukulonline, 2005). India has
positioned itself in the world as a service economy as it produces the largest number of IT graduates that
support business process outsourcing from developed nations. This requires continuous multi-skilling of the
existing workforce. There should also be alternate methods of learning for a society which is currently not
able to sustain the demand for education. Here is where the concept of eLearning may become prominent. As
a concept eLearning is still in the early stages around India with few organisations such as NIIT, Tata
Interactive Systems, Mentorix and so on are competing for providing global eLearning which is estimated to
be almost 25 million dollars with a growth rate of 17-18% annually (Kumar, 2005).

We now consider the first research question, is the environment conducive to mLearning India? It would
seem apparent that it is. First, the spread of the Internet has been rapid over the past 10 years. While the
affordability of a PC is perhaps still questionable for an average citizen, the growth of Internet cafes
throughout the country, enabled by government policy, has almost negated the need for individual
infrastructure. ELearning is rapidly being absorbed as an alternative educational paradigm. This brings us to
the mobile technologies that will support mLearning. With telecom liberalisation and the diffusion of third
generation, low cost mobile communication technologies, mobile telephony has seen tremendous growth as
compared to fixed line infrastructure which are increasingly irrelevant. As per ITU (2006) statistics, in the
year 2004, 51.8% of the total telephone subscribers were also mobile subscribers. There were approximately
48 million mobile subscribers at the end of 2004. In the month of January 2006 alone, 4.7 million mobile
subscribers were added in India. (NEAsia Online, 2006). The mobile service rates are now amongst the
world’s lowest with a peak rate of 2 cents per minute. In the meantime, wireless carriers have spread their
network over rural, semi-urban areas poised to leverage the next wave of growth (NEAsia Online, 2006). The
keys to success for these providers would be to add new subscribers at a rapid pace at a low acquisition cost.
On the other hand, manufacturers of mobile phones also have tremendous potential to offer unique handsets
with low costs, software that works in multiple local languages etc. Subscriber growth and phone demand in
India is expected to continue, with falling handset pricing. (NEAsia Online, 2006).

We now consider the move towards knowledge based societies, especially triggered by the rising
workforce in technology professions within India. In June 2005, the National Knowledge Commission, was
constituted (PIB, 2005) which stated that it will ‘...advise the Prime Minister on how India can promote
excellence in the education system to meet the knowledge challenges of the 21st Century...how it can be
made more widely accessible in the country for maximum public benefit’. Conversely, the World Bank
report (2005) comments: ‘To create a sustained cadre of knowledge workers,’ India needs to make its
education system more demand driven to meet the emerging needs of the economy and to keep its highly
qualified people in the country’ (World Bank, 2005). The report stresses that the government should aim at
promoting the use of ICTs by increasing the access and availability of mobile based Internet technologies and
related applications.

Summarizing this section, we have aimed at deconstructing key/varied stakeholder views, statistics and
facts in order to build a case for mLearning in India, thereby revealing its potential to the relevant
stakeholders.

3.2 Application of theories and themes from related work

In this section, we consider the learning theories presented in the theoretical framework and their
applicability in the Indian context.

The need for contextual, flexible and adult learning, by the rising middle class professionals, and the need
for eradicating illiteracy on the other end of the spectrum, is apparent. From a theoretical perspective,
mLearning concepts that foster Effort based learning/incremental theory of intelligence are important. Peoples’ aptitude can be changed with increased efforts, as striving for learning goals motivates the person to
be engaged in activities with a commitment to learning. Supporting this objective could be a socialisation
process whereby questions are raised and challenges accepted to find solutions that may not seem apparent.
People should also be able to justify the need for seeking this information. This theoretical framework may
be rather useful for the government and non government organisations involved in literacy programs.
Distributed learning which makes sharing knowledge an integral process of learning to address the needs of a
young professional workforce, as symbols that convey meaning or artefacts become relevant within this
group. Drawing on these theories of contextual learning and constructivism, we argue that the theoretical frameworks when applied to mLearning have the potential to address the two critical groups that constitute the population in general.

Now we consider related work and its applicability in the Indian context. Masters (2005) presented a realistic view of mLearning in developing nations in the context of South Africa. In this model, two crucial factors were highlighted. The first factor was mobility. The users should not simply be mobile, but would need the mobility. Specifically, the author proposed that in that context, connecting students via computer laboratories was the best solution -- which was neither convenient nor cost effective. Reaching out to a student via low cost mobile technologies would then perhaps would be more feasible. The next factor the author pointed out was ubiquity of technology. Here, the early generation mobile phone was the only contender for ubiquity. Again, in a 2004 survey it was revealed that more than 95% of the Faculty's students had cell phones, but there were no figures for penetration of PDAs. According to Masters' (2005) model, broad education needs, costing needs and reliability needs have to be considered to manage expectations of the students. When we apply this model in the Indian context, some aspects become relevant. For example, the broad education needs, costing needs and the reliable performance of the technology itself have to be considered in the Indian context, addressing both population groups in context. Conversely, the need for mobility is being felt by the demanding literate middle class population. On the other hand, anonymity offered by the mLearning technologies could be the motivating factor for the neo-literate population. While mobility and mLearning is almost accepted by these groups, thereby changing an earlier mindset, the rest of the illiterate adult population should be made aware of its usefulness. When we consider the ubiquity of technology, mobile phones for example, have been rapidly diffusing into society. Unlike other developing nations, cheap availability of software for mobile devices as well as handsets is almost facilitating ubiquity in the Indian context.

In a similar context, Brown (2005), while presenting a roadmap for mLearning in Africa emphasised accessibility. This is important as mLearning had the potential of making learning more accessible than eLearning in a developing nation context. Furthermore, the role of communication and interactions amongst the society which is facilitated via mobile communication technologies, as compared to limitations via fixed infrastructure, is also highlighted. Applying these findings in the Indian context, we find that it is indeed true as is becoming apparent by the rapid diffusion of mobile technologies and eLearning. Brown (2005) discussed an enhanced form of mLearning is via communities of practice (COP) which is also relevant in the Indian context. Non governmental organisations (NGOs), voluntary organisations and village based forums form COPs in the Indian context. As is revealed from related statistics by the Department of Education in India, these groups have been instrumental in promoting alternative methods to learning, including eLearning/mLearning in a move towards fostering a knowledge based society. The COPs may also be the classified middle class technology professionals, who are also instrumental in developing mLearning technologies and practices to further their career progression.

The aspects of portability, collaboration and motivation are emphasised by the model presented by Barker et al (2005) who also examined mLearning in the context of Africa. Motivation referred to the 'extent to which the mLearning environment motivates learners to engage with their learning and encourages teachers to develop innovative ways of using the devices to complement traditional teaching method'. According to the researchers, an evaluation should determine whether mLearning motivates and fosters the collaboration of all stakeholders and in the Indian context, the motivation and collaboration seem apparent. Referring to portability of the devices - the extent to which they enable mobility of the learners - we consider this example. A neo-literate who has become a employed in a corporation as a result of vocational training and work experience, may wish to further career prospects through higher education, but would be unwilling to go into a university to study on campus, even at night. The reason is the social stigma associated with an adult in a professional career, being seen at a university, with other young students. MLearning provides certain degree of anonymity. Portability of devices makes it furthermore appealing.

Having applied the models from related studies to our context, we briefly look at contributors and inhibitors. Much of the need for mLearning is due to the demand for alternative learning methods by the literates aimed at career progression and the government who seeks to address illiteracy and foster a knowledge society. The availability of cheaper mobile devices and software are also contributing factors. Conversely, mobile phone diffusion that will form the backbone also seems rapid. So what could be the inhibitors? The key inhibitor is the current social mindset. This is a slow process. Adding to the difficulty of government, NGOs and voluntary organisations is the actual rise in the population which is not literate. It is a
continuous process of trying to address both sections at the same time. Having considered all factors, we argue that there is definitely a case for mLearning in India. However, what will be its immediate future? At this stage, we can only speculate on this aspect as lower cost based mobile technologies are still being introduced, and have not yet been able to cope with the existing demand. The next section provides our views derived from this discourse analysis towards best practices in mLearning for India.

4. OUTLOOK

Clearly from our analysis, the potential for mLearning in India is high. Advantages include addressing the needs of rising middle class professionals in lifelong learning, and the ongoing issue of educating the illiterate population, thus positioning itself as a knowledge based economy amongst the world nations. The main inhibitor that emerged was to address the sheer volume of demand and changing the societal mindset towards alternate method of learning such as mLearning. From these summaries we derive a few best practices for diffusion of mLearning in India:

- The government and related agencies who have been instrumental in turning around the literacy problem at grass root levels need to instil confidence in the minds of people (mostly neo-literate and illiterate masses) that mLearning based qualifications are recognised as much as the school or university based education. Conversely, making these qualifications acceptable as part of progression into government based job allocations could be a stepping stone.

- The middle class professional youth who now constitute the literate mass should foster a culture that accepts mLearning as a paradigm by promoting this education within corporations. The wider acceptance of these learning practices would enable faster mLearning diffusion faster into the societal fabric, also offering life long flexible modes of adult centric learning.

- A critical discourse addressing technology based inhibitors could be initiated by the literate masses, technology providers and other related stakeholders. This could include debates on how to provide accessibility to low cost mobile technologies to the masses, also considering equitable revenue for service providers/manufacturers, fixing bugs within existing mLearning software to enable better learning processes and so on. While mLearning providers and technology professionals together with service providers could initiate these nationwide debates or discourse, the government, especially the newly established Knowledge Commission could be linked into this process.

- Manufacturers of relevant technologies should be aiming at providing low cost, yet relevant solutions aimed at both ends of this mass market.

Given the limitations of this unique economy in which the population of literate and illiterate population currently stands at almost a 50:50 ratio, the applicability of the best practices to other developing nations is perhaps limited. Nevertheless, some of the contributions made by the stakeholders in this progression may very well be a learning experience for other nations. The notable high potential of mLearning technologies would be of interest to manufacturers and industry forums involved while for academic research, it proposes a challenge to build newer models that suit the two disparate population groups within the nation. We propose to conduct an empirical study that will trace the diffusion of mLearning in the Indian context – considering not only technologies but also to develop newer learning theories that accommodate the move worldwide into knowledge-based economies. The real interesting challenge would be to observe the progress of mLearning and assess whether it really facilitates the progression of India towards becoming knowledge-based economy.

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