ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN HIGHER EDUCATION - A STUDY

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ABSTRACT

Information and communication technologies (ICTs) are important tools for delivering education around the world. ICT plays a very vital and significant role across the whole world in every aspect of human activity. This emerging technology not only has a key role in education and training but has also enhanced scope for sharing knowledge all over the globe. ICT has given education a whole new meaning as this evolving technology has already challenged stereo typed and conventional way of educational system. As knowledge is considered to be the primary root for the development of a country in every sphere, ICT plays a very crucial role in shaping of students for information rich life. ICT has completely transformed the education scenario as the learning process today has become more interesting and creative for the students who can learn their lessons in more collaborative and interactive environment. ICT provides unlimited resources to the students. Today the students are facilitated with global interactions provided by the Information and Communication Technology which helps them to come out of the monotonous routine work. Actually today's education system has completely got a new makeover by the impact of ICT as teacher centered teaching has been transformed into student centered learning. ICT has a major role to play in formal and non-formal education which is very much beneficial not only for the students and parents but for the universities also. This paper attempts to highlight the role of ICT in higher education and also to find out the challenges and barriers to the implementation of ICT in higher education. In particular this paper has to evaluate the advantages of using ICT in higher education. Thus, the paper suggests that ICT in higher education is not a technique for educational development but also a way of socio-economic development of the nation.

Keywords: ICT, Higher Education, Emerging Technology, Evolving Technology, Learning Process.

INTRODUCTION

Higher education plays a pivotal role in the development of a country, as it is viewed as a powerful means to build knowledge based society. India's higher education system is the third largest in the world, next to the United States and China. As knowledge is considered to be the primary root for the development of a country in every sphere, Information and Communication Technology (ITC) plays a very crucial role in shaping of students for information rich life. ICT has also completely transformed the education scenario as the learning process today has become more interesting and creative for the students who can learn their lessons in more collaborative and interactive environment. Information and Communication Technology provides unlimited resources to the students. Use of information and communication technology in the field of education is to integrate

technology for effective and efficient teaching and learning processes. ICT integration in education impacts learning and teaching pedagogies efficiently and better learning outcomes are observed. It is generally believed that ICT can empower both teachers and learners. It promotes change to education in 21st century. The use of ICTs in the educational system that would not be able to solve the current problems in the educational system, but rather provide alternative solutions to the obstacles encountered in the conventional educational system. ICTs would be able to provide education and knowledge in a wider reach, even with a limited amount of resources, unlike conventional systems of education. The use of ICT in education adds value to teaching and learning, by enhancing the effectiveness of learning. It added a dimension to learning that was not previously available. It is affecting every aspect of education from teaching-learning to assessment and evaluation and also it improves the effectiveness of education. It facilitates research and scholarly communication. India is a highly populated country which has the third largest education system in the whole world with more than 500 universities and 3,000 colleges where ICT can be of great use as it can reach out to the masses. There will be a great change in the country's education system if the ICT is properly applied with creative learning procedures where the students can acquire skill-based knowledge and expertise in reasoning, effective communication, thinking in a modern way, digital literacy and etc. ICT is considered a mainstream in higher education.

REVIEW OF LITERATURE

This review examines currently available research literature that focuses on the use of technology to support inclusive teaching and learning.
(Yusuf, 2005)[1], The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning, and research
Al-Ansari, (2006)[2], A great deal of research has proven the benefits to the quality of education
Oliver, (2000)[3] , ICTs are able to provide strong support for all these requirements and there are now many outstanding examples of world class settings for competency and performance -based curricula that make sound use of the affordances of these technologies

OBJECTIVES

1.   To examine the role of ITC in higher education
2.   To find out Challenges and barriers to the implementation of ICT in Higher Education
3.   To evaluate the advantages of using ICT in higher education

METHODOLOGY

The methodology for this literature review is to systematically search the internet resources, data base of academic research and journal content listings. Searches are also made of relevant websites. Online reports as well as conference papers and thesis, where relevant have also been taken into consideration.

SIGNIFICANCY OF THE STUDY

The use of ICTs in the educational system that would not be able to solve the current problems in the educational system, but rather provide alternative solutions to the obstacles encountered in the

conventional educational system. ICTs would be able to provide education and knowledge in a wider reach, even with a limited amount of resources, unlike conventional systems of education.


HIGHER EDUCATION SCENARIO IN INDIA

India has one of the largest higher education systems in the world consisting of over 651 universities according to UGC as on 2013. Besides there are 31,324 colleges of higher learning in the country as on August 2011 according to the Higher Education in the 12th Five-Year Plan Report (2012-17). The number of students enrolled in the universities and colleges has increased since independence to 13,642 million in the beginning of the academic year 2009-10 with 1,669 million (12.24%) in the university departments and 11.973 million (87.76%) in the affiliated colleges (MHRD, Annual Report, 2009-10). However, this growth in numbers does not reflect much improvement in the delivery of higher education in the country.
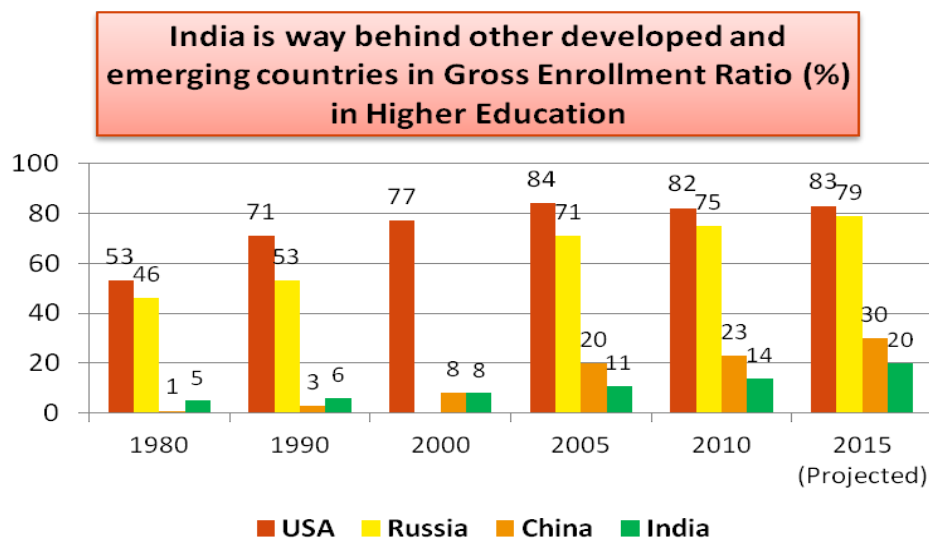
In India the higher education system continues to suffer due to inadequate access to technology and inequity. However, the application of ICT in higher education has not only brought about diversification in higher education but has also fostered new avenues for international mobility of traditional and non-traditional students.

There is a substantial gap in GER among rural and urban India in the Indian higher education segment
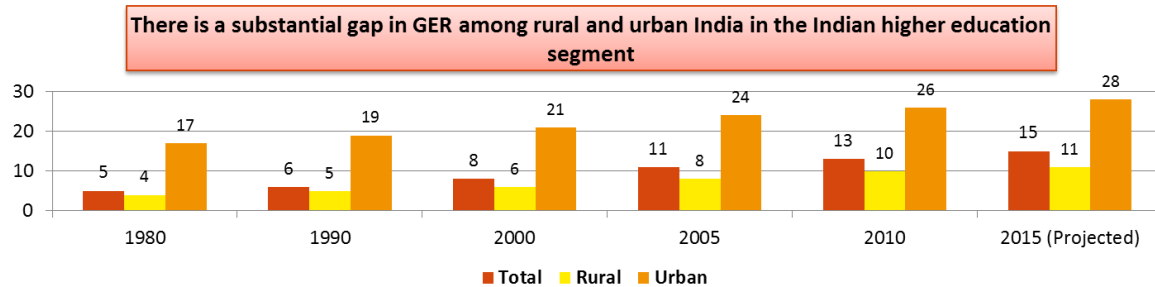
The main governing body at the tertiary level is the University Grants Commission, which enforces its standards, advises the government, and helps coordinate between the center and the state. Indian higher education is decentralized with separate councils responsible for the regulation of different institutions. The diagram below depicts the different councils of Higher Education functioning under Ministry of HRD, GOI.
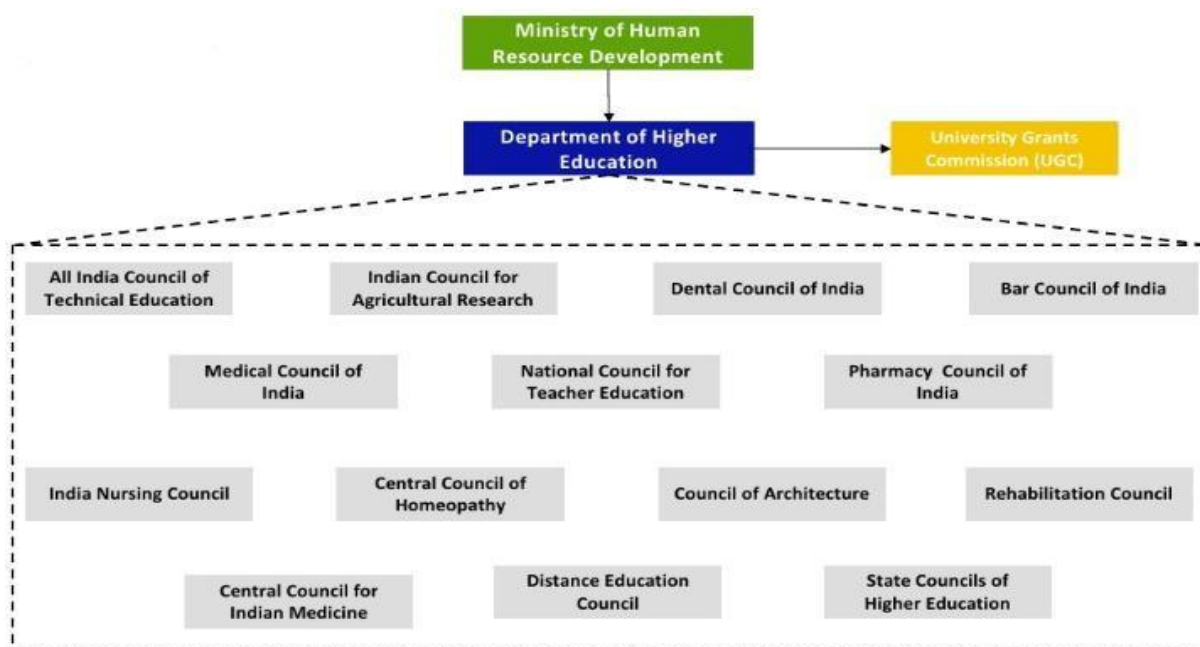
1. ICT IN TEACHING AND LEARNING

While for higher education sector is planned to build a knowledge repository of multidisciplinary subjects, as a strategy to counter the shortage of faculty in higher education, EDUSAT will be used to share the available expertise through modular programmes. This will be done by networking institutions, creation of virtual laboratories, creation of database, access to expert lectures and technological developments in industries and research organizations etc. Teaching and learning can further be improved by replacing of conventional teaching instead of the usual age old method of chalk and talk for teaching by innovative methods like power point presentations and animations, modeling and simulations, video clips and using AV aids, LCD projectors etc. This enhances the learning ability of the student and also helps the teacher to elaborate the difficult concepts effectively within a short time span.

2. ICT IN RESEARCH

Integration of ICT in higher education enhances the quality of research work and more number of individuals enrolled in the research work in various fields. ICT facilitates the links across the world in all subject matter and made social networking. It saves time, money and effort to the researchers in their research studies. The collection and analysis of large data becomes easier through the availability of various software. The unprecedented growth in bandwidth and computing power provide opportunities for download huge amount of data and can perform complex computations on them in a fast manner to get an accurate and reliability of data.

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3. ICT AS A CHANGE AGENT IN HIGHER EDUCATION

The evolution of higher education in India combined with the need to sustain and be competitive in a global scenario requires decisions to be taken quickly and effectively. This has enhanced the scope and complexity of administration, thus making it necessary to adopt different methods of higher education administration.

CHALLENGES IN INDIAN HIGHER EDUCATION:
The Challenges that are encountered in achieving optimized ICT environment in educational institutions:

1.   Infrastructure- related
2.   Teacher-related
3.   Capacity-building related
4.   Technical-support related
5.   Language and content-related
6.   Sustainability related
7.   Equality-related

1.   Infrastructure-related challenges
A pre-requisite for spread and development of ICT tools in the country is a steady telecommunication network in the country. However, there are a number of other site-specific

reasons, beside the over-arching national lacuna that impedes optimization of ICT resources in Indian class rooms. Some intrinsic infrastructure-related shortcomings such as small-size classrooms, non- availability of continuous electricity, non-availability of television sets, or sometimes even technicians for maintenance. As far as ICT resources are concerned, it is not always non- availability of hardware or software or proper e-content; it may also be poor organizations of resources, sub-standard quality of hardware, inappropriate software or insufficient time and curricular scope to incorporate ICT in the knowledge-dissemination framework.

2.   Teacher-related challenges:

For successful functioning of ICT in educational scenario, teachers need to accept the major challenge of re-thinking and re-framing their roles and competencies from that of knowledge-generators to knowledge –facilitators, a step that essentially may call for a re- appraisal of the traditional role of teachers in India.

A major area of concern is the mindset of certain teachers that ICT implementation may reduce or altogether eliminate the role of teacher-educators in the classrooms by substitution through computers, thereby creating a resistance to the digital revolution in educational technology. However, all these can be taken care of by underpinning the necessity of ICT in educational theories, and holistic training schedules for teachers to equip them and purge the irrational fear and apathy towards technology tools.

3.   Capacity-building related challenges:

Training teacher-educators for ICT intervention in classrooms needs to recognize a two- pronged imperative, namely pre-service training and in-service orientation and training. The need of the hour is to integrate training for ICT use into pedagogical training, and not simply training them to use ICT tools. Setting up and running a computer or printer is not enough for teachers to be able to initiate, motivate and prepare students for the future. Instead, teachers should be sensitized to their own responsibilities and inspired to go for skill–upgradation as part of capacity-building initiative.

4.   Technology support related challenges:

A major obstacle that often poses insurmountable and sudden challenges to the teacher is the lack of proper technical support facilities in educational institutions. Since, teacher- educators are vested with the responsibility of knowledge-dissemination in ICT-enabled teaching-learning, the task of how such technology is deployed, used, how different equipments are to be installed, operated and maintained (including software), network administration and network security need to be deputed to sound professionally skilled technical group/technicians. In fact, teachers often suffer from a fear of equipment break-down or software mal-functioning that deters them from using ICT in classrooms, and often causes inferiority and insecurity issues among teacher-educators.

5.   Language and content-related challenges:

English is the dominant language of the internet as well as the major software produced world-wide. Most of the web-based resources are in english. In this regard, it is very important to focus on the need for content-development in regional languages, as well as english that is comprehensible to most Indian students. There is a pressing need to develop original educational

content in the form of radio/television programmes, interactive multimedia learning materials on CD- ROM or DVDs, Web content etc.

6.   Sustainability related challenges:
In order to ensure that like many government projects that start with a bang and end with a whimper, chiefly due to paucity of funds and lack of consistent government initiatives, the ICT projects need to be linked to a self-supportive mechanism, whereby the beneficiary institution is empowered through different (indigenous/outside) channels to ensure pursuance of the project with the help of other stake-holders.

BARRIERS TO THE IMPLEMENTATION OF ICT IN HIGHER EDUCATION

Although the government is committed to implementing ICT in education, the process is hindered by a number of barriers. The barriers are categorized as external or internal-

1.   ICT Supported Infrastructure and Lack of Resources
The effective use of ICT would require the availability of equipments which are not available in all the educational institutions. Besides, ICT requires up-to-date hardware and software. High-speed internet connection is another prerequisite for integrating ICT into the teaching-learning situation. But unfortunately internet access is very poor.

2.   Insufficient Funds
Effective implementation of technology into education systems involves substantial funding. ICT-supported hardware, software, internet, audio visual aids, teaching aids and other accessories demand huge funds. The effective use of technology depends on the availability of hardware and software and the equity of access to resources by teachers, students an administrative staff. These costs are in most cases substantially high and cannot be provided by the stake holders.

3.   Political Factors
The most notable of the barriers to the use of ICT in education in developing countries seems to be the political will of the people in the corridors of power. The allocation of sufficient funds for the educational sector and ICT does not seem to be very attractive to the leaders. If the political leaders favour the technology, it will bloom. It is observed that the vision and mission of the government changes after change of power at the centre as they fix priority to some other sectors in the form of fund allocation and its policy implementation.

4.   Social and Cultural Factors
         The emergence of English as a dominant language of science, technology, business and international relations as well as the education and training would ensue the availability of globally useable knowledge products.

5.   Corruption
Corruption is one of the strong barriers to the implementation of ICT in education. . The misuse of government funds which could have been used to develop other sectors like the integration of ICT in education is channeled in other directions i.e. few people benefit from those funds by pocketing all the money . The budget for the newer technology is misused due to corruption at

every level in the administration. Huge budgets are passed to buy modern teaching and learning materials for the improvement of the teaching and learning process, but in the end only minor improvements are found in the overall technical and vocational sector.

6.   Teachers' Attitudes and Beliefs about ICT

Teachers' attitudes have been found to be major predictors of the use of new technologies in Instructional settings that the teacher' beliefs about teaching and learning with ICT are central to integration. To be successful in computer use and integration, teachers need ''to engage in conceptual change regarding their beliefs about the nature of learning, the role of the student, and their role as teacher. Hence the successful use of ICT into classroom largely depends on teachers' attitudes and belief relating to these.

7.   Lack of Knowledge and Skill

The success of educational innovations depends largely on the skills and knowledge of teachers. Teachers' lack of knowledge and skills is one of the main hindrances to the use of ICT in education both for the developed and underdeveloped countries. The faculty's belief in.

8.   Lack of Time

Teachers are burdened with heavy workload. In these circumstances teachers don't have time to design, develop and incorporate technology into the teaching learning situation. lack of time as one of the biggest constraints to the integration of ICT into the teaching learning.

ADVANTAGES OF USING ICT IN EDUCATION:
The adoption of IT/ICT in higher education facilitates the following
The innovative use of IT/ICT is believed to be a game changer that can significantly strengthen India's higher education system and Propel the country into becoming a "Knowledge Superpower". The innovative use of IT in Higher education addresses the three fundamental challenges of Access, Equity and Quality.
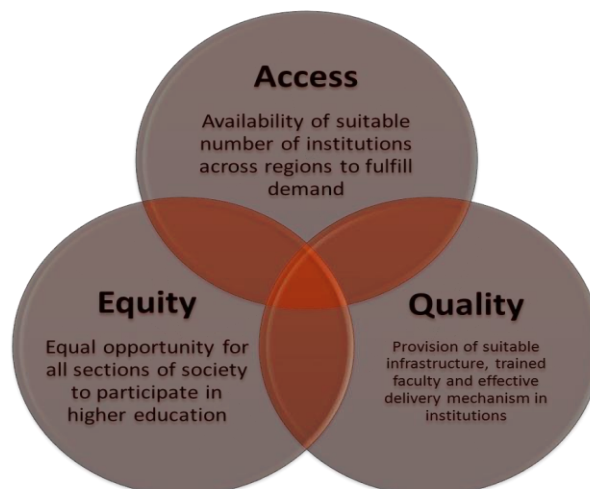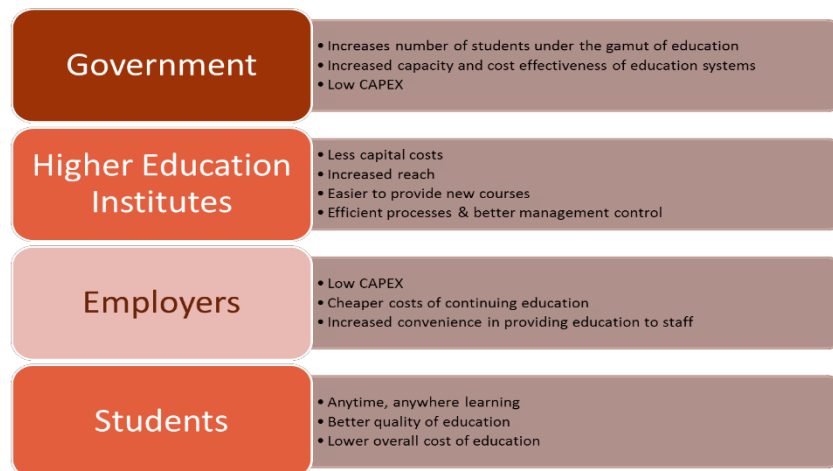

1.   Improving the access to the system through online education
2.   Improving the
3.   quality of teaching especially across remote locations
4.   Increasing transparency and strengthening systems, processes and compliance norms in

5.   Higher Education Institutes   Measure students learning participation and effectiveness
6.   Analyze student behaviour to maximize students involvement, optimize retentions, and improve placements , application volume, website analytics, and social media metrics for brand audit.

APART FROM THIS IT/ICT CAN PERFORM MULTIPLE ROLES IN HIGHER EDUCATION TO BENEFIT ALL STAKEHOLDERS

The benefits to the different stakeholders in Higher Education system through IT/ICT can be seen in the diagram below-

Government
- Increases number of students under the gamut of education
- Increased capacity and cost effectiveness of education systems
- Low CAPEX

Higher Education Institutes
- Less capital costs
- Increased reach
- Easier to provide new courses
- Efficient processes & better management control

Employers
- Low CAPEX
- Cheaper costs of continuing education
- Increased convenience in providing education to staff

Students
- Anytime, anywhere learning
- Better quality of education
- Lower overall cost of education

CONCLUSION

Higher education institutions are important actors in the community and can be perceived as models for society in the pursuit of sustainable development. Higher education should not only critically reflect on learning environments and learning processes for students, they should also reflect on their role in creating an infrastructure that supports and enhances lifelong learning processes. The wide adoption of ICT calls for mindsets and skill sets that are adaptive to change. ICT integration in higher education brings a change in student and teacher learning behavior and develops higher order skills such as collaborating across time and place and solving complex real world problems. To gain the optimum impact of ICT in education, certain issues: why teachers integrate technology; how ICT implementation could be effective; what the requirements are to achieve effective ICT implementation need to be addressed. Research studies have indicated that one of the key determinants of whether ICT implementation is successful is the teachers, particularly, teachers' knowledge. Teacher has to adapt continuous professional development in the educational uses of technology. There needs to be shared vision among the various stakeholders and a collaborative approach should be adopted. Care should be taken to influence the attitudes and beliefs of all the stakeholders. Also proper controls should be ensured so that accountability, quality assurance, accreditation and consumer protection are taken care of. ICT enabled education will ultimately lead to the democratization of education.

RECOMMENDATIONS

In the light of the above discussion, the paper suggests the following recommendations for Improving on the current situation:

1. Effective implementation of ICT in education requires commitment from the stake holders. That is, all the stakeholders and responsible authorities including teachers and other staff should be aware of the importance of technology in developing student's learning and should strive to overcome the barriers, so that students can benefit effectively from this ICT. Therefore, a clear vision of ICT integration in institutions in general and higher institutions in particular should be given due consideration to promotes effective use of ICT in the classroom.

2. Lacks of resources results in lack of ICT integration, which in turn results in lack of sufficient computer experience for both pupils and teachers (Rosen & Weil, 1995). The stakeholders and school authorities need to be provided with adequate facilities and resources for effective implementation of ICT.

3. The government should formulate policies for encouraging girls with respect to the adoption of ICT. Without proper empowering of women, it is not possible to implement ICT in education. Sharma (2003) states that the policy-makers must pay more attention to accommodate all sectors (and those excluded also like rural communities, women and disabled) while planning for adoption of ICT.

4. Effective implementation of ICT in educational institutions requires in-depth professional development. Attention needs to be given to in-service, pre- service and newly appointed teachers to acquaint them with the role of technology in educational settings and to train them on how to prepare and use ICT competently.

5. To introduce and implement computers in the classroom effectively, changing teachers' negative attitudes is essential. Therefore, if teachers want to successfully use technology in their classes, they need to possess a positive attitude to the use of technology.

REFERENCES

Yusuf, M.O. (2005). Information and communication education: Analyzing the Nigerian national policy for information technology. International Education Journal Vol.6 No. (3), Pp; 316-321

Al-Ansari, H. (2006). Internet use by the faculty members of Kuwait University.The Electronic Library Vol.24, No. (6), Pp; 791-803.

Oliver, R. (2000). Creating Meaningful Contexts for Learning in Webbased Settings. Proceedings of Open Learning 2000. (Pp; 53-62).Brisbane: Learning Network, Queensland.

Making the Indian Higher Education System Future Ready – FICCI Higher Education summit 2009 ; An Ernst and Young Report.

A report to the people on Education ;2014-15, Ministry of HRD , Government of India National Policy on ICT in Education; Ministry of HRD , Government of India

Dr. Md. Mahmood Alam, Use of Ict in Higher Education, The international Journal of Indian Psychology, Vol.3, Issue 4, pp. 66-70

Sukanta, S. (2012), "Role of ICT in Higher Education for the 21st Centuary", Science Probe, 1, pp.30-41.

Sanat Kaul (2006), "Higher Education in India: Seizing the Opportunity", (ICIER Working Paper

No. 179), New Delhi: Indian Council for Research on International Economic Relations,

Mehta, S. & Kalra, M. (2006), "Information and Communication Technologies: A Bridge for Social Equity and Sustainable Development in India", The International Information & Library Review, 38(3), 147-160.

Bhattacharya, I. & Sharma, K. (2007), 'India in the knowledge economy – an electronic paradigm', International Journal of Educational Management Vol.21 No. 6, Pp. 543- 568.