

# Information and Communication Technology vis-a-vis Quality Enhancement in Higher Education

L.P. Singh

Director, Institute of Business Management, Bela (Darbhanga)  
Formerly, Professor & Head, Department of Commerce & Business Administration  
Ex-Director, Management Programme, L.N. Mithila University, Darbhanga

## Abstract

India has had a long tradition of inquiry and articulation of concepts of universe, self, role of state, economy, social order and other related matters. The methodologies adopted were subjective and objective and included observation, conceptualization, verification, articulation and teaching. As a result, India had gone far ahead of other countries in science – especially in mathematics, astronomy and chemistry, metallurgy and physics before the advent of modern era.

However, despite such an impressive growth of higher education over the past seventy years in Quantitative terms, its growth in qualitative terms has been an area of serious concern. The most appalling issue in this respect is that the very concept of QUALITY OF HIGHER EDUCATION has perhaps not been appropriately addressed. An attempt has been made in this paper to identify some prominent parameters of Quality in higher education. Next to it, we also propose to delineate the role of modern ICT in enhancing the Quality of higher education in the light of the identified parameters of quality.

**Key words:** Higher Education, Information Technology, Quality Parameters

Management Insight (2022). DOI: <https://doi.org/10.21844/mijia.18.2.1>

## Introduction

The theme of knowledge and higher education was fashioned in India by the ancient Rishis and sages in the Vedic Age, the date of which is uncertain but is supposed to be traceable to great antiquity. The early Gurukul system of education flourished in the Vedic and Upanishadic periods, but a huge University came to be set up at Takshashila in the 6<sup>th</sup> century B.C. Two other universities – Nalanda and Vikramsila – were established in the 4<sup>th</sup> and 5<sup>th</sup> centuries A.D., respectively.

India has had a long tradition of inquiry and articulation of concepts of universe, self, role of state, economy, social order and other related matters. The methodologies adopted were subjective and objective and included observation, conceptualization, verification, articulation and teaching. As a result, India had gone far ahead of other countries in science – especially in mathematics, astronomy and chemistry, metallurgy and physics before the advent of modern era. “Indian scientists discovered and formulated and anticipated by force of reasoning or experiment some of the scientific ideas and discoveries which Europe

---

**Corresponding Author:** Professor L.P. Singh, Director, Institute of Business Management, Bela (Darbhanga), Formerly, Professor & Head, Department of Commerce & Business Administration, Ex-Director, Management Programme, L.N. Mithila University, Darbhanga  
E-mail: [professorlpsingh@gmail.com](mailto:professorlpsingh@gmail.com)

**How to cite this article:** Singh L.P. (2022). Information And Communication Technology Vis-A-Vis Quality Enhancement in Higher Education, Management Insight, 18(2) 1-8

**Source of support:** Nil

**Conflict of interest:** None

**Received:** 25.10.2022; **Accepted:** 21.11.2022; **Published:** 28.12.2022

---

arrived at much later.” Ancient India was well equipped in surgery and its system of medicine survives to this day. A vast literature is also available on “Vriksha Ayurveda” (Herbal Medicine). In literature, in philosophy and in systems of yogic knowledge not only ancient India but medieval and modern India reached highest levels of achievement. “The higher education system flourished in ancient India well; and it continued to influence developments during its subsequent ages, in spite of diverse forms of odds that developed under the impact of changes in religion, and in social, economic and political life.”

## Modern Higher Education in India

The modern higher education system in India is only 140 years old, when the first three universities were set up in 1857 under the British Rule. Policy Guidelines given by Macaulay and Wood's Dispatch (1854) shaped the scope and the role of universities in India. To begin with, colleges set up in India were affiliated to British universities. In 1857, for the first time, universities were set up in India. Existing colleges got affiliated to these universities.

The period 1857 to 1947 was the period of slow development of institutions of higher education in India. They were set up mostly in administrative headquarters and port towns. They provided education in literature, history, philosophy, political science, social science and natural sciences. The thrust of development was mainly on liberal arts education. Science education occupied a very small proportion. The rate of development was slow as in a period of 90 years only 18 universities were set up in the country. Most of these followed the model of the three leading universities at the then Bombay, Calcutta and Madras. Along with liberal arts, some engineering and medical colleges were also set up. Most of the Colleges imparted education as formulated by the universities. The universities also acted as examining and degree granting bodies. The initiative in the hands of college teachers in terms of curriculum development was therefore, very much limited.”

In 1950-51, India had 27 universities which included 370 colleges for General Education and 208 colleges for professional education.

The successive policy of the Govt. swelled these numbers to 706 Universities, 25951 colleges, 5.90 lacs teachers and 136 lakhs students in higher education as of today. Education system has increased fourteen fold in terms of number of universities and 33 folds in terms of the number of colleges, in comparison to the number at the time of independence.

However, despite such an impressive growth of higher education over the past seventy years in quantitative terms, its growth in qualitative terms has been an area of serious concern. The most appalling issue in this respect

is that the very concept of quality of higher education has perhaps not been appropriately addressed.

What constitutes the quality of higher education?

What ought to be the parameters of quality in the field of higher education?

These are some of the issues that have perhaps not been clearly identified so far. A modest attempt is made here to identify some prominent parameters of quality in higher education. Next to it, we also propose to delineate the role of modern ICT in enhancing the quality of higher education in the light of the identified parameters of quality.

### Parameters of Quality in Higher Education

A general agreement on all the parameters may not be there, but the following aspects of quality may be acceptable to all.

#### *(I) Richness in Knowledge and Skill:*

Perhaps the most important parameter of quality in higher education relates to absorption of knowledge and generation of skill among the students. A recipient of higher education in the formal system conventionally chooses a set of disciplines, which, at a given time, have a body of extant information and knowledge as well as a level of skill at using those information and knowledge to practical applications. A college student, having completed his/her studies, is supposed to have acquired a subset of those extant information and knowledge and use them in practical applications. A university graduate, similarly, is expected to be well versed in a larger subset of the said body of information, knowledge and skill, and a doctorate degree holder is supposed to command a still larger subset. “In this respect, quality refers to the level of achievement of the graduate vis-à-vis the norm set (or adopted) by the institution imparting higher education. This entails the 'fitness for the purpose' criterion.”

It may be noted, however, that the method and content of imparting education are not the sole determinants of achievement of a graduate student; his/her personal traits and efforts also are important. When education is

imparted to many students, the positive and negative effects of personal traits and efforts (or a lack thereof) may even out so as to reflect the effective contribution of education to the average level of achievement of a mass of students.

At this juncture, we face an important question. Who decides and what determines the norm to be referred to in evaluation of the average level of achievement of a mass of students? Conventionally, teachers or a body of experts set those norms, which is reflected in the syllabi governing the subject matter to be taught to the students, and the examination system evaluates the achievement of the pupils. At the research level of education, the supervisor and the experts determine the norm and evaluate the research students. In turn, the information, knowledge and skill of teachers and experts have an effect on setting of norms. If they are themselves ill informed, less knowledgeable and poor at skills, it cannot be expected that they would set the norms commensurate with the demands of the discipline and the need of the society. Thus, the average level achievement of the body of experts (and teachers) determines the norms of quality.

Availability of reading materials and teaching aid is the next determinant of norms as well as the average level of achievement of experts, teachers and students. That is why one must appreciate the role of books, journals, documents and the libraries in determining the quality in higher education. Two important aspects of availability of reading materials and teaching aid must be considered, the first relating to the quality and the second relating to quantity. "That is to say that availability of high quality teaching aid and reading materials enough in quantity so as to make them accessible to each and every participant in the educational process without much efforts and delay would improve the quality of education."<sup>5</sup> Availability of high quality reading materials helps the teachers as well the students to have a better grasp of the subject matter, critical attitude, innovative tendencies and lucid communication skills.

It is important to note that the real world evolves continuously working under the law of cumulative causation in which quality begets further higher quality and degeneration leads to further degeneration unless

interrupted by a powerful shock of constructive destruction that is potent enough to change the said course of movement. "Exposure to the events occurring elsewhere, innovations and their beneficial applications taking place outside and the success (or failure) stories of others may stimulate one to change one's course. Availability of reading materials of high quality tends to prepare an environment suitable to such changes and, consequently, facilitate a movement upward towards a better quality of education."

*(ii) Relevance:*

The second most important parameter of quality is the appropriateness and relevance of the information, knowledge and skill imparted by education to the current and the foreseeable techno-economic and social needs and priorities of the nation (as well as the region) that supports the educational system. If higher education does not have some concordance to the said needs and priorities, we would hesitate to appreciate its quality even if it is okayed on the first principle laid down earlier. UNESCO (1998) rightly views that quality "reflects national, regional and global socio-economic, cultural and political visions".

*(iii) Creativity:*

The two parameters of quality (in education) mentioned above often join with the characteristics of students and under favourable conditions lead them to gain courage of facing challenges and conquering the adversities. Inculcations of problem solving ability, creativity, innovativeness and such faculties make the third parameter of quality in education. A poor quality of education discourages and subverts these faculties.

*(iv) Sublime Values:*

Nevertheless, there is some sort of conflict between the first two parameters deliberated above. The personal priorities of a college or university graduate of very high quality judged on the first criterion may not be conformal to the priorities of the nation or the regions that imparted excellent education to him/her or even the national/regional techno-economic and social needs.

In order to resolve the conflict pointed out above, it

requires the fourth important parameter to be spelt out. Education must inculcate among the graduates certain values such as to appreciate the importance of commitment, cooperation and compassion in making competence creditable. One must understand that in making us what we are today there is a great role of sincere efforts of many whom we know and many others whom we know not. We are indebted to them and the burden of this debt can only be lightened if we sincerely reciprocate and give unto those who live with us and will live after us. We have to move fast to a “give-and-take” culture in which we are not only receiving ideas from others; we have also to contribute to the ever growing stock of knowledge for the benefit of the entire humanity. These values are absolutely necessary for the establishment, functionality and development of a knowledge-based society towards which we are progressing steadily.

*(v) Cost-effectiveness:*

The fifth parameter of quality of education is its cost effectiveness. If two kinds of educational process assure the same quality but they differ in the cost incurred in attaining it, then the less expensive educational process is obviously better than its expensive alternative. After all, resources have multiple uses and every use has its opportunity cost.

### **Modern Information Technology and Quality in Higher Education**

Let us now explore the possibilities that modern information and communication technology has created for enhancing the quality of higher education.

### **Possibilities in Enrichment of Information, Knowledge and Skill**

The modern information technology has greatly extended the possibilities of enrichment of information, knowledge and skill. Development of e-books, e-journals, e-libraries, e-encyclopaedias, e-photography, electronic audio-visual aid, etc has opened up a world of possibilities before us. Internet can be used to download a variety of reading materials, often illustrated by means of audio-visual aid. Illustration may be static with different colour schemes or dynamic with the use of

animation. Thousands of books, if in e-form, can be scanned to search and retrieve the required information in no time. Scores of thousands of books can be carried in a small external hard disk or a laptop computer and they can be copied on the other storage devices, Student can store in a pen drive all their textbooks covering the entire syllabus for a semester or even for two years' program.

“Internet and the World-Wide Web have opened up the entire world for the seekers of information. Now we need not depend on the availability of printed books in the traditional libraries. Visiting traditional libraries, searching the right type of book, reading the content, taking notes, etc are now the practice of the olden world.”<sup>7</sup> Internet can give us an access to any library in the world if it exists on a node of the World-Wide Web. The teaching materials posted on the website by a professor teaching in MIT or Harvard can be accessed by a student in India Indonesia or Ireland alike. Thus it helps in reducing the knowledge and skill gap among the regions and the nations and consequently fostering greater equalities in socio-economic and technological opportunities and achievements.

The role of information technology for promoting quality in higher education has been widely acknowledged. Savenije observes: “Modern information technology can and must be deployed to bring the library closer to scientists, teachers and students, in terms of both space and content”<sup>8</sup>. Johnson and Luther observe: “As academic librarians, publishers, authors of research articles and readers of journals well know, journals began a profound and ongoing makeover with the arrival of the World Wide Web. Technological, economic, and human factors are transforming both journals and the broader process of scholarly communication.”<sup>9</sup> They also predict that e-journals are the journals of the future while printed journals will be the things of the past. Higher education system must go along to keep itself abreast with this development.

The National Knowledge Commission (Govt. of India, 2008) acknowledges the importance of information technology for quality in higher education. It recommends the use of modern information and communication technology to meet the changing needs

of the library and information services (LIS) and strengthen the institutional framework of libraries, networking, LIS education, training and research, modernization and computerization of libraries, maintenance of private and personal collections, etc. It proposes that the “catalogues of all libraries should be put on local, state and national websites with necessary linkages. This will enable networking of different types of libraries and setting up of a National Repository of Bibliographic Records and a centralized collaborative virtual enquiry-handling system using the latest information and communication technology (ICT). To enable equitable and universal access to knowledge resources, libraries should be encouraged to create more digital resources by digitizing relevant reading material in different languages, which can be shared at all levels. Peer-reviewed research papers resulting from publicly funded research should also be made available through open access channels, subject to copyright regulations. It is recommended that open standards and free and open source software may be used for the above. It is particularly important to enhance the ICT infrastructure. Website and web based services would improve transparency and accountability. A portal on higher education and research would increase interaction and accessibility. A knowledge network would connect all universities and colleges for online open resources.

### Removing Obstacles to Learning

A variety of software and software based teaching aid are available now. Software can read out the text loudly (if, for example, the text is in the PDF format and the Acrobat reader is used) and thus visually impaired persons can also 'read' the text without the help of Brail or a human reader assisting them. There are a number of software programs that teach mathematical concepts, numerical methods, problem solving and such arts step by step. Certain exercises that earlier were highly labour and time consuming and error prone too, can now be done and redone within no time to get at them.

### Support to Creativity

Teachers can search out on the relevant web sites the reading materials best suited to their students and hyperlink those websites in their own web pages (e.g.

visit <http://www.webng.com/economics>). They can compile, edit, write, illustrate, vocalize and animate the illustrations so as to make the reading materials rich, lively and student-friendly, and post them on web pages that may help not only their own students but the students anywhere in the world. This is being done vigorously in the West, but India is still lagging much behind the more developed and web-conscious nations. Research students can now easily scan through the contents of journals relevant to them. They can contact the experts via e-mail, arrange an e-conference and discuss their findings with them. They can also ventilate their ideas to others and benefit by the comments and observations made by others living far away in the distant lands.

Wikipedia as a means to collaborative learning has been widely acknowledged. **Ebnor** observe that “...wikis are increasingly used for educational purposes. Basically, the most important asset of wikis is free and easy access for end users: everybody can contribute, comment and edit-following the principles of Universal access. Consequently, wikis are ideally suited for collaborative learning and a number of studies reported a great success of wikis in terms of active participation, collaboration, and a rapidly growing content.” Wikipedia presents before us the possibilities of an evolving “*give-and-take*” generation.

### Removing Obstacles to Creativity

One may note that the traditional method of ventilation of one's ideas through printed journals is not only outdated, costly, time-taking and restrictive; it is also so often biased. The referee system does not always work in favour of a healthy development of science. The journals and the referees have their own biases. This bias of the traditional method against putting on record one's own scientific ideas and findings can be overcome by the use of the internet which allows web publishing. Archives that publish working papers on their web pages are also useful.

### Adding to Relevance of Education

Initially land and other natural endowments were the most important sources of social and economic development of the nations/people. After the Industrial

Revolution, manufacturing and therefore physical capital overtook the prominence of agriculture and remained in throne for centuries. However, for a century now, the role of education in shaping development has come into the forefront. Education has been the major contributor to making of the human capital, and thus it has been the most important factor in promoting growth and welfare of the modern society. However, it may be noted that natural endowments and human resources as well as the historical forces together with social institutions of a region/nation determine as to the kind of knowledge which would be more suitable to attain a higher level of development with social well-being. This is to say that different regions/nations have different kinds of knowledge and skills appropriate and suitable to them. The people who can visualize the knowledge and skill requirements of a specific society (intelligentsia) can also plan for a suitable educational policy, write extensively to mould the public opinion in favour of such knowledge and skill, create and disseminate knowledge and give direction to others for creating relevant knowledge. Conventionally it has been done through the printed media and personal contacts. The modern information technology can help in a great way to promote such activities fast and inexpensively with much larger coverage and better appeal. As the impact of television is much more than the older newspaper based or radio-based media, so will be the impact of education if it is based on the modern information technology. Take for example the role of television in spreading health consciousness and exercises based on yoga. It could not possibly have been so effective if it were spread through books and radio programs. Any mode of dissemination of knowledge that engages more number of sense organs to transmit information is more effective than the alternative mode that engages a fewer number of sense organs. A television (or any mode of relaying audiovisual plus textual information together) uses more number of sense organs (eyes, ear, mental capacity to read) than a textbook or a radio broadcast that (often) uses only one of them.

The National Knowledge Commission (Govt. of India) has highlighted the importance of various national web based portals on key sectors such as Water Energy, Environment, Education, Food, Health, Agriculture, Employment, Citizens Rights etc. It has been

recommended that these portals would serve as a single window for information on the given sector for all stakeholders, for students to research and practitioners in the field. The higher education system must tune itself to use these portals to improve and maintain quality in terms of relevance in addressing the technical, social and economic problems.

### **Cost-Effectiveness of IT-based Educational Materials**

Electronic documents (e-books, journal articles, etc) are very easy and inexpensive to search, download, duplicate and distribute. Communication by e-mail is extremely fast and inexpensive. It is easy to arrange e-conferences. Storage of e-materials is extremely space-saving, resource-saving and safe. It is also aligned to the benefits of the paperless economy with far-reaching favourable effects in terms of saving energy and environment.

### **Favourable Effects on Cooperation, Empathy and Compassion**

Partly due to its inexpensive nature and a new "give-and-take" culture emerging due to the spread of the IT-based culture, there is an increased sense of reciprocation, coordination, empathy and compassion among the scholars working in and across different disciplines. Information technology has given rise to the "blog" culture which has proved to be very effective in solving problems of those who participate in it. A participant posts a problem on the 'blog page' and numerous others respond to solve the problem. A new culture of crowd-sourcing is emerging. This culture is based on the premise that the urge to solve the problem of others is not tied with the expectation of any material gain except the satisfaction derived from solving the problems and, occasionally an acknowledgment of appreciation for doing so. "It has also been found that use of IT methods for educational and research purpose promotes the sense of value of time, mutual dependence, reciprocation and cooperation."<sup>11</sup> Although carried out with the expectation of long-run gains, IT professionals and firms provide many software/programs free of cost to the users. It may be noted that while many of us want to read, there are many who aspire for being read. The IT culture has brought them together for gratification of both the

desires. It has also been found that due to increased visibility the e-based reading materials are read and referred more frequently than the print-based reading materials.

## Conclusion

Quality in higher education entails effectiveness of transmitting knowledge and skill, the authenticity, content, coverage and depth of information, availability of knowledge in solving the real life problems, fruitfulness of knowledge in personal and social domains, convergence of content and variety of knowledge over space (countries and regions) and different sections of the people and realization of cost-effectiveness and administrative efficiency. As the information technology has progressed very fast in the last three decades, it has produced equipments at affordable cost and it has now made their wider application feasible. This technology has made search, gathering, dissemination, storing, retrieval, transmission and reception of knowledge easier, faster and inexpensive. Side by side, a vast virtual library vying with the library in prints has emerged and continues growing rapidly. It may be held that the e-libraries are the libraries of tomorrow when the libraries in prints will be the antiques or the archival objects of the past. An effective exploitation of these opportunities created by the recent advancements in information technology may significantly improve quality in higher education.

Quality in higher education also requires effective governance. Unless governance is apt, alert, vigilant, concerned and result-oriented, infrastructural development and availability of reading materials, etc will continue to be sub-optimally utilized. Fortunately, information technology can also be used to strengthen the governance of higher education. First of all, exposure to and working with the modern system based on information technology promote clearer conception of organizational framework. Application of information technology changes the worldview and the mindset of the people. This changed over worldview and mindset goes a long way to systematize the working environment. Knowing is the first step to governing. A clearer conception of the organizational framework promotes building a richer data base, more efficient

retrieval of information as well as apt and timely monitoring. Improved monitoring promotes clarity of objectives and goals as well as the sense of responsibility in the entire system. As a result, quality improvement takes place.

At present most of the institutions of higher learning in India use information technology only nominally. This is reflected in the websites of those institutions. As a matter of fact, many institutions do not have a presence on the World-Wide Web. Those having the said presence, seldom post up-to-date information on the web pages. Information posted on the web pages is skeletal and minimal. None would visit those sites for the second time since there is nothing that may induce one to revisit them. The potentials of websites for educational purpose are unknown to such institutions. Most of institutions have progressed poorly to digitize their libraries. They do not have necessary infrastructure and manifest will to harness the potentials of information technology for improving quality in education. There is no systematic program to sensitize teachers and students to use the modern methods of information seeking and information using. The process of teaching/learning continues to be traditional and mostly ineffective. Courses of studies continue to be outdated and oblivious to the changing needs of the society. Teachers in general do not have any will or commitment either to the discipline they teach or to the problems of the society that need their attention. In many institutions where computers and internet facilities are available, people do not know what to do with them except sending e-mails occasionally and playing games or typing letters frequently. This is a sad affair.

There is a need, therefore, that the institutions of higher learning should organize programs to train the teachers, the office staff and the students to harness the modern advances in information technology to enrich the teaching/learning process so as to improve the quality in education. The training should highlight the possible applications of computers, internet, World-Wide Web, educational portals, websites of reputed institutions, available e-libraries and e-based encyclopaedias, websites that permit a free download of educational materials, useful computer programs and software, etc. Educational institutions should be web-conscious and make their websites so as to be used for educational

purposes rather than posting stale and skeletal information on them as many of them have been presently doing.

#### References

- Agarwal, Pawan, 2007 "Higher Education in India: Growth, concerns and the change Agenda," Higher Education Quarterly, 61(2): 197-207.
- Bhagavan, Manu, 2003, Sovereign Spheres: Princess, Education and Empire in colonial India, Oxford University Press, New Delhi.
- Agarwal Pawan, 2007 op.cit
- Eleventh Five Year Plan 2007-12, (2008) Volume 11, Planning Commission, Govt. of India, New Delhi: Oxford University Press.
- Throat Sukhdeo (2008) "Emerging Issues in Higher Education- Approach and Strategy, University Grants Commission, New Delhi.
- GOI (1999) National Task Force on Information Technology and Software Development: It Action Plan Part III – Long Term National IT Policy .pdf.
- Charlson, Scott and Jeffrey R Young (2004) "Google Digitalisation of Books Project" The Chronicle of Higher Education Today's News, Dec. 14, 2004 <http://chronicle.com/free/2004/12/2004121401n.htm>.
- Savenife, B. (2000), The Future of the Library : The crucial Importance of Accessibility" Available at <http://www.library.uu.nl/staff/saveniigpublicaties/Florence.htm>.
- Johnson, RK and Luther, J. (2007) The E-only Tipping point for Journals: What's ahead in the printing to electronic Transition Zone, Association of Research Libraries, Washington, DC.
- Ebnor, M, Kickmeier-Rust, M and Holzinger, A (2008), "Utilizing Wiki Systems in Higher Education Classes: A chance for universal access?" Universal access in the information society, <http://www.springerlink.com/content/01898k53420-41651>.
- Govt. of India (2008) National Knowledge Commission : Report to the Nation, 2007. Available at [http://www.vn.refer.org/confrasi/conf7/docs/nolwen\\_henaff\\_en.Pdf](http://www.vn.refer.org/confrasi/conf7/docs/nolwen_henaff_en.Pdf).