

STUDY ON INVOLVEMENT OF TECHNOLOGY IN HIGHER EDUCATION TO ENHANCE THE TEACHING LEARNING PROCESS THROUGH ERP SYSTEM

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ABSTRACT:

The purpose of this paper is to study the involvement of ERP in higher education from various institutes affiliated to different Universities, to enhance the teaching learning process. An innovative adoption perspective is used to examine the research question, focusing in particular on how an ERP supports universities in their innovations. In addition to reviewing the existing literature, the research methodology included a survey of faculty members from different colleges across different universities. There have been significant efforts made by universities and government agencies to improve the quality of higher education. Due to the many changes occurring in higher education, colleges must reassess their strategic direction. There are many factors to consider here, including the characteristics and patterns of distinct processes, the increasing competitiveness and the constant innovation in the teaching and learning processes. Using automation to simplify a complex offering can reduce manual work in repetitive tasks, which will allow faculty and administration to concentrate on providing students with a better learning experience.ERP can accelerate the growth and success of Higher Education Institutions

(HEI) by enabling automation in a significant way. The findings of the study revealed that the use of ERP systems is gaining more appeal and acceptance for use in Higher Education Institutions.

Key words: Higher Education, Technology, ERP systems, Involvement.

1. INTRODUCTION:

During the present age of technology, automation is becoming more and more critical when it comes to the information of an organisation. Once an organisation decides to upgrade its technology, the first step is to move from manual work to automation, then ERP is the suitable solution for this upgrade.

The use of Enterprise Resource Planning (ERP) systems, which are widely accepted and successful in private businesses and industry, is presently gaining more appeal and acceptance for use in colleges and universities.

2. NEED:

An education ERP can enhance processes across your education institution, helping to automate and improve workflows. It can also be leveraged to measure and improve the student experience, standardise communication between the institution and students, and even monitor attainment levels.

Automation of workflows across disciplines using education ERPs reduces reliance on ineffective manual processes and reporting. With the challenge of ever-increasing targets, manual administration can be time- and resource-intensive. An education ERP offers a solution to automate and customise these procedures.

3. REVIEW OF LITERATURE:

3.1: Evolution of ERP Systems

In the late 1980s and the beginning of the 1990s new software systems known in the industry as Enterprise Resource Planning (ERP) systems surfaced in the market targeting mainly large complex business organisations. These complex, expensive, powerful, proprietary systems are off-the-shelf solutions requiring consultants to tailor and implement them based on the company's requirements. In many cases they force companies to reengineer their business processes to accommodate the logic of the software modules for streamlining data flow throughout the organisation. These software solutions, unlike the old, traditional in-house-designed company specific systems, are integrated multi-module commercial packages suitable for tailoring and adding "add-ons" as and when required.

3.2:What is ERP software for Education?

ERP software can be used in educational institutions to manage all daily chores such as administrative work, the teaching and learning process, curriculum management, student attendance, student information, fee record management, and assignment management. With ERP software, all interested parties can access a consolidated dashboard view that compiles all the pertinent data. Additionally, having real-time access to information about students' achievement, attendance statistics, and future events allows parents and instructors to keep informed, improving communication between the school, parents and other stakeholders.

ERP systems tie together a multitude of processes and enable the flow of data between them. By collecting an institution's shared transactional data from multiple sources, ERP systems eliminate data duplication and provide data integrity.

3.3:ERP fundamentals

ERP systems are built on a single, predefined data structure (schema), which usually has a shared database. This makes it possible to guarantee that the data utilised throughout the company is

standardised and founded on typical user experiences. The workflows across business departments (such as finance, human resources, engineering, marketing, and operations) that are driven by these fundamental components are then connected to systems and the users of those systems. Simply said, ERP is the means through which a modern organisation integrates its people, processes, and technologies.

ERP makes it simpler to gather, organise, analyse, and distribute this information to every person and system who needs it to best carry out their tasks and responsibilities because data is indeed the lifeblood of every modern enterprise.

4. SCOPE:

ERP systems for Education have emerged as the game-changer empowering the management, administration and teachers and upgrading the campus like never before.

How does ERP system benefit HEI'S?

ERP for educational institutions offers a wide range of benefits, which include:

- Quick data access

An ERP system manages enormous volumes of data effectively and safeguards the information of stakeholders, including stakeholders, alumni, students, and faculty members. As a result, data can be retrieved rapidly. Because everyone in the institution utilises the same system, there are no disagreements and information flows smoothly.

- Improved Workflow and Efficiency

Institutions of higher learning are responsible for a wide range of tasks, including admissions, instruction, assessments and administration. By reducing paperwork, an

effective ERP system for higher education institutions simplifies all these activities. Any employee may quickly find the needed information or document since a single system is used to hold data from several institute branches.

- Automated Processes & Better Control

Administrative and academic tasks are automated using ERP, which improves efficiency and gives better control over all procedures. HEIs benefit from the digital transition by growing quickly and excelling more.

- Reduces administrative hassles

Everything that can be computerised, from student acceptance to report generation, saves human labour and minimises errors. With the use of this system, time-consuming processes like recording attendance, making schedules, producing reports, and sending emails or messages can be automated. Even helpful reports for teachers and non-teaching staff can be generated with a single click, saving valuable time.

- Data security

With role-based access in ERP, the data remains secure. You can choose to share and hide certain data with different stakeholders and as everything is online, there's no fear of losing out on important data and records.

ERP systems hold the promise of improving business processes and decreasing costs (Nah et al.2001; Beheshti 2006), as these systems facilitate communication and coordination, centralise administrative activities, improve ability to deploy new information system functionality, and reduce information system maintenance costs[1]

5. Problem statement:

It has been identified that automation in Higher Education has an important role to play in various areas like academics, administration, examinations and so on, all of which are a part of the teaching and learning process. In this article, we will examine the benefits and enhancements of incorporating technology into the teaching and learning process.

[1].https://www.researchgate.net/publication/325498936_Identifying_Critical_Success_Factors_of_ERP_Systems_at_the_Higher_Education_Sector

6. Objectives:

1. To study the need and benefits of ERP implementation in various areas in Higher Education Institutions to enhance the quality of the teaching learning process.
2. There is a rapid growth happening in technology and the application of technology has become a basic necessity in each and every sector. In order to achieve an all-round development, education takes first and foremost place.
3. To enhance the quality of education being provided to students.
4. To improve the functioning of various departments of Higher Educational Institutions.
5. To study the effect of ERP implementation in Higher Education Institutions.

7. Research Questions:

1. Which of the following environments suits your institution?
2. Is your institution currently following the ERP or Traditional methodology for teaching learning process?
3. Do you think it is necessary for any educational institution to adopt and implement technology which smoothens the entire teaching learning process?
4. Can an educational institution actually become efficient post implementation of ERP?
5. ERP plays a key role in Higher education to maintain quality in the teaching learning process.
6. Which areas do you feel can be successfully accomplished after the implementation of ERP?

8. Hypothesis:

H0: Null Hypothesis: The involvements of technology innovations like ERP not effective to enhance teaching learning process in Higher Education

H1: Alternative Hypothesis: The involvements of technology innovations like ERP are strongly effective to enhance the teaching learning process in Higher Education.

9. Methodology:

A general sample survey was conducted among faculties involved in Higher Education. A total of 84 responses received from all the teachers are associated and currently working with the Higher Education Institution and the colleges are affiliated with different universities across India.

To test the involvement of technology in Higher education to enhance the teaching learning process through ERP systems we have chosen χ^2 - square goodness of fit test.

Chi Square can also be used to determine whether a certain model fits the observed data. These tests are conducted by calculating the significance of sample deviation from the assumed theoretical (expected) distribution. This can be performed on cross tabulations as well as on frequencies (one-way tabulation)

The formula for same Chi square test is as follows:

If $r=2$ and $s=2$ we get 2×2 contingency table which can be represented as follows

The formula for Chi square will be as

$$\chi^2 = \frac{(\square\square - \square\square)^2}{\square_1 * \square_2 * \square_1 * \square_2}$$

H0: Attributes A and B are independent

And under the assumptions i) $N > 50$ ii) $a, b, c, d > 5$

Here the degree of freedom will be 1.

Decision Criterion with level of significance= α is given by

Reject H_0 if $\text{cal } \chi^2 > \text{tab } \chi^2 (1, \alpha)$

Accept H_0 if $\text{cal } \chi^2 < \text{tab } \chi^2 (1, \alpha)$

10. DATA INTERPRETATION & FINDINGS:

Q1) Which of the following environments suits your institution.

Contingency table:

Table 1:

Two classifications are presented in the table below, specifically technological and non-technological environments in order where the Higher Education system was adopted

Cross tabulation			
	Within Mumbai	Out of Mumbai	Total
Technological environment	46	22	68
Non-technological environment	6	10	16
Total	52	32	84

$$\chi^2_{(1,0.05)} = 3.84 < \chi^2_{(1,0.05)} = 4.99$$

So according to chi square decision criterion, we reject H_0 at 0.05 level of significance.

Q2) Is your institution currently following the ERP or Traditional methodology for teaching learning process?

Contingency Table

Table2:

To check whether the higher education institutions follow what type of methodology in order to smooth out the work among all faculties, data has been collected through sample surveys across India from cities like Chennai, Hyderabad, Warangal and Mumbai.

Cross tabulation			
	Within Mumbai	Out of Mumbai	Total
ERP Technology	35	13	48
Traditional Methods	17	19	36
Total	52	32	84

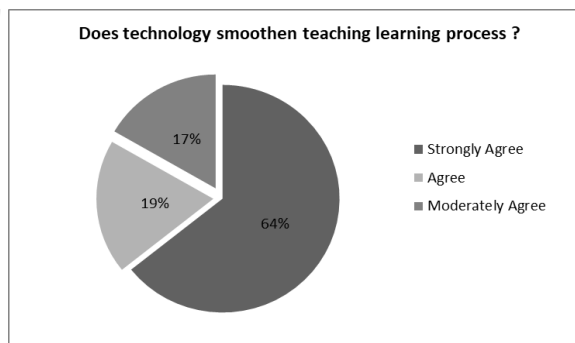
$$\chi^2_{(1,0.05)}=3.84 < \chi^2_{(1,0.05)} = 5.759$$

So we reject H_0 at 0.05 level of significance as per the decision criterion of Chi-square test.

Q3) Do you think it is necessary for any educational institution to adopt and implement technology which smoothens the entire teaching learning process.

Interpretation:

Does technology smoothen the teaching learning process		
	Frequency	Percentage
Strongly Agree	54	64%
Agree	16	19%
Moderately Agree	14	17%
Disagree	0	0%
Total	84	100%



Out of 84 samples, 64%, or 54 out of 84 samples, strongly support the integration of technology into higher education. Despite the data showing that various levels of acceptance of automation exist in various percentages, such as 19% and 17% agree and moderately agree. Based on the

table, it can be concluded that the majority of data strongly agrees that automation should be adopted and implemented by every higher education institution.

Q4)Can an educational institution actually become efficient post implementation of ERP?

Table3:

To test the efficiency of post implementation of ERP the below data is obtained from primary data through sample survey.

Cross tabulation			
	Within Mumbai	Out of Mumbai	Total
Yes	42	23	65
No	7	12	19
Total	49	35	84

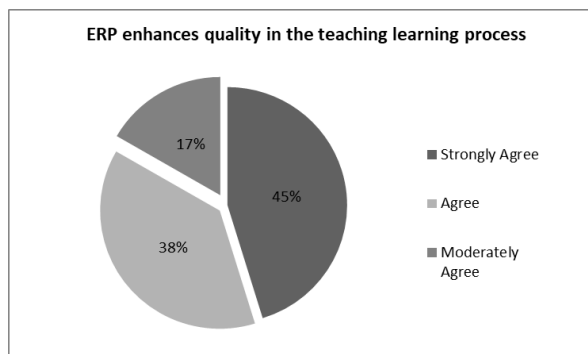
$$\chi^2_{(1,0.05)}=3.84 < \chi^2_{(1,0.05)} = 4.666$$

So we reject H_0 at 0.05 level of significance according to the decision criterion of Chi square test.

Q5)ERP plays a key role in Higher education to maintain quality in the teaching learning process.

Interpretation:

ERP enhances quality in the teaching learning process		
	Frequency	Percentage
Strongly Agree	38	45%
Agree	32	38%
Moderately Agree	14	17%
Disagree	0	0%
Total	84	100%



45% of 84 samples, or 53 out of 84 samples, strongly suggest that the role and impact are greater when HEIs integrate technology to improve teaching and learning. In spite of the data showing that various levels of acceptance of automation exist in varying percentages, for example 38% and 17% of respondents agree and moderately agree. In conclusion the table indicates that the majority of data strongly agreed that technology will smooth the entire teaching process.

11. Findings:

1. As per Chi-square test , table 1 shows the inference that technological innovations in higher education make a strong effectiveness in order to improve the quality of teaching learning process.
2. The result of table 2 as per Chi-square test it provides that the usage of technology strengthens the workforce among all faculties irrespective of location or region. It is suggested that improving the technical oriented environment in the teaching learning process rather than increasing the manual work methodologies.
3. From the table 3 as per Chi-square test, there is a strong recommendation from all the faculties that various educational institutions are showing drastic changes and improvements in their academic education with the implementation of ERP.
4. Below are the Conclusions drawn from the above data analysis:

	χ^2_0	χ^2_1
Table 1	Reject	Accept
Table 2	Reject	Accept
Table 3	Reject	Accept

12. Conclusion:

As per the conclusions drawn from the above table using Chi-square test we are to reject the null hypothesis that the involvement of technology innovations like ERP is not effective to enhance the teaching learning process in Higher education.

It leads to the strong appeal that the involvements of technology innovations like ERP are strongly effective to enhance the teaching learning process in Higher Education.

13. Future study:

80% of the respondents are of the opinion that ERP can be successfully implemented in various areas like academic process, administrative process as well as examination process. Majority suggest that involving technology in the teaching learning process is the need of the hour and can be a game changer in higher education. However, some academicians recommend to strike a balance between the traditional and technology enabled methods and also suggest considering the pros and cons before introducing ERP in education. Financial costs and ease of using the systems were some of the concerns raised but findings show a strong belief that every school and colleges should be ERP enabled. In the future we plan to do a further study of the impact of technology in specific areas like attendance, teaching learning process, administrative process as well as the examination process.

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