

USE OF ICT IN TECHNICAL EDUCATION: A STUDY OF UTTAR PRADESH

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The rapid economic growth that has resulted in a strong demand for trained human resources as well as an increase in the competitiveness of Indian enterprises in a globalised market has elevated the higher education sector to a priority sector in today's economy. Although the sector faces numerous issues, some of the most significant are related to the amount and quality of education delivered; funding; inclusivity; research and development employability of graduates; and equal access to the benefits of international cooperation. Efforts by private higher education providers to supplement state efforts to address the growing need for skilled workers have been gaining momentum. Universities that are more holistic, flexible, and energetic are needed in India. In the previous few decades, the Indian higher education sector has experienced significant expansion. Private academic institutions that provide higher education in conventional and professional fields and courses have experienced amazing expansion in recent years. Globalization and economic liberalisation have created prospects for the expansion of higher education institutions; nonetheless, there is still a scarcity of academic institutions, despite the fact that the demand for higher education is steadily rising. A broad network of academic institutions, including self-financed AICTE certified universities and colleges, is responsible for providing management and technical education in the country. The commitment and involvement of the organization, as well as the performance of the teachers, are all critical components of high-quality professional education. The organisational climate and working conditions have a significant impact on these factors. In light of this, the current article attempts to investigate the role of information and communications technology (ICT) in technical education, with particular reference to management and engineering schools in the state of Uttar Pradesh.

INTRODUCTION

Higher education has long been recognized as one of the most important areas in terms of providing direction for national development. Higher education is given greater importance in the national development in the new millennium, and efforts are being made to expand the educational network of colleges, universities, and institutions of national importance, as well as to strengthen the staff, faculty, and infrastructure to provide high-quality education. However, it is necessary to restructure and reorient the social science education and research in order to effectively deliver it. In opposition to this viewpoint, the present study seeks to analyze the higher education systems and their current situation in India, while also proposing an action plan for increasing their efficiency and productivity.

It is the efforts of society to educate computer education in the current and growing

environments of the globalised period that is known as Information and Communications Technologies (ICT). Computer and communication devices, as well as software applications that run on them, are taught, as well as systems that are developed with them. Everyone today need a fundamental understanding of information and communications technology (ICT) in order to live comfortably. Teachers must be proficient in the fundamentals of information and communication technologies (ICT) in order to play a vital role in educational technology. It is essential for students to participate effectively in the development of modern technical society in order to be successful in their academic careers. Increasingly in demand is professional and competent labour in today's globalised world, which is a result of globalisation itself. In this context, access to high-quality higher education for all has emerged as a critical aspect in the pursuit of economic growth and development for all. An rise in the number of institutions of higher technical education offering open and distance learning programmes is being made in order to promote access to higher technical education and expand its reach to the most remote corners of the country. Furthermore, it is meeting the needs of those who wish to continue their education throughout their lives at an inexpensive price. Over the last two decades, advancements in information and communications technology (ICT) have been integrated into higher education systems around the world. It is absolutely necessary for India to emerge as a knowledge superpower in the shortest feasible period that we transform our demographic advantage into a knowledge powerhouse by nurturing and sharpening our working population into either a knowledge or a knowledge enabled working population. Human Resource Development would almost definitely be the most important factor in making it happen. In a relatively short period of time, information and communications technology (ICT) has emerged as one of the fundamental building elements of modern society. Understanding information and communications technology (ICT) and mastering the fundamental skills and ideas of ICT are now considered to be part of the core of education in many nations. Fortunately, the need for information and communications technology (ICT) as a tool in technical education is currently available, and we intend to make full use of it. In the education sector, the national mission on education is emphasizing the role of information and communication technology (ICT) more to increase the current enrollment rate in higher education from 13.5 percent at present to 21 percent by the end of the 12th Plan period, according to the mission. The use of information and communication technology (ICT) presents a tremendous opportunity for all teachers and professionals to pool their collective wisdom for the benefit of all Indian learners. It is obvious that placing a strong emphasis on information and communications technology (ICT) is a fundamental requirement because it acts as a multiplier for capacity building efforts of educational institutions without compromising quality. It is also necessary to maintain a high growth rate of our economy through the capacity building and knowledge empowerment of the people, as well as to promote new emerging multi-disciplinary fields of knowledge. Considering all of the factors, information and communications technology (ICT) can act as a change agent in education and society by promoting an appropriate balance between content generation, research in critical areas relating to the imparting of education, and connectivity for integrating our knowledge with the advancements in other countries.

Because it is the most populous state in the country, Uttar Pradesh must prioritise the quality of higher education, particularly in the fields of engineering and management

course development. In the last decade, a large number of government and state institutions, as well as private colleges, have sprung up in Uttar Pradesh. The research focuses on the evolution of information and communications technology (ICT) in the higher educational sector in Uttar Pradesh, as well as how ICT can operate as a potent agent of change in practises to which technical institutions have become accustomed. The consequences of the impact of information and communications technology (ICT) on students, teachers, research work, institutional and societal effectiveness are explored in this study. The use of information and communications technology (ICT) in higher education has become a fundamental aspect of the educational process; nonetheless, there are differences in the purposes and frequency with which it is used among students. This may be dependent on a variety of factors, including the presence of ICT-equipped labs, workshops, classrooms, and libraries; the socioeconomic position of students; the nature of the subjects studied by users and non-users of ICT services; and the availability of ICT services. Despite the government's initiative to achieve excellence in technical education, as well as its investment in developing and supporting ICT infrastructure in institutions of higher learning, it has been observed that not all students have equal access to information and communications technology (ICT) resources. The procurement and application of information and communications technology (ICT) are currently beset by numerous difficulties. The current research effort will also be undertaken in order to expose some of the hindering factors that are functioning as roadblocks to the usage of information and communications technology (ICT) in technical educational institutions. Lack of search skills, automation at an early stage, consistent power supply, and technical know-how are just a few of the issues that technical educational institutions, particularly engineering and management courses, in Lucknow and the surrounding area are dealing with right now, according to the report. The purpose of this study is to assess the current state of information and communications technology infrastructure and services, as well as the usage of information technology in management and technical institutions in chosen locations of Uttar Pradesh.

ICT IN HIGHER EDUCATION

Globalization and the widespread use of the Internet are both associated with the seismic shifts that have occurred in recent years, according to the United Nations Development Programme. The widespread use of information technology has accelerated the generation and transmission of information, resulting in communication that is more efficient than ever before. Information technology is revolutionising the way we communicate, work, and play with one another. A sweeping reorganisation of business is being enabled by computers and the Internet, ranging from online input procurement to greater decentralisation and outsourcing. Markets have become more efficient as a result of increased access to information provided by information technology. Competition and innovation have been accelerated even further as a result of globalisation. It also has the additional benefit of speeding up the diffusion of new technology through trade and investment (Mamkootam, 2003). The selection of an appropriate strategy and the subsequent implementation of that strategy are the most important aspects of change management. Carnall (1995) asserts that any change in strategy must be communicated to the stakeholders involved in the process. Also necessary is ensuring that they are aware of the ramifications of the change and that they are capable of adjusting to them.

When implementing change, it is critical to ensure that all stakeholders understand and support the vision, strategy, and plan for achieving the goals. Their belief in their ability to develop the necessary skills to cope with and fully benefit from the change should be based on their own experience and ability to learn. They must be able to adapt to changing attitudes and ways of working in order to be effective. The authors of Beer and Nonria (2000) believe that most traditional organisations have come to terms with the fact that they must either change or die. The process of bringing about change continues to be one of the most difficult tasks to complete. The majority of initiatives involving the introduction of new technology, restructuring, downsizing, or transforming corporate culture have met with a dismal level of success. In the words of A Cornall (1995), "In order to effect change, we must first recognise that change is desirable and feasible." The first step is to persuade people that changes are required." According to Sumanta Ghoshal and colleagues (2000), nearly a decade has passed since India took its first tentative steps toward economic liberalisation in 1991. Most Indian managers who have survived the traumas of industry overcapacity and restructuring, the onslaught of foreign competition, and the growing sophistication of customers and technologies will quickly agree that companies all over the country, in all kinds of businesses, are in the midst of radical change.

Information and communications technology (ICT) is a type of technology that supports activities that involve information. Data gathering, processing, storing, and presenting are some examples of such activities. Collaboration and communication are becoming increasingly important in these activities. Information and communication technologies (ICTs) include the hardware, software, networks, and media used for the collection, storage, processing, transmission, and presentation of information (voice, data, text, and images), as well as the services that are provided in conjunction with them. IT can be divided into two categories: information and communication infrastructure, which refers to the physical telecommunications systems and networks (cellular, broadcast, cable, satellite, postal), as well as the services that use them (Internet, voice, mail, radio, and television), and information technology, which refers to the hardware and software used for information collection, storage, processing, and presentation. Information and communication infrastructure is divided into two categories: information and communication infrastructure and information technology.

It is defined as any and all devices, tools, content, resources, forums, and services (both digital and those that can be converted into or delivered through digital forms), as well as those that can be converted into or delivered through digital forms, that can be deployed for the purposes of teaching and learning, enhancing access to and reach of resources, capacity building, and management of the educational system (including online learning environments) (including distance learning). Additionally, these will include interactive digital content, internet-connected and other satellite communication devices, radio and television broadcasting services, web-based content repositories and interactive forums, learning management systems, and management information systems, to name a few. Among the processes covered will be those for digitization, deployment and management of content, development and deployment of platforms, as well as processes for capacity development. In addition, processes for the creation of forums for interaction and exchange of information will be covered.

Technology such as information and communications technology (ICT) and communications technology (CT) are the infrastructure and components that enable modern computing. Both the internet-enabled and mobile spheres, powered by wireless networks, are included in the definition of information and communications technology (ICT). Aspects of ICT that are no longer in use today include antiquated technologies such as landline telephones, radio broadcasting, and television broadcasting — all of which are still widely used today alongside cutting-edge ICT components such as artificial intelligence and robotics. Additionally, the term ICT is used to refer to the integration of audio-visual, telephone, and computer networks through the use of a single cabling or link system. Because “the concepts, methods, and applications involved in information and communications technology (ICT) are constantly evolving on an almost daily basis,” there is no universal definition for ICT. The broad definition of information and communications technology (ICT) includes any product that can store, retrieve, manipulate, transmit, or receive information electronically in a digital form, such as personal computers, digital television, email, robots, and so on. The advancements, standards, specifications, and subsequent adoptions of e-learning technologies have resulted in a significant increase in the extensibility, interoperability, and scalability of these technologies. E-learning is quickly becoming a significant mode of instruction. Computer multimedia provides excellent opportunities for the creation and presentation of visually enhanced learning environments in a variety of settings. Within a relatively short period of time, the most recent technologies associated with virtual reality will also play an important role. In the information age, one of the most fascinating phenomena to witness has been the rapid development of information and communication technology, particularly the Internet and other forms of the World Wide Web. ICT facilitates our access to information, facilitates the development of new forms of communication, and facilitates the provision of numerous on-line services in the fields of commerce, culture, entertainment, and education.

The integration of information and communication technology (ICT) into teaching and learning is a high priority on the educational reform agenda. Furthermore, information and communications technology (ICT) can be viewed as a means of integrating into a globalising world. It is assumed that information and communications technology (ICT) will bring about revolutionary change in educational methodologies. The innovation does not lie in the introduction and use of information and communications technology (ICT), but in its role as a contributor to a more student-centered approach to teaching and learning. The improvement and upgrading of the quality of education and instruction is an extremely important concern. There are numerous ways in which information and communications technologies (ICTs) can improve the quality of education. The information and communication technologies (ICTs) are also tools that enable and bring about transformation. Use of information and communication technologies (ICTs), which can take the form of videos and television programmes as well as computer multimedia software that combines sound, transcripts, and multicoloured moving imagery can be made in order to make available stimulating, thought-provoking, and reliable content that will keep students interested in the learning process can be made possible. Radio on the other hand, through interactive programmes, makes use of songs, sound effects, adaptations, satirical comedies, and supplementary collections of performances to encourage students to listen and become more interested in the training that is being

provided. Compared to earlier audio-visual media, academics have embraced the use of computers in the classroom much more readily than they have earlier audio-visual media. Due to the fact that computers' strength lies in their ability to manipulate words and symbols - which is at the heart of academic endeavour - this is the case.

There is a growing trend to incorporate e-learning, also known as online learning, into courses taught both on campus and through distance learning. Distance education and eLearning are not necessarily the same thing, and their cost structures can be very different as a result. Whether or not e-learning improves quality or lowers costs is dependent on the specific situation. Information and communication technologies (ICTs) in general, and e-learning in particular, have helped to lower the barriers to entry into the higher education business. According to a number of commentators, information and communication technologies (ICT) improve teaching, learning, and research from the perspectives of both constructivist and instructive theories of learning. The implied acceptance of technology by various commentators, whether as neutral and autonomous, neutral and human controlled, autonomous and value laden, or human controlled and value laden, lies at the heart of this growing confidence in the role of technology in higher education.

The National Policy on Education 1986, as revised in 1992, emphasised the importance of utilising educational technology to improve the overall quality of the educational experience. Education Technology and Computer Literacy and Studies in Schools (CLASS) were two major centrally sponsored schemes that resulted from the policy statement, paving the way for an even more comprehensive centrally sponsored scheme, Information and Communication Technology in Schools (ICT in Schools). The use of educational technology was also given significant consideration in another scheme aimed at improving science education. The National Curriculum Framework also emphasises the important role that information and communications technology (ICT) can play in school education. The use of information and communications technology (ICT) to improve the quality of education is also included in the Government of India's flagship education programme, the Sarva Shiksha Abhiyan. Again, in its report on Universal Secondary Education, the Central Advisory Board of Education recommended that information and communications technology (ICT) be integrated into the norm of schooling. Because of the convergence of technologies, it has become necessary to conduct a thorough examination of all possible information and communication technologies for the purpose of improving school education throughout the country. In order to make a comprehensive choice of ICT for the holistic development of education, a sound policy must be in place. The ICT Policy in School Education initiative is motivated by the tremendous potential of information and communications technology (ICT) for expanding educational opportunities and improving educational quality. This policy aims to provide guidelines to assist the states in optimising the use of information and communications technology (ICT) in school education throughout the country. As the shelf life of knowledge and information decreases in today's information society, there is an increase in the number of people who are lifelong learners. People must have access to information through information and communications technology (ICT) in order to keep up with the latest developments (Plomp, Pelgrum & Law, 2007). Education, which has always played a critical role in the economic and social development of a country, becomes even more important in such a

situation. Education not only improves an individual's productivity skills, but it also increases his or her earning power. It enhances his sense of well-being as well as his ability to absorb new ideas, increases his social interaction, provides access to improved health, and provides a variety of other intangible benefits as a result of his participation (Kozma, 2005). Different types of information and communication technology (ICT) products that are available and relevant to education, such as teleconferencing, emailing, audio conferencing, television lessons, radio adcasts, interactive radio counselling, interactive voice response system, audiocassettes and CD ROMs, among others, have been used in education for a variety of purposes (Sharma, 2003; Sanyal, 2001; Bhattacharya and Sharma, 2007). Today, information and communications technologies (ICTs) such as laptops that can be connected wirelessly to the Internet, personal digital assistants, low-cost video cameras, and cell phones have become more affordable, accessible, and integrated into large sections of society around the world. Education and health care can be made more widely available. It can also help to restructure organisations, promote collaboration, increase democratic participation of citizens, improve transparency and responsiveness of government agencies, foster cultural creativity, and aid in the development of social integration (Kozma, 2005). The only way to teach students to be participants in the growth process in this era of rapid change is through education and the integration of information and communication technologies (ICT). Digital resources such as digital libraries, which allow students, teachers, and professionals to access research materials and course materials from any location at any time, are also made possible by information and communications technologies (Bhattacharya and Sharma, 2007; Cholin, 2005). Such facilities facilitate the networking of academics and researchers, as well as the exchange of scholarly material. This helps to avoid duplication of effort (Cholin, 2005).

Technology for information and communication (ICT) is a broad term that encompasses virtually any communication device or application. It includes everything from radio to television to cellular phones to computer hardware and software to satellite systems and everything in between. It also includes the various services and applications that are associated with these devices, such as videoconferencing and distance learning, among others. When such technologies are used for educational purposes, such as to support and improve the learning of students and to develop learning environments, ICT can be considered a subfield of Educational Technology, according to the International Society for Information and Communication Technology. For example, information and communications technology (ICT) is being used in higher education for developing course material; delivering content; and sharing content; communication between learners, teachers, and the outside world; creation and delivery of presentations and lectures; academic research; administrative support; and student enrolment, among other things. The increasing use of information and communication technologies has resulted in changes to teaching and learning at all levels of higher education systems, resulting in an improvement in the overall quality of education. Traditional modes of teaching and learning are increasingly being replaced by online and virtual environments. and virtual environments The integration of information and communications technology (ICT) into the educational system opens up a plethora of possibilities. The use of information and communications technology (ICT) in education not only enhances the classroom learning process, but it also provides the opportunity for distance learning. Distance learning has

benefited from information and communications technology. The teaching community is able to reach out to remote areas, and learners are able to access a high-quality learning environment from any location and at any time of day. It is critical that teachers or trainers are encouraged to incorporate technology into their teaching methods in order to provide pedagogical and educational benefits to their students. Rather than acquiring computer skills and purchasing software and equipment, successful implementation of ICT to lead change is more about influencing and empowering teachers and supporting them in their engagement with students in learning. Education enabled by information and communications technology (ICT) will eventually lead to the democratisation of education.

OBJECTIVES AND RESEARCH METHODS

The present paper is based on major research study. The study has been conducted keeping in view of the following main objectives:

- To determine the evolution of ICT in technical education sector with special reference to management and engineering institutions in Uttar Pradesh ;
- To examine the status of infrastructure, facilities and delivery of services related to ICT in technical and management institutions;
- To determine the role of ICT in teaching, learning, administration, research and society development in field of technical education;
- To assess the impact of ICT on students and teachers in their study , teaching and research ;
- To determine the problems and prospects of ICT integration in technical education ;
- To suggest policy measures for improving the infrastructure, facilities and services of ICT in technical education sector and resolving the problems in their effective use by teachers and students.

The present study is empirical in nature and based on primary data collected through field survey. We have selected all the geographical regions viz. Central, Western, Eastern, and Bundelkhand. Lucknow (Central), Moradabad (Western), Varanasi (Eastern) and Jhansi (Bundelkhand) were selected for identification of technical and management institutions for field survey. Overall, about 169 faculty members and 350 students pursuing graduation and post graduation courses from institutions were surveyed from all the selected regions of state. Colleges, institutes and universities from all the regions were randomly selected for survey. For purpose of field survey, interview schedules were developed, however, non-participant observations by the researcher were also made in order to get the insight on the topic of research. The primary data has been analyzed, discussed and interpreted while critical appreciation of pertinent literature has been also ensured in order to get the insight on the subject of research.

OBSERVATIONS AND DISCUSSION

The rapid economic growth that has resulted in a high demand for skilled human resources

as well as an increase in the competitiveness of Indian industries in a globalised economy has elevated the higher education sector to a priority sector in today's economy. Although the sector faces numerous challenges, some of the most significant are related to the quantity and quality of education delivered; funding; inclusivity; research and development employability of graduates; and equitable access to the benefits of international cooperation. Efforts by private higher education providers to supplement state efforts to meet the growing demand for skilled workers have been gaining momentum. University education in India is currently in the midst of a major transformation that is just getting started. Universities that are more holistic, flexible, and vibrant are needed in India. In the last three decades, the Indian higher education system has experienced significant expansion. Private academic institutions that provide higher education in traditional and professional disciplines and courses have experienced phenomenal growth in recent years. Globalization and economic liberalization have created opportunities for the expansion of higher education institutions; however, there is still a scarcity of academic institutions, despite the fact that the demand for higher education is steadily rising. The pursuit of higher education is essential for economic development and the achievement of a high rate of growth. As a result of the fact that most universities do not have adequate infrastructure and teachers to provide higher education to students in the fields such as biotechnology, health, information technology (IT), automobile manufacturing, retail, banking and finance), there is an increasing shortage of skilled human resources in these fields. Because of the inability to establish the necessary infrastructure for e-learning and education, the benefits of e-learning have not permeated among the younger generation. More than 90% of universities and colleges have been found to have very poor quality in higher education, and the process of accrediting colleges and universities is still in its infancy stage. Despite the fact that India offers a competitive environment for pursuing higher education and that the fee structure in most professional courses is comparatively cheaper than in other parts of the world, most states, with the exception of a few regions of the country, have failed to develop educational hubs for higher education.

The Indian government has formally acknowledged the significance and role of higher education in the process of nation-building. According to a recent World Bank report, economic development is becoming increasingly linked to a nation's ability to acquire and apply technical and socio-economic knowledge, and that the process of globalization is hastening this trend even further. In education, addressing issues of equity and excellence at the same time has always been a difficult task. Higher education of high quality is prohibitively expensive when measured in terms of its actual cost. Education has traditionally been regarded as a noble profession that should not be pursued for financial gain. Higher education, and particularly professional education, has, on the other hand, emerged as one of the most profitable businesses, not only for the private sector, but also for non-governmental organisations and international organizations. The global education market is currently valued at US \$ 2 trillion, according to current estimates.

Traditional universities around the world are in the midst of a transitional period and should be preparing themselves gradually for transformation. Education requirements are changing as a result of the Internet and technological advancements in information

and communication technology. The demands of the market are shifting. The education system as a whole, including students, faculty, administration, and every component of it, will have to change in order to meet these new requirements. India is currently in the fifth phase of its privatization programme. The Private University Bill is being seriously considered by the government. There are clear trends indicating the emergence of a new education-related enterprise. This is especially true for professional education, which includes fields such as technology, biotechnology, computer technology, and business administration. The governments of several states, including Karnataka, Tamil Nadu, Maharashtra, Chhattisgarh, and Uttarakhand, have already begun the process of establishing private colleges and universities. Joint ventures have also been formed between reputed international academic institutions and Indian organizations for the purpose of establishing institutions of higher learning and education in both countries.

We must recognize that education is not only a serious business that is essential for manpower planning, but it is also the key to international benchmarking of our standards. India is now at a crossroads, and she must improve the higher education system in order to keep up with the rapidly expanding higher education market in the world. As a result, reforms in the higher education system must be implemented effectively, and this should be the top priority for development planning and management. Higher education has long been recognized as one of the most important sectors in terms of providing direction for national development. Higher education is given greater importance in the national development in the new millennium, and efforts are being made to expand the educational network of colleges, universities, and institutions of national importance, as well as to strengthen the staff, faculty, and infrastructure to provide high-quality education. However, it is necessary to restructure and reorient the social science education and research in order to effectively deliver it. In the last three decades, the Indian higher education system has experienced significant expansion. Private academic institutions that provide higher education in traditional and professional disciplines and courses have experienced phenomenal growth in recent years. Globalization and economic liberalization have created opportunities for the expansion of higher education institutions; however, there is still a scarcity of academic institutions, despite the fact that the demand for higher education is steadily rising.

In order to improve the quality of higher education, the increasing use of information and communication technologies has resulted in changes to teaching and learning at all levels of higher education systems. Increasingly, traditional modes of teaching and learning are being replaced by online and virtual modes of teaching and learning. The integration of information and communications technology (ICT) into the higher education system opens up a plethora of possibilities. The use of information and communications technology (ICT) in higher education not only improves the classroom teaching and learning process, but it also provides the capability of e-learning. Distance learning has also benefited from technological advancements. The reach of teachers has expanded, and learners now have access to a high-quality learning environment from any location and at any time. Rather than acquiring computer skills and purchasing software and equipment, successful implementation of ICT to lead change is more about influencing and empowering teachers and supporting them in their engagement with students in learning. The use of information and communications technology (ICT) in education can

play a variety of roles by altering the teaching and learning process. Integration of ICT, on the other hand, is not a simple task. Policymakers, educators, educational administrators, and students in higher education face significant challenges in integrating information and communications technologies (ICTs) into the higher education system, which stem from environmental, cultural, and educational factors. The government support as well as the commitment of higher education institutions is required in order for the integration of ICT in education to be a successful process. Among academic staff, the most common obstacles to ICT use are: insufficient funds, insufficient opportunities for training, insufficient support from administration, inability to acquire personal ICT facilities, inadequate ICT facilities at the workplace, poor electricity supply, lack of ICT knowledge, insufficient time due to workload, a lack of interest in learning and a lack of time for practicing.

The adoption and use of information and communication technologies (ICTs) in higher education have a positive impact on teaching, learning, and research. ICT has the potential to influence the delivery of education while also enabling greater access to the same. Additionally, it will increase flexibility, allowing learners to access education regardless of their schedule or geographic location, among other benefits. It can have an impact on the way students are taught and how they learn as a result. Moreover, it would provide a stimulating environment and motivation to students during the teaching-learning process, which appears to have a significant impact on the process of learning in higher education by opening up new opportunities for both students and teachers. These possibilities have the potential to have an impact on student performance and achievement in various ways. Similar to this, greater accessibility to best practises and best course materials in education can result in better teaching and higher levels of academic achievement among student.

ANALYSIS OF RESULTS

Overall 169 faculty members from higher education institutions were surveyed. They were mainly from engineering and management background and were found academically engaged in private institutions mainly affiliated with technical university. Majority of them were from urban backgrounds and males. The overwhelming majority of the respondents were found belonging to General Castes. More than 1/3rd reported that they have Ph.D. degree while about half of the respondents had post-graduation qualification. Majority of respondents were Assistant Professors while a significant proportion of respondents in Western region were Professors. Majority of them were permanent.

Majority of respondents had teaching and research experience less than 10 years however, about 29 per cent respondents had teaching experience less than 2 years. Their monthly salary was reported less than Rs. 50,000 for majority of respondents. About half of the respondents reported that they are availing transport facility provided by their college/institutions. Most of the respondents reported that computer lab in their institutions had adequate number of computers for students, staff and faculty with internet connectivity. However, about 70 per cent respondents revealed that desk top along with internet connectivity with printer has been provided to them. More than 3/4th respondents reported that their institutions have arranged appropriate software for

computing, processing and analysis of data. Majority of the respondents further reported that their institutions have also subscribed online journals, books and periodicals. About half of the respondents reported that their institutions have digital cataloguing of library resources and also using computerized system for issuing books and periodicals. However, less than 2/5th respondents revealed that they have online access to library stock.

Most of faculty members have access to different types of ICTs outside of the college/institutes however, the level of access to different types of ICTs vary across the geographical regions and nature of educational institutions. Most of the respondents have opened their account in social media. They are mainly using face book, whatsapp, linkedin, skype and twitter. The faculty members admitted that information technology is being used for student administration, staff administration and general administration of higher education institutions. They are using different types of information technology for learning, teaching, research and other purposes. They were also found agreed on the view point of usefulness of information technology in academic activities. However, the quality of ICT infrastructure and technical support was rated as poor and average by significant proportion of respondents. They also desired orientation and exposure of ICTs for their effective use in education and administration.

Overall 350 students pursuing engineering, management and commerce courses were surveyed in order to examine their perception on role of ICT in higher education. Most of the students were from engineering discipline and belonging to private institutions affiliated with technical and state universities. More than half of the respondents were from rural background while less than 1/3rd respondents were from urban settings. Most of the respondents were males and belonging to Scheduled Caste and OBC communities. About 3/4th respondents were undergraduate students while about 12 per cent respondents were found pursuing MBA / PGDM. Their annual family income was reported less than Rs. 3 lakhs for majority of the cases. About 87 per cent respondents revealed that computer lab in their institute/college have adequate number of computer for student use. About 2/3rd students further revealed that internet connectivity is available to them. The availability of internet connectivity to students was found higher in government and government aided institutions.

About 56 per cent respondents revealed that their institutions have arranged appropriate software for computing, processing and data analysis. Less than half of the respondents reported that their institutions have subscribed online journals, books and periodicals. About 2/5th respondents further reported that their institutions have digital catalogue of library resources and library is using computerized system for issuing of books and periodicals. However, online access to library stock was reported by 1/4th students. Students have access to varied type of information technology however, the level of access to ICTs was reported limited. Most of the students have opened their account in social media mainly face book, whatsapp, twitter, linkedin and instagram.

More than half of the respondents reported that information technology is being always used for student administration mainly for registration, enrolment, admission, class scheduling, maintaining attendance and loading results. Students further reported that they are using different types of information technologies for learning and research. Majority of the respondents reported that they are using word processor, programming,

spread sheet and photo shop. Majority of the respondents further revealed that they are regularly using internet. However, about 46 per cent respondents are getting maximum access to internet at home. Majority of the respondents were found agreed about the usefulness of information technology in academic activities and improving teaching and learning in higher education institutions. However, slightly more than half of the respondents revealed that they find computer lab most accessible to get information through ICT for learning. The quality of ICT infrastructure and technical support was rated mainly average and poor and thus, they felt training and exposure for hardware and software in ICT.

POLICY IMPERATIVES AND SUGGESTIONS

- Teachers must be trained to abandon some of the lecture method of teaching in favour of more group–discussion and interactive methods, which include the use of more audio–visual aids such as overhead projectors, multi–media devices, and so on. Teachers should be encouraged to make the most of these devices, and institutions must make adequate provisions for them. -
- Students should be provided with the fundamental study materials (at a reasonable cost), and they should be encouraged to supplement their knowledge with additional readings from the library, field surveys, and other sources. In some management institutions, this is done on an ongoing basis. This should be applied to all courses and programmes, not just the most popular ones.
- Teachers should be trained in interpersonal skills and assisted in developing friendly relationships with students, administrators, and members of the corporate sector. The adoption of an indifferent (or even aggressive) attitude toward students should be discouraged in particular among teachers and other school personnel. They must cultivate an attitude toward students in which they are regarded as valuable “customers” who must be completely satisfied. Teachers’ attitudes must change, and this is an absolute necessity. In order to do so, they must be provided with counselling.
- Higher education institutions’ infrastructure should be improved and further developed. Teachers consider the computer lab, communication facilities (such as telephone, fax, e–mail, and so on), and electricity supply to be insufficient or non-existent. The accessibility of these facilities should be improved over time, for the benefit of both teachers and students.
- A greater variety of library resources is required, including electronic journals and other periodicals, textbooks and other reference books, audio–videocassette collections, and so on. It is necessary to make them increasingly more accessible to students. It is imperative that librarians at these institutions abandon their “close access” approach to their work and the display of literature and information resources.
- Until recently, the management of higher education institutions in India has placed little emphasis on the overall quality of the system or on the monitoring of its productivity. As a result, mechanisms for evaluating performance and

productivity should be developed, strengthened, and implemented in order to improve the efficiency and performance of organizations. It is recommended that universities and academic institutions adopt a total quality management approach that is oriented toward students and society.

- In order to provide quality academic inputs to students as well as a sound industry university interface, it is imperative that universities begin to recognize the critical importance of business process re-engineering, networking of in-house and off-campus faculties, and business process outsourcing.
- Universities and other institutions of higher learning and education require policies and environments that are conducive to student learning. It is necessary to establish a counseling centre for new students in order to provide proper guidance and counseling in terms of choosing the appropriate subjects and disciplines.
- Universities and academic institutions should develop and strengthen infrastructure for providing an academic environment, library resources, recreational facilities, internet access, and other advisory services through the internet in order to prevent students from backward and low-income groups from experiencing inferiority complexes during their academic careers.
- For distance learners and students pursuing different courses of education through the educational system, it is necessary to incorporate documentary films, educational films, and other digital educational materials.
- Science and technology have always played an important role in increasing the efficiency and improving the quality of the processes and products produced by humans. The use of information and communication technologies (ICTs) has enormous potential for improving the reach, accessibility, and quality of higher education. It has been discovered that most higher education institutions have poor quality information and communications technology infrastructure. As a result, increased investment in the development of ICT infrastructure is required. It is necessary for computer labs to have advanced-level computers, as well as wi-fi capabilities, appropriate software, and technical support.
- It is possible to alter the roles that university faculty members and students have traditionally played as a result of technological advancements. Faculty members at universities are free to coach and facilitate students' learning because of the technology that distributes information. Students can become active learners when technology is used to monitor their learning. They can work to effectively acquire new skills while solving problems as they learn. Higher education institutions, on the other hand, must place greater emphasis on the integration of information and communication technologies (ICTs) into course curriculum, lecture delivery, student-faculty interaction, administration of students and staff, and placement of students.
- There is tremendous potential for computer-based teaching, learning, and training in higher education institutions to improve both the quality and the accessibility of educational opportunities. However, improvements in content, services, the

mode of delivering knowledge, and educational infrastructure are required for e-learning to be successful. Video conferencing, video lectures, e-lectures, online courses, and other similar methods of teaching and training may be used to replace traditional methods of teaching and training.

- It is likely that distance education will become the dominant mode of instruction in the coming years. Distance learning has a lot of potential, and ICT integration can help you achieve that. Distance education initiatives involving information and communications technology (ICT) must be strengthened in order to better integrate technology into teaching and learning practises. For open and distance learning to be successful, proper planning, policies, and infrastructure (including connectivity, connectivity, and communication) must be in place. It is necessary to develop appropriate implementation strategies in order to ensure that information and communications technology (ICT) is used effectively to improve the quality and efficiency of education in open and distance learning systems.
- The University Grants Commission, the Academic Staff College, and Educational Research Centers should develop orientation programmes for teachers and university faculty on how to use information and communications technologies (ICTs) more broadly and effectively in developing course content, delivering lectures, and administering students and faculty.
- Teachers must be knowledgeable and skilled in the use of new digital tools and resources in order to assist all students in attaining high levels of academic achievement. It is necessary to increase the funding for new ICT resources in order to ensure that adequate ICT equipment and resources are available.
- Teachers and faculty members must be adequately equipped with information and communication technologies (ICTs) in order to improve their competencies and take on new roles in the teaching-learning process. The quality and quantity of in-service and pre-service training in information and communications technologies (ICTs) for teachers and faculty members should be improved.
- Education professionals must be assisted in meeting the challenge of effectively integrating information and communication technology (ICT) into their classroom practises so that students can be at the forefront of advancements in teaching practises and learning practises.
- In order to ensure the diffusion and effective use of technology, every classroom should have at least one computer as well as a computer projector system with internet access, and every educational institution should have at least one computer lab available for students.
- Course content should be revised in order to reap the maximum benefits from information and communications technologies, and the course delivery system should support this revision. Student knowledge delivery may be improved by using multimedia tools such as videogames, video lectures, online practicals, video conferencing, and so on. Students also require instruction and practise in presenting and delivering ICT-integrated lessons, among other things. Digital library resources such as online journals, periodicals, books, and reports should

be made available to them, as well as other resources.

- All higher education institutions that provide professional education should have internet access and wi-fi available to students, and smart classrooms should be available for students so that they can access learning materials through the use of wi-fi while also interacting effectively with faculty members.

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