

Technology Management in Higher Educational institutions

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Abstract: In the time of economic challenge it is pertinent to maintain the highest standards for higher education and continue to increase the effectiveness of instruction and the depth of student learning. With the explosive growth of knowledge in the past century and with the development of handy tools of **information and communication technologies** there is a need to continuously bring in effective technology management system in its place for faster economic growth. The role of higher educational institutions is to bring in technology and manage the same effectively in their teaching learning process as it has the potential not only to improve quality of education, but also to empower people, strengthen governance and galvanize the effort to achieve the human development goal for the country.

The present paper makes an attempt in understanding the use of technology in teaching learning process of HEIs and role of HEIs in fostering technology and managing effectively for enhancing quality higher education. It is found that effective use of technology in education requires utmost coordination between teachers, students and institutional systems.

Keywords: Technology Management, Higher Education Institutions (HEIs), Higher Education, Quality Education, Effective Management.

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I. Introduction

“We need technology in every classroom and in every student and teacher’s hand, because it is the pen and paper of our time, and it is the lens through which we experience much of our world.”
David Warlick

The advent of digital technology in the last two decades has changed the higher education landscape dramatically. New and emerging technologies have already started to have a transformative effect on higher education system. Technology is driving major changes in the lives of people across the world, impacting every facet of society, and has become an integral part of how people interact and access knowledge and information.

With the swift rate at which the new technologies are developing, higher education also must keep pace with advancements in knowledge and skills for employees to stay relevant. It is crucial for Higher Education Institutions (HEI’s) to equip the students with adequate skills and aptitude to measure up in the increasingly global and competitive economy.

Today, technology-based tools are gaining prominence to impart education to students. Such tools are helping students to learn, communicate, collaborate and study on and off campus promoting academic excellence. These new technologies and approaches to education are already having a clear and positive impact on higher education provision. As technology has become an integral part of everyone’s life, the Indian education landscape has been quick to adopt Information and Communications Technology (ICT) resulting in enhanced learning experience for the learners, paving way for the need of using technology in class room teaching. This transformation is taking the teaching-learning process at universities and colleges to the next level.

Technology Management - Future Outlook

Technology management in a classroom during teaching learning process are the future of higher education offering new pathways. Technology management refers to ways of considering approaches to teaching and learning that enable student choices. Technology-enhanced-learning considers the use of Information Communication and Technology (ICT) in its widest sense to support and improve the learning experience. Thus technology may be considered natural partners – flexible learning can be provided by and supported through technology, while conversely, technology can encourage flexible approaches to the delivery and assessment of learning. The learner-centered approach adopted in HEIs has helped to devise new and

innovative ways to reach diverse learners on one side, and on the other, helped students discover and exercise their distinctive learning styles to chart an educational pathway that is personally meaningful and relevant.

Higher education globally is experiencing a major paradigm shifts in educational practices of teaching and learning. Changes in educational environment have been phenomenal since the last three decades. Technology-based learning (TBL) in the early 21st century is transforming the way students learn in universities and higher educational Institutions. Rapidly changing technology has created new and constantly evolving job types and competencies requiring new skills, it has facilitated significant progress in accommodating the needs of a broader range of students. It can also revolutionize the delivery of education, allowing access to higher education for greater numbers of students at lower cost and with more flexibility. However, for any technology solution to have a transformative impact on student learning and success, it must have as its foundation the specific goals, needs, and interests of the students themselves. While technology can be added to existing structures with the goal of making them marginally more efficient and flexible, technology also offers the opportunity to catalyze more significant reforms to educational structures and practices.

Survey Analysis

A survey was conducted to analyze the perception of students with regard to the core components of Higher Education such as Curriculum revision, Teaching pedagogy, Activity based learning, Computer assisted learning and Evaluation pattern along with opinions on Innovative teaching methodologies and their level of satisfaction with respect to innovative and ICT integrated teaching with the help of a structured questionnaire. A stratified random sampling technique was adopted for selecting 250 respondents (students) pursuing their under graduation in Higher Education Institutions (HEIs) situated in Hyderabad. 220 students responded to the questionnaire. The study sets the following hypothesis to measure the relationship between the perceptions of students at UG level belonging to science, Arts and Commerce streams towards ICT integration in teaching learning process at HELs.

Hypothesis: 1 Perceptions of Students of different faculties do not vary towards ICT integration in TLP at UG level.

H1.a: There is a difference between the perceptions of students with regards to “ICT helps in gaining quality information” among students of different streams.

H1 b.: There is a difference between the perceptions of students towards “ICT integrated learning helps in comparative studies”, among students of different streams.

H1.c: There is a difference between the perceptions of students with regards to “ICT helps in getting latest/relevant data” among students of different streams.

H1.d: There is a difference between the perceptions of students with regards to “ICT’s provide greater flexibility in learning” among students of different streams.

H1.e: There is a difference between the perceptions of students with regards to “I think that ICT’s can improve my learning” among students of different streams.

H1f: There is a difference between the perceptions of students with regards to “Time spent learning on the computer is time well spent” among students of different streams.

Table 1: Students of different streams perceptions to Integration of ICT in Teaching learning Process at UG level in HEIs
ANOVA TEST

		Sum of Squares	df	Mean Square	F	Sig.
ICT helps in gaining quality information	Between Groups	34.248	2	17.124	.551	0.577
	Within Groups	6739.498	217	31.058		
	Total	6773.745	219			
ICT integrated learning helps in comparative studies	Between Groups	6.942	2	3.471	5.193	.006
	Within Groups	145.058	217	.668		
	Total	152.000	219			
ICT helps in getting latest/relevant data	Between Groups	2.424	2	1.212	1.709	.184
	Within Groups	152.476	215	.709		
	Total	154.899	217			
ICT’s provide greater flexibility in learning	Between Groups	7.630	2	3.815	6.514	.002
	Within Groups	123.585	211	.586		
	Total	131.215	213			
I think that ICT’s can improve my learning	Between Groups	1.529	2	.764	.979	.377
	Within Groups	167.902	215	.781		
	Total	169.431	217			
Time spent learning on the	Between Groups	1.061	2	.531	.589	.556

computer is time well spent	Within Groups	195.466	217	.901		
	Total	196.527	219			

H1.a: There is a difference between the perceptions of students with regards to “ICT helps in gaining quality information” among students of different streams.

The above table clearly elicits the analysis of perceptions of students with regard to ICT integration in Teaching Learning Process among different faculty students. The statistics shows the mean square between the groups is 17.124 and within group is 31.058. The F value is 0.55 and asymmetric value (P Value) is 0.557. Since P value is insignificant as it is greater than the level of significance at 5% ($P > 0.05$). Alternate hypothesis is rejected and null hypothesis can be accepted.

H1 b.: There is a difference between the perceptions of students towards “ICT integrated learning helps in comparative studies”, among students of different streams.

The above table explains the perceptions of students with regard to ICT integration in Teaching Learning Process among different faculty students. The mean square between the groups is 3.471 and within group is 0.668 The F value is 5.193 and asymmetric value (P Value) is 0.006 Since P value is significant as it is less than the level of significance at 5% ($P > 0.05$). Alternate hypothesis is accepted and null hypothesis can be rejected.

H1.c: There is a difference between the perceptions of students with regards to “ICT helps in getting latest/relevant data” among students of different streams.

It is clear from the above table that the perceptions of students with regard to ICT integration in Teaching Learning Process among different faculty students. The mean square between the groups is 1.212 and within group is 0.709. The F value is 1.709 and symmetric value (P Value) is 0.184. Since P value is insignificant as it is greater than the level of significance at 5% ($P > 0.05$). Alternate hypothesis is rejected and null hypothesis can be accepted.

H1.d: There is a difference between the perceptions of students with regards to “ICT’s provide greater flexibility in learning” among students of different streams.

The above table clearly elicits the analysis of perceptions of students with regard to ICT integration in Teaching Learning Process among different faculty students. The statistics shows the mean square between the groups is 3.815 and within group is 0.586 The F value is 6.514 and asymmetric value (P Value) is 0.002 Since P value is significant as it is less than the level of significance at 5% ($P > 0.05$). Alternate hypothesis is accepted and null hypothesis can be rejected.

H1.e: There is a difference between the perceptions of students with regards to “I think that ICT’s can improve my learning” among students of different streams.

The above table clearly elicits the analysis of perceptions of students with regard to ICT integration in Teaching Learning Process among different faculty students. The statistics shows the mean square between the groups is 0.764 and within group is 0.781 The F value is 0.971 and asymmetric value (P Value) is 0.377. Since P value is insignificant as it is greater than the level of significance at 5% ($P > 0.05$). Alternate hypothesis is rejected and null hypothesis can be accepted.

H1f: There is a difference between the perceptions of students with regards to “Time spent learning on the computer is time well spent” among students of different streams.

The above table clearly elicits the analysis of perceptions of students with regard to ICT integration in Teaching Learning Process among different faculty students. The statistics shows the mean square between the groups is 0.589 and within group is 0.901 The F value is 0.556 and asymmetric value (P Value) is 0. Since P value is significant as it is less than the level of significance at 5% ($P > 0.05$). Alternate hypothesis is accepted and null hypothesis can be rejected.

Hypothesis 2: Perceptions of Students f different streams (Sciences, Arts and Commerce) do not vary to ICT integration enhances quality in TLP at UG level.

H1.a: There is a difference between the perceptions of students with regards to “ICT brings together students from various geographical areas to share their ideas and views” among students of different streams

H1 b.: There is a difference between the perceptions of students towards “ICTs in education will help to develop a workforce qualified to compete against global competition”, among students of different streams.

H1.c: There is a difference between the perceptions of students with regards to “ICT help learners to solve challenging real life problems better I prefer to learn on my own “ among students of different streams.

H1.d: There is a difference between the perceptions of students with regards to “Learning with ICT requires highly developed study skills” among students of different streams.

H1.e: There is a difference between the perceptions of students with regards to” Internet based learning is a part and parcel of modern learning” among students of different streams.

H1.f: There is a difference between the perceptions of students with regards to “I prefer e-libraries compared to brick and mortar libraries” among students of different streams.

Table 2: Students of different streams perceptions to ICT Integration enhances the quality of Teaching learning Process at UG level in HEIs
ANOVA TEST

		Sum of Squares	df	Mean Square	F	Sig.
ICT brings together students from various geographical areas to share their ideas and views	Between Groups	13.161	2	6.580	8.536	.000
	Within Groups	167.276	217	.771		
	Total	180.436	219			
ICTs in education will help to develop a workforce qualified to compete against global competition	Between Groups	8.942	2	4.471	5.808	.003
	Within Groups	167.058	217	.770		
	Total	176.000	219			
ICT help learners to solve challenging real life problems better I prefer to learn on my own	Between Groups	78.686	2	39.343	1.223	.296
	Within Groups	6785.725	211	32.160		
	Total	6864.411	213			
Learning with ICT requires highly developed study skills	Between Groups	6.835	2	3.417	3.260	.040
	Within Groups	225.386	215	1.048		
	Total	232.220	217			
Internet based learning is a part and parcel of modern learning	Between Groups	.104	2	.052	.085	.918
	Within Groups	132.641	217	.611		
	Total	132.745	219			
I prefer e-libraries for latest data as compared to brick and mortar libraries	Between Groups	2.180	2	1.090	1.092	.338
	Within Groups	216.729	217	.999		
	Total	218.909	219			

H1.a: There is a difference between the perceptions of students with regards to the statement that “ICT brings together students from various geographical areas to share their ideas and views” among students of different streams

Table 2 clearly elicits the analysis of perceptions of students with regard to ICT integration enhances the quality of Teaching Learning Process among students of different streams. The statistics shows the mean square between the groups is 13.161 and within group is 167.276. The F value is 8.536 and asymmetric value (P Value) is 0, Since P value is significant as it is less than the level of significance at 5% ($P < 0.05$). Alternate hypothesis is accepted and null hypothesis can be rejected.

H1 b.: There is a difference between the perceptions of students towards “ICTs in education will help to develop a workforce qualified to compete against global competition”, among students of different streams.

Table 2 clearly elicits the analysis of perceptions of students with regard to ICT integration enhances the quality of Teaching Learning Process among students of different streams. The statistics shows the mean square between the groups is 8.942 and within group is 167.058 The F value is 5.808 and asymmetric value (P Value) is 0.003 Since P value is significant as it is less than the level of significance at 5% ($P < 0.05$). Alternate hypothesis is accepted and null hypothesis can be rejected.

H1.c: There is a difference between the perceptions of students with regards to “ICT help learners to solve challenging real life problems better I prefer to learn on my own “among students of different streams.

Table 2 clearly elicits the analysis of perceptions of students with regard to ICT integration enhances the quality of Teaching Learning Process among students of different streams. The statistics shows the mean square between the groups is 78.686 and within group is 6785.725 The F value is 1.223 and asymmetric value (P Value) is 0.296 Since P value is insignificant as it is greater than the level of significance at 5% ($P < 0.05$). Alternate hypothesis is rejected and null hypothesis can be accepted.

H1.d: There is a difference between the perceptions of students with regards to “Learning with ICT requires highly developed study skills” among students of different streams.

Table 2 clearly elicits the analysis of perceptions of students with regard to ICT integration enhances the quality of Teaching Learning Process among students of different streams. The statistics shows the mean square between the groups is 6.835 and within group is 225.386 The F value is 3.260 and asymmetric value (P

Value) is 0.040 Since P value is significant as it is less than the level of significance at 5% ($P < 0.05$). Alternate hypothesis is accepted and null hypothesis can be rejected.

H1.e: There is a difference between the perceptions of students with regards to” Internet based learning is a part and parcel of modern learning” among students of different streams.

Table 2 clearly elicits the analysis of perceptions of students with regard to ICT integration enhances the quality of Teaching Learning Process among students of different streams. The statistics shows the mean square between the groups is 0.104 and within group is 132.641 The F value is 0.085 and asymmetric value (P Value) is 0.918 Since P value is insignificant as it is greater than the level of significance at 5% ($P < 0.05$). Alternate hypothesis is rejected and null hypothesis can be accepted

H1f: There is a difference between the perceptions of students with regards to “I prefer e-libraries compared to brick and mortar libraries” among students of different streams.

Table 2 clearly elicits the analysis of perceptions of students with regard to ICT integration enhances the quality of Teaching Learning Process among students of different streams. The statistics shows the mean square between the groups is 2.180 and within group is 216.729 The F value is 1.092 and asymmetric value (P Value) is 0.338 Since P value is insignificant as it is greater than the level of significance at 5% ($P < 0.05$). Alternate hypothesis is rejected and null hypothesis can be accepted

Technology Management in Teaching learning Process

- Integration of ICT in teaching learning process is the need of the hour. The higher education landscape is undergoing significant change in today’s globalised economy. And hence effective use of technology is the only way for quality enhancement in education.

The following methods need to be adopted by HEIs

1. Extensive use of E-learning resources
2. Usage of apps and developing apps by the facilitator.
3. Use of Power boards in classes
4. Use of Google Classroom
5. Google class rooms
6. Google assignments
7. Google Quiz
8. Use of curated apps
9. Development of apps to supplement classroom teaching
10. YouTube lectures
11. Skype – webinar
12. E album
13. Virtual labs
14. Blogs
15. Use of style sheets for mini Projects
16. Flipped class rooms
17. MOOCs

An essential element for envisioning the HEI’s future in the information age is to recognize the parameters which determine the quality in Higher Education. A teacher should innovate and understand the target group before finalizing the methodology he intends to adopt for effective teaching learning process. The success of any method basically depends on availability of adequate trained personnel, proper planning of the teacher, understanding the level of competencies of learner, ensuring the availability and proper use of technology, integrating academics with ethics. This enables the learner to inculcate the quest for knowledge, ensures a learner to be a lifelong learner in pursuit of excellence. Creativity of the teacher in using innovative teaching pedagogy is a right move towards quality sustenance and enhancement in Higher Education in India.

II. Conclusion

The success of any innovative pedagogy basically depends on availability of adequate trained personnel, proper planning of the teacher, understanding of the level of competencies of the learner, ensuring availability & proper use of technology, and integrating academics with ethics.

In this era of information age, students need to play an active role in their learning process and determine how to reach their desired learning outcomes on their own. This approach empowers them to build their knowledge and enables them to think critically, work in teams and solve problems collectively and demonstrate positive attitude towards life-long learning.

The authors are of opinion that a day is not too late where we can find Indians seeking higher education in India instead of migrating to advanced countries but also the learners from all other countries would come to India seeking higher education with the implementation of flexible pedagogies and technology enhanced teaching in HEI's.

Finally would like to conclude with John Dewey's quote "...if we teach today as we taught yesterday, we rob our children of tomorrow."

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