

An Impact of ICT to Enhance Development Skills of Engineering and Management Students

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Abstract

For macroeconomic growth and socioeconomic stability to occur, skills and expertise are key enablers. The current period is characterized by skill development and ICT (Information Communication Technology). [11] The study discussed the importance, function, and requirement of a programme for developing skills and capacity as a guiding concept in education. Organizations today need a broad range of talents to efficiently carry out complicated company activities. Today's businesses compete globally via the internet as their only or primary trade channel, which has surely increased the need for fresh skill sets. Students must realize that obtaining a business administration bachelor's degree management degree does not guarantee employment. Employers search for certain talents when employing engineering and management graduates in addition to a degree. Based on the kind of job that these students would be expected to do after they join the organisation, these competencies are defined. With the help of ICT, engineering and management students can gain the competencies that engineering and management institutions are looking for, according to this research report.[12] The study will focus on soft skills, communication skills, and entrepreneurship abilities. The approach used in this research combines a review of the literature with a statistical analysis of quantitative data. The article seeks to clarify how ICT could benefit engineering and management students in developing their abilities.

Keywords: Management Institutions, ICT, Communication Skills, Soft Skills, Entrepreneurial Skills, and Skill Development.

Introduction

Information and communication technologies (ICTs) are increasingly being used in education. As a result of it, many areas of people's life have changed. Education institutions, administrators, and teachers have all had to reevaluate their roles in the classroom, as well as their future goals. New obstacles to pupils' access to a high-quality education have emerged as a result of ICT (Saravanakumar, 2014).[17]

ICT for Management and Engineering Education

ICT is simply used in education when it comes to both learning and teaching. It is now a crucial part of the educational process. It has assisted nations in accumulating wealth via the pursuit of knowledge by progressively transforming the educational society into an information and knowledge-based society, or a knowledge economy. It is a state-of-the-art, superior technical method that profoundly affects the educational system. It has altered the governance of educational institutions as well as its general appearance and feel, increased productivity and brought about qualitative changes. The development of education has been, is being, and will continue to be significantly aided by it.[21]

Because it gives students the chance to take on workplace difficulties and refine their own talents in order to build a contemporary viewpoint and a global mindset, engineering and management education is essential for personal development. For tasks requiring professional abilities, students' performance is given more importance. Along with subject-specific work, students should work on developing their communication and teamwork abilities.

Requirement for skills development

Modern organizations in current demanding and rapid technological environment demand a wide range of abilities, including social skills, cognitive, technical, interpersonal, hard & soft skills, and many more, in order to carry out complicated business activities smoothly. In the current digital era, where businesses use the internet as their only or secondary worldwide communication medium, there is a greater need for new skill sets. The country's economic growth benefits from these skill sets. Employers are growing more concerned about the challenges of coping with the rapid developments in technology. They have raised their eyebrows in protest at the latest grads' level of proficiency. [6] According to recent reports, academic students only receive training on technical subjects pertaining to their vocation or discipline, with little to no focus placed on the development of soft skills. As a result of

a shortage of talent and abilities that are marketable, many holders of management degrees are having trouble finding employment. Students must prioritize developing their talents. Because they are so important to students' performance and employability, interpersonal training facilities, both emerging and existing, have a great demand as well as requirement from employers and the public at large. The need of maintaining present educational standards has grown as a result of changing circumstances, and current curricula have been improved through a soft-skills effort. Additionally, these skills would help a student's general personality growth. This will assist students in acquiring strong computational abilities as well as strong communication and problem-solving skills, as well as having the capacity to reveal qualities of leadership, make tactical and long-term plans for accomplishing divisional and organizational goals, make quick decisions in a stressful and constantly changing environment, and establish strong work ethics. Producing the necessary number of highly skilled workers more quickly is one of the primary strategies for fully using our labour resources. (Anjali vyas 2009) [2]

Literature Review

The European Union is moving more and more towards a service-based economy, with an emphasis on the creation and application of ICT. The government encourages citizens of Europe to gain the newest skills necessary for meeting the demands of the work market. To lower unemployment, it may be possible to encourage entrepreneurial abilities in young people by providing specific ICT tools.(European Commission 2007)

Ritika and Richa (2007) Developing business news skills is crucial for management students since it improves their employability. Employability skills are essential for success in the business world. Personal and interpersonal skills will be helpful for management graduates in their interactions with coworkers and other organisations. Graduates in management and engineering will also benefit from these abilities.

According to Padmini (2012), the main obstacle to any

sector's growth is the workforce's inadequate skill set. She has also examined how worth may be generated through good management of knowledge in terms of teaching methods assessment methods, and mechanisms for feedback. She discovered the professional abilities needed by fresh graduates.[15]

Even if management students are fully versed in the academic and theoretical components, Robles (2012) claims that they struggle to function effectively and efficiently because they lack soft skills.

(Bedwell et al. 2013). In higher level management and leadership positions at work, soft competencies like interpersonal interactions, and ability to think critically are crucial.[3]

According to Nishad Nawaz and Krishna Reddy (2013), all universities that offer management programmes must prioritise improving the employability skills of management students. Additionally, it has been claimed that doing this will enhance the cognitive and verbal abilities of MBA graduates.[13]

Kaptan (2014) The study included the significance, function, and requirement of the programme for developing skills and capacity as a principle of educational purpose. Because there are no synergies between businesses and educational institutions in the traditional education system, education must be tailored to meet the demands of the industry and job market. The educational institution must take a proactive role in carrying out the mission.[8]

(Richa and Runma 2017) For management students, skill development is essential in the business climate of today. As their talents advance, School of Management alums will find improved employment prospects. To work in a commercial environment, you need work skills. Graduates of the School of Management are highly valued for their humanities expertise efficiently interact with people inside the company.

(Zarina & Misba, 2017) Future managers in India need to have a certain set of talents in order to do better than the rest of the globe in every area of management. Therefore, each university should work with a variety of staff members to

provide courses that focus on current government programmes like Digital India, Startup India, and Indian Skills.[23]

According to Sanket and Ravan (2016), all graduates of MBA programmes need employability abilities in order to land a job. Khan has come to the conclusion that students need to improve their leadership, interpersonal, and communication skills.[16]

An analysis of current developments in management students' employability abilities and industry-required skills was presented by Banerjee Padmakali and Patter Yogesh Kumar (2016). [5] Researchers arrived to the consensus that the graduate and postgraduate management curricula needed to have altered. Also included in the curriculum should be experiential and action learning. Faculty members ought to be given the chance to increase their understanding of sustainable development.

(Leiden et.al. 2017) The need for qualified engineers is growing, particularly in developing nations like India. In order to meet the growing need for skilled workers, it is necessary to develop skills both inside and outside of the formal educational system. A balance between teaching student's theory and fundamentals and giving them practical experience is necessary to close this gap. The idea of Learning Factories was developed by fusing existing concepts, existing theories, and developing industry concerns. [1]

(SR Girish, C. Suresh Kumar 2017) In their research, they concentrated on the opportunities and problems associated with using ICT for learning and instructions in the classroom. They came across a variety of difficulties, such as exorbitant expenditures, an absence of adequate facilities for the intricate functioning of UT-enabled educational resources, and an inability to satisfy fundamental demands like electricity. In the long run, however, there are prospects for ICT deployment because learning results have greatly increased through their help.[20]

(Dorothy et. al. 2018) Research and problem-solving are intertwined in the engineering profession and educational

system. The effectiveness of the teaching and learning model, which was based on this relationship and derived from the parameters of the research skill enhancement structure, was the subject of the experimental study described in this paper.

(Lillejord et.al 2018) Institutions of higher learning are not effectively utilizing the chances given by modern digital technology, stated to their paper, that recently appeared in Norwegian Higher Education. Although 76 percent of students claimed that online resources give them independence and mobility and are crucial to their academic success, they were found to be used little or never.

Males are more likely than females to use digital devices, according to a study by Händel et al. (2020) that looked into how students used digital devices and how they perceived their own level of e-learning ability. Additionally, it showed that students believe their ICT skills fall short of what is required. Another similar research study by Aristovnik et al. (2020) that included around 30,000 students from various nations revealed that the majority of students looked to lack computer abilities as evidenced by their inability to track their progress and their ongoing struggles to complete the ICT-related activities in their entirety.

Research Methodology

Sampling Design: Data were gathered from the management and engineering students of different institutes from Sangli and Kolhapur district in Maharashtra. 340 respondents provided information, of which 325 were included in the study. 15 samples were rejected because their incomplete responses.

Collection of Data: Through the use of structured questionnaires, data was gathered. Through a review of the literature, the factors were found. The respondents' answers were scored using a 5-point Likert scale, with 1 being strongly agree and 5 being strongly disagree.

Demographic Data: Gender, specializations in management and engineering students, and the type of institution, such as private and Government, are all demographic aspects that were taken into consideration for the study.

Reliability and Validity of Data: According to the analysis, the outcome of Cronbach's Alpha is 0.821. The Cronbach's Alpha result is regarded as satisfactory.

Descriptive Statistics(Tab.No1)

S.No.	Demographics	Numbers		Percentage	
1	Gender	Male	211	Male	65%
		Female	114	Female	35%
2	Specialization	Finance	124	Finance	38%
		Marketing	107	Marketing	33%
		Human R.M.	68	Human R.M.	21%
		Inf. Tech.	13	Inf. Tech.	04%
		Textile	7	Textile	02%
		Others	6	Others	02%
3	Institution	Government	49	Government	15%
		Private	276	Private	85%

Data Analysis

Tab.No2 (Gender Basis)

Group Statistics					ANNOVA			
	Gender	N	Mean	Std. Deviation		Sum of Squares	F	Sig.
Entrepreneurship skills	1	211	14.3112	2.67331	Between Groups	34.107	3.895	.039
	2	114	13.4103	3.12613	Within Groups	1914.672		
					Total	1948.779		
Communication skills	1	211	26.6681	4.71352	Between Groups	5.122	.221	.599
	2	114	26.2623	5.20013	Within Groups	5308.448		
					Total	5313.570		
Soft skills	1	211	18.9423	4.08763	Between Groups	.781	.051	.778
	2	114	18.9812	3.89952	Within Groups	3704.564		
					Total	3705.345		

Hypothesis Test

H01: There is no significant gender difference in how ICT is used to develop entrepreneurial skills.

Tested value after calculation: 0.039. The data in the table above demonstrates that gender has a significant impact on how much ICT is used to foster the growth of entrepreneurial abilities.

H02: There is no significant impact of using ICT to enhance communication skill development on gender basis.

Tested value after calculation: 0.599. It demonstrates that the usage of ICT does not negatively affect communication skills on the basis of gender orientation.

H03: There is no significant impact of using ICT to enhance the growth of soft skills development on the basis of gender.

Tested value after calculation: 0.778. It is clear from the data in the table above that gender has no essential bearing on how effectively ICT is used to enhance soft skills.

Table No.3 (Specialization Basis)

Descriptives					ANNOVA				
						Sum of Squares	Df	F	Sig.
Entrepreneurship Skills	1	124	14.0174	3.32112	Between Groups	101.234	6	2.390	.036
	2	107	13.4098	2.57611	Within Groups	1823.576	319		
	3	68	13.6782	2.95510	Total	1924.810	325		
	4	13	13.9000	2.37512					
	5	7	13.4000	2.89659					
	6	6	14.5700	1.60000					
	Total	325	14.1721	2.81422					

Descriptives					ANNOVA				
						Sum of Squares	Df	F	Sig.
Communication Skills	1	124	28.1333	4.50261	Between Groups	421.232	6	3.758	.003
	2	107	28.2713	4.21962	Within Groups	4691.212	319		
	3	68	29.1230	4.81234	Total	5112.444	325		
	4	13	23.7231	5.86432					
	5	7	28.9000	4.30121					
	6	6	26.3500	1.90012					
	Total	325	26.9557	4.69456					
Soft skills	1	124	20.2123	4.19685	Between Groups	122.362	6	1.415	.179
	2	107	19.1053	4.10587	Within Groups	3569.210	319		
	3	68	18.2541	3.79429	Total	3691.572	325		
	4	13	18.7921	3.70065					
	5	7	19.5000	4.59323					
	6	6	21.1000	2.91006					
	Total	325	19.2781	4.03426					

H04: There is no significant impact of using ICT to enhance the growth of entrepreneurial skills in management students with specializations.

Tested value after calculation: 0.036. It demonstrates the significance of the impact that ICT usage has on the development of entrepreneurial skills in the management specialization.

H05: There is no significant impact of using ICT to enhance the expansion of communication skills among students pursuing management specialization.

Tested value after calculation: 0.003. It demonstrates that the use of ICT in the management specialization has a significant impact on the development of communication skills.

H06: There is no significant impact of using ICT to enhance the development of Soft skills on management specialization students.

Tested value after calculation: 0.179. It is clear from the above tabular value that using ICT in the management specialisation has no significant impact on the development of soft skills.

Table No 4 (Institution Categorization)

Descriptives					ANNOVA				
						Sum of Squares	Df	F	Sig.
Entrepreneurship Skills	1	104	13.6571	3.19821	Between Groups	20.103	1	2.469	.121
	2	221	14.2750	2.70128	Within Groups	1915.182	325		
	Total	325	13.8145	2.91472	Total	1935.285	326		
Communication Skills	1	104	24.9428	4.75011	Between Groups	445.142	1	21.593	.000
	2	221	28.9241	4.49503	Within Groups	4751.160	325		
	Total	325	27.8553	4.80098	Total	5196.302	326		
Soft skills	1	104	18.9152	4.19281	Between Groups	7.912	1	.487	.479
	2	221	19.1620	3.96039	Within Groups	3691.827	325		
	Total	325	19.2175	4.05342	Total	3699.739	326		

H07: There is no significant impact of using ICT to enhance the growth of Entrepreneurship skills on institution categorization.

Tested value after calculation: 0.121. It is clear from the following tabular value that institution categorization has little to no influence on the growth of entrepreneurial skills via ICT.

H08: There is no significant impact of using ICT to enhance the expansion of Communication skills on category of Institution

Tested value after calculation: -0.000. It demonstrates that classification of institutions has a crucial impact on the growth of communication skills via ICT.

H09: There is no significant impact of using ICT to enhance the growth of Soft skills on category of Institution.

Tested value after calculation: 0.479. It demonstrates that categorization of institutions has no appreciable impact on how soft skills are developed via ICT.

Findings and Discussions (Effect of Gender)

It was found that gender determines how ICT enabled resources are used in the growth of entrepreneurial abilities at engineering and management institutions, regardless of the gender of the students or researchers. The investigation discovered that ICT-enabled resources are used by both male and female students to develop their inventive skills. Additionally, it was discovered that men are more inclined to expand their entrepreneurial talents using ICT technologies.

Additionally, it was shown that gender has little bearing on how ICT-enabled assets are used in engineering and management institutions to build communication skills. The investigation discovered that ICT-enabled resources are used by both male and female students to improve their communication abilities. Additionally, it was found that they receive education that is ICT-enabled in order to enhance their writing and communication skills.

Students of all genders believe that ICT aids in the growth of soft skills. ICT-enhanced instruction empowers pupils to stay current and adhere to international norms. ICT supports taking more difficult exams as well as employment and field placement searches.

Effect of Specialization

Specialization's Impact

It has been found that specialization affects how ICT-enabled resources are used to promote entrepreneurial abilities in management institutions. The analysis revealed that, in contrast to the specializations of HR and operations, marketing, information technology, and finance are more utilizing ICT encouraged resources for the growth of entrepreneurial abilities as ICT improves the analytical competency, and additionally directed towards creative thinking methods through e-case research studies.

Additionally, it was shown that different management course specializations have an impact on how ICT-enabled assets are used to build communication skills in management institutions. The study discovered that the specialties of marketing, human resources, and operations agreed that ICT-enabled assets caused an improvement in communication abilities because ICT-enabled assets aid in the improvement of communication capabilities because students' and researchers' connection to educators increases, facts can be easily gathered, and ICT-enabled training improves their verbal communication and drafting skills in comparison to the specialties of finance and accounting. The study also reveals that engineering students have develop good problem solving ability with the help of ICT

ICT aids in the growth of soft skills, according to students in all engineering and management specializations. Students and researchers believe that ICT can help students to develop a more positive outlook on life, boost their self-assurance, and perform better on tests.

Impact of Institution Category

Despite the institute's classification, it has been found that the use of ICT-enabled tools aids in the growth of entrepreneurial abilities in engineering and management institutions. The investigation discovered that both public and commercial institutions use ICT-enabled resources to enhance students' inventive talents. Furthermore, it was shown that through e-contextual analyses, institutes are directed towards developing their students' critical thinking skills.

Additionally, it was shown that the kind of institution has an impact on how ICT-enabled resources are used to enhance communication abilities in management institutes. The study discovered that private educational institutions employ ICT-enabled assets for the enhancement of interpersonal abilities more than government institutes do because ICT alters the way we communicate and provides a substitute for face-to-face conversation.

ICT is thought to aid in the development of soft skills, according to categories of students and researchers at both public and commercial institutions. ICT is said to help people develop their whole personalities, which boosts confidence. ICT-enabled resources made available by both public and private organizations encourage students and researchers to pursue higher education as well as career aspirations and fieldwork.

Conclusion

The usage of ICT has profoundly altered practically all endeavors inside all types of educational organizations for delivering excellent education during the previous two decades. ICT particularly will have a bigger effect on learning in the upcoming years. ICT has become a significant element in the field of teaching both now and in the years to come. There is a critical need for qualified people in the modern, changing globe of business and the job market.

According to the research study's findings, ICT has been shown to have been beneficial in the acquisition of communication abilities and soft abilities on the basis of gender, with male learners using ICT more frequently to build their entrepreneurial skills. Regardless of their area of specialization, students use ICT-enabled tools to strengthen their entrepreneurial and communication abilities. Both public and commercial institutions used ICT to enhance soft skills and the entrepreneurial mindset in the same way.

According to the study's findings, educational institutions need to generate graduates with adequate information technology and other competitive skills in order to match demand and expectations. Students studying business and engineering must also master a number of abilities.

References

- A. Leiden, G. Posselt, V. Bhakar, R. Singh, K. S. Sangwan and C. Herrmann (2018). Transferring experience labs for production engineering students to universities in newly industrialized countries, 8th TSME-International Conference on Mechanical Engineering doi:10.1088/1757-899X/297/1/012053,297, 1-9.
- Anjali Vyas. (2007). A Study of Soft Skills to be instilled within Management Students. Volume 06, Issue 1. ISSN 2349-5138). Pp 1088-1092
- Bedwell, W. L., Fiore, S. M., & Salas, E. (2013). Developing the future workforce: An approach for integrating interpersonal skills into the MBA classroom.
- Ben Youssef A, Dahmani M, Ragni L. (2022). ICT Use, Digital Skills and Students' Academic Performance: Exploring the Digital Divide. *Information*; 13(3):129. <https://doi.org/10.3390/info13030129>
- Banerjee Padmakali and Patter Yogesh Kumar (2016). "Perceived Competencies and Employability Level of Management Students", *International Journal of Engineering and Management Sciences*, Vol. 7, No. 1, pp. 41-45,
- Bhattacharjee, Baisakhi and Kamal Deb. (2016). "Role of ICT in 21st century's teacher education", *International Journal of Education and Information Studies* 1-6.
- Han, H.; Moon, H.; Lee, H. (2019) Physical classroom environment affects students' satisfaction: Attitude and quality as mediators. *Soc. Behav. Personal.* 47, 1–10
- Kaptan, S. S., Dr. May (2014). Skill development and capacity building - Role of educational institutions. *Indian Journal of Commerce & Management Studies*, V(2), 82-84. Retrieved February 24, 2018, from http://scholarshub.net/ijcms/vol5/issue2/Paper_10.pdf
- Kumar Raju. (2008). "Convergence of ICT and Education. "World Academy of Science, Engineering and Technology 40: 556-559.
- Kozma, Robert B. "Comparative analysis of policies for ICT in education." *International handbook of information technology in primary and secondary*

- education. Springer, Boston, MA, 1083-1096
- Mallika Nair, & Vijaya Deshmukh. (2022), ICT IN EDUCATION MANAGEMENT – NEW NORMAL. International Engineering Journal For Research & Development, 7(MGM IOM&R), 5. <https://doi.org/10.17605/OSF.IO/9RESG>
 - Manisha, Anju (2014).The Role of ICT in Higher Education in India. International journal of enhanced research in management and computer application. 3 (11)pp: 16-19.
 - Nawaz M. Nishad and Reddy B. Krishna, (2013). “Role of Employability Skills in Management Education: A Review”, Zenith International Journal of Business Economics and Management Research, Vol. 3, No. 8, pp. 1-6.
 - N.K. Sandhu, “Integration of ICT in Teacher Education”, Transforming Teacher Education in Changing Scenario, Twenty First Century Publications, Patiala. ISBN: 9789380748856.
 - Padmini, (2012).“Education Vs Employability-The need to Bridge the Skills Gap among the Engineering and Management Graduates in Andhra Pradesh”, International Journal of Management and Business Studies, Vol. 2, No. 3, pp. 90-94.
 - Sanket V. Ravan. (2016).“Employability Skills Need of an Hour for MBA Students”, EPRA International Journal of Economic and Business Review, Vol. 4, No. 10, pp.
 - Saravanakumar AR, Jazeel AM (2014). Infusion of ICT Tools for Enhancing the Quality of Teacher Education in Sri Lanka, Proceedings of International Conference on Recent Advances in Educational Technology: Implications and Future Directions, P- 6, Department of Educational Technology, Bharathidasan University, Tiruchirappalli, ISBN 81-909199-9-8
 - Sarkar, Sukanta.(2012).“The role of information and communication technology (ICT) in higher education for the 21st century.”Science1.1 : 30-41.
 - S. Chandha,(2015). “ICT & Present Classroom Scenario, Effectivenessof CAI Programs on the Achievement in Teaching of Social Studies”, E-Learning: A Boom or Curse, Twenty First Century Publications, Patiala,. ISBN: 9789380748870
 - SR Girish, C. Suresh Kumar, (2017).“ICT in Teaching-Learning Process for Higher Education: Challenges and Opportunities.” IOSR Journal of Computer Engineering (IOSR-JCE) pp. 24-28.
 - Thompson, A. D.; Simonson M. R. & Hargrave, C. P. 1996 Educational Technology: A review of the research Washington, D. C: Association for Educational Communications and Technology (AECT).
 - Wuthisatian, R.; Thanetsunthorn, N. (2019). Teaching macroeconomics with data: Materials for enhancing students' quantitative skills. Int. Rev. Econ. Educ., 30, 100151.
 - Zarina & Misba (2017). A study of courses of skill development in management education. Vol (2) Issue 1. ISSN 2456-0960-5138.