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Research Paper

# Importance of Six Sigma Implementation in Universities with Reference to Jntuh Hyderabad

Management

**KEYWORDS :** Education, Quality Tools, Six Sigma, Undergraduates

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## ABSTRACT

*Engineering education has an ability to turn the earth in to a paradise. It plays a vital role in the social and economic development and well-being of the nation. Presently in India, private engineering educational institutions are mushrooming without sustaining required level of quality. In the early years of 20th century, India had just six engineering colleges. The total number of institutions imparting engineering education at the degree level was only 44 in the year 1947. But in the last two decades of the 20th century, there has been a dramatic increase in the establishment of number of engineering colleges in the country. Currently in India, there are more than 2,300 engineering educational institutions and the intake of students has gone above 8 lakhs. Comparatively more number of colleges established in the southern India. The growth rate of engineering institutions in the recent past in India has been phenomenal and the problems associated with this growth are also very high.*

**Introducztion:**

The Greek symbol σ (sigma) denotes "standard deviation" - a statistical symbol and metric of process variation and it has several meanings. The literature on six sigma reviews that, in the late 1800s, Carl Frederick Gauss (1801) introduced the concept of a normal curve. In 1920s, Walter Shewhart proved that three sigma from the mean is the point where a process requires correction. During the mid of 1980s, Bill Smith, a Motorola engineer, explained that Six Sigma is the optimum level to balance quality and cost.

**Application of six sigma in Educational institutions:**

The following are some of the common processes in the educational institutions which can be significantly improved by applying the six sigma methodology:

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- Student Admission Procedure
- Academic achievement
- The process of University Administration regarding student evaluation system and grading system
- Teaching and academic programs and pedagogy
- Study program and process
- Institutional effectiveness
- Student learning performance

**Review of Literature**

Al-Rihani (2010) study, which aimed to identify the possibility of applying Six Sigma's principles in the school management and the constraints facing the school principal to apply the principles of Six Sigma and the relationship of experience, qualification, type and level of education factors and educational stage with a potential of the application of Six Sigma form by school administrators in the State of Kuwait, the sample consisted of (257) Directors that are representatives of all levels of education in all schools in Kuwait, the study used a descriptive approach, the results of the study indicated the existence of some quality systems for schools administrators, and they have a good knowledge to apply it in their school's administration, and have the potential and the necessary powers to implement the model for the Six Sigma mechanism in their schools, also there are many obstacles that do not facilitate the use of Six Sigma such as the traditional understanding of education by the leadership of the ministry and the limited powers and the large workload of the director.

Jenicke (2008) study aimed to examine the challenges of the application of Six Sigma methodologies in educational and academic field, he improved a framework for enhancing the Six Sigma mechanism using an academic performance indicators associated with it in a pyramid scheme in line with the academic corporations levels, and therefore they suggested a model of strategic objectives and performance indicators according to the performance implications of the DMAIC model. The results indicated that the characteristic system of the academic corporation can be benefited from the Six Sigma mechanisms, the results show that the proposed system of Six Sigma can be used by different educational systems, such as administrators, faculty and students, the existence of a difference between the academic and economic environment make some difficulties in the application of Six Sigma in the academic field.

In the contest of globalization, education systems have gone through radical changes. Today higher education has become commercial enterprise and is treated as marketable commodity. Many institutions and universities throughout the world are preparing for marketing their educational products and services. Day by day the competition from various institutions and universities is mounting up. Quality of education is going to be of foremost importance in all further higher education. Apart from quality there are other challenges faced by institutions. This paper focuses on the teaching function in an institution. Teaching in any area involves multiple activities such as course plan design, curriculum development, learning objectives of individual courses, classroom instruction, laboratory exercises and student learning assessment etc.

**Methodology:**

This chapter will explain about the study methodology like sample, sample size and sampling technique for the proposed study, contains objectives and Hypothesis of the study and significance. Also reveals data collection methods and tools for collection, followed by methods of data analysis to conclude meaningful outcome of the study.

**About JTUH**

Jawaharlal Nehru Technological University Hyderabad (JNTUH) is a well established UGC approved University in 1972 and one of the eminent Institute in India, and known for benchmark university in Technical education system with more than 400 affiliated engineering colleges located inTelangana State.

**Objectives**

1) To know the six sigma importance in general and Education sector in particular.
2) To know the level of transparency in all university proce-

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dures and environment.
3) To design and maintain quality teaching and academic programs.

**Hypothesis**
1) $H_{01}$: There is no significant association between designation/ Course and their opinions on entrance test schedule
2) $H_{02}$: There is no significant association between designation/ Course and their opinions on counseling schedule and process
3) $H_{03}$: There is no significant association between designation/ Course and their opinions on quality of faculty

**Sample** : For the purpose of students survey, students from both university campus and more than 300 affiliated colleges students perceptions was captured by using structured questionnaire along with some faculty and administrative people views also recorded.

**Sample Size:** A total of 500 respondent's opinions was collected for the purpose of this study.

**Data Analysis**

**$H_{01}$**: There is no significant association between designation/ course and their opinions on entrance test schedule

| **Chi-Square Tests** | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 27.721[a] | 12 | .006 |
| Likelihood Ratio | 30.884 | 12 | .002 |
| N of Valid Cases | 328 | | |
| a. 8 cells (40.0%) have expected count less than 5. The minimum expected count is .53. | | | |

From the above table chi square is significant (sig. value is < 0.05), reject null hypothesis. It means that there is a significant association between designation and their opinions on entrance test schedule

**$H_{02}$:** There is no significant association between designation/ course and their opinions on counseling schedule and process

| **Chi-Square Tests** | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 24.658[a] | 12 | .017 |
| Likelihood Ratio | 28.216 | 12 | .005 |
| N of Valid Cases | 324 | | |
| a. 7 cells (35.0%) have expected count less than 5. The minimum expected count is 1.25. | | | |

From the above table chi square is significant (sig. value is < 0.05), reject null hypothesis. It means that there is a significant association between designation and their opinions on counseling schedule and process.

**$H_{03}$**: There is no significant association between designation/ course and their opinions on quality of faculty

| **Chi-Square Tests** | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 38.026[a] | 12 | .000 |
| Likelihood Ratio | 39.563 | 12 | .000 |
| N of Valid Cases | 328 | | |
| a. 7 cells (35.0%) have expected count less than 5. The minimum expected count is 2.48. | | | |

From the above table chi square is significant (sig. value is < 0.05), reject null hypothesis. It means that there is a significant association between designation and their opinions on quality of faculty.

**Discussion of Results:**

Teaching is one of most important aspect in achieving all above defined goals and objectives. From the survey it is found that the quality of the faculty was average in all colleges including campus and method of teaching also like miller job. This notion to be corrected and new pedagogy need to be introduced to teach more effectively to the students. With reference to doubt clarity students are happy with faculty response. Nearly 60% of affiliated colleges are suffering with poor lab equipments, where some colleges are not at all purchased and some are kept like show case. In this regard university lab's are good and well conditioned. Most of the colleges are completing syllabus in time but with low quality and clarity. Very few colleges are following Industry interaction practices, which lack with the students when they face interviews after completion of courses. Nearly 65 percent of colleges are maintaining dummy registers with respect to student attendance and very few colleges are following periodic review of faculty, in this even campus colleges also lacking. Only 10% of colleges are following industry tours to student for better practical imposture, and very often they are conducting seminars.

The higher education process showed a three sigma (3σ) level quality that requires significant improvement to achieve six sigma (6σ) level. The primary objective of higher education is student success through higher quality education where failure of any student may be considered as a defect in the process. Due to variability in the process such as different type of instruction

by different professors, a variation of quality exists. Variations of quality may be due to lack of understanding of how students learn and adapting to different learning styles of students. After identification of the issues and defining the problems, a solution can be developed using six sigma approaches and models should prepare by university authorities. A control chart can be used with UCL and LCL along with a continuous improvement plan to improve the higher education process. This will result in higher quality and sustainable process in the institution with higher levels of student satisfaction and success rates such as graduation and retention rates.

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