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# Application of Six Sigma in the Management of Indian Tertiary Education Institutions

*Padma Shankar\**

## *Abstract :*

*Six Sigma is a systematic innovative activity focusing on process improvement. Education sector is the tertiary service sector having process and systems combined through the technology. The improvement of process can be accomplished by the DMAIC process in the tertiary education institutions. This has been applied successfully in many industries through out the world. Well known Indian companies have also applied this technique to improve delivery systems. The researcher in this paper has attempted to analyze the possibilities of applying this technique to meet the global challenges by the Indian higher education system.*

## **Introduction:**

Six Sigma (6  $\sigma$ ) means a systematic innovative activity to statistically measure and analyze the causes of the defects that happen in all parts of management and then remove those causes. It can be applied to all service industries. To achieve 6  $\sigma$  means, a process must not produce more than 3.4 defects per million opportunities. The fundamental objective of the six sigma methodology is the implementation of a measurement strategy that focuses on process improvement and variation reduction. This is accomplished through the use of DMAIC (pronounced as De-May-Ick) process. DMAIC is an acronym of five interconnected phases:

**Define:** What problem needs to be solved?

**Measure:** What is the capability of the process?

**Analyses:** When and where do defects occur?

**Improve:** How can process capability be improved by 6  $\sigma$ ? What are the vital factors?

**Control:** What control needs to be put in place to sustain the gain?

The DMAIC process of 6  $\sigma$  has advantages to measure problems, stay focused on students (the customers) verifying the cause with fact in breaking old system, undertaking risks, measuring the results and sustaining the change in an educational institution.

Defining a problem requires listening to the students' problems, because ultimately the effectiveness of a system in an educational institution depends on satisfying them. Implementing 6  $\sigma$  requires a positive attitude, and recognizing the opportunity to accept change in the organization. In the 1980's, Motorola came up with this idea to combat threat from its Japanese counterparts. 6  $\sigma$  is a registered service mark and trademark of Motorola who had reported US\$17 billion in savings from its implementation as on 2006. Bank of America, Caterpillar, Honeywell

*\*Ms Padma Shankar, HOD, Department of Commerce, Faculty of Science and Humanities, SRM University, Kattankulathur -603203, Kancheepuram, Tamil Nadu  
email: padmashankar@live.com*

International, General electric, Ford, 3 M are some of the organization that have adopted 6 ó for business transformation and have succeeded. To name a few Indian companies who have adopted this techniques are Wipro, Maruti Udyog, Godrej, Bajaj Auto, and Hero Honda. Identifying the critical areas such as programmes offered; effectiveness of the academic delivery system; identifying defects and habitual process; integrating the information system and focusing on large scale cost reduction; analyzing and suggesting changes for the business transformation and strategic improvement are the key factors. The Six Sigma philosophy which has worked wonders in an industrial environment, needs to be introduced in the Indian Higher Education Sector in the wake of disturbing reports about the quality of graduates, says a human resource consultant lamenting that in most of the higher education institution, Principals and Deans are bogged down to administrative work giving little time to pay attention to academic excellence (The Hindu, 2006).The researcher in this paper has attempted to analyze the possibilities of implementing six sigma techniques to meet the global competition by the Indian higher educational system.

**Objectives of using 6 ó:**

The objectives for using 6 ó in various leading organization were as follows:

- Six Sigma is one of the strategy and tool which leading organizations have started using to achieve accuracy and speed and at the same time reduce cost and increase customer satisfactions and profits.
- Six Sigma's target is to achieve less than 3.4 defects or errors per million opportunities.
- Six Sigma's is deployed strategically to change the culture of the organization by inculcating process control discipline.

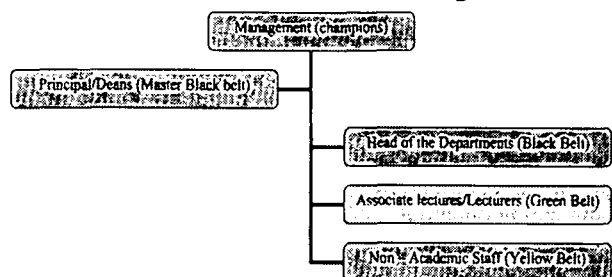
The issue is no longer whether Six Sigma's should be considered or not, but the question is when or how, since an organization cannot do today's job with yesterday's methods and be in business tomorrow. 6 ó simply means a measure of quality that strives for perfection. It is disciplined as a data driven approach and methodology of eliminating defect in any process. It is an organizational philosophy in establishing the belief in "doing things right, first time and every time". The formula for Six Sigma is Quality (Q) multiplied by

Acceptance (A) = Effectiveness (E). Six Sigma represents standard deviation (a measure of variation) of a population in statistics. The underlying principle of Six Sigma is that if one has 6 standard deviations between the mean and the nearest specification limit then there will be practically no items that fail to meet the specification.

**Organization structure of educational institution applying Six Sigma:**

The Six Sigma hierarchy adopts martial arts terminology to describe its structure. Executive Leadership at the top sets up the vision and empowers others with the freedom and resources to explore new ideas for breakthrough improvements. Champions are the key management sponsoring the entire team to stay aligned with the institution vision and mission providing resources at appropriate time and negotiating conflicts. The Head of the institution/ Principal – Master Black Belt — is a coach and mentor ensuring that the Black Belts are in their right track, providing advice, sustaining the change, reducing cost and providing student delight. Master Black belt are expert in-house coaches ensuring deployment of Six Sigma across departments and functions. The Head of the department – Black Belt- is a full time committed person capable of tackling critical change opportunities inspiring the team by building confidence. Their primary focus is on Six Sigma project execution. The Associate professors/Lectures with green belt are the team members who incorporate new methods into the day to day activities of the institution. These green belt employees operate under the guidance of Black belts to achieve results. The yellow belts are well trained in the Six Sigma. The non teaching staff adorning yellow belt are the facilitators providing free flow of information and other resources for the smooth functioning of an educational institution.

**Figure showing the structure of educational institutions based on Six Sigma**



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### Problems identified in educational institutions:

- ✓ Lack of quality faculty members. Teaching is considered as the last resort of occupation due to the less remuneration offered by educational institution – particularly those that are privately owned.
- ✓ Suppression of knowledge by senior faculty, groupism and imbibing politics inside academic institution among faculty members and students.
- ✓ Lack of proper infrastructure facilities.
- ✓ Delay in obtaining financial resources.
- ✓ Lack of basic and standard safety measures in laboratories and the campus of the educational institutions.
- ✓ Delay in delivery of transcripts, scholarships and other students' requirement due to inadequate non teaching staff or lack of necessary information.
- ✓ Insufficient library books or updated journals.
- ✓ Failure to adhere to syllabus or relevance of syllabus and lack of scope to exhibit originality through research.
- ✓ Communication problems within the institution between the institution office and the various departments.
- ✓ Lack of opportunities for enhancement of academic knowledge for faculty members.
- ✓ Improper maintenance procedure.
- ✓ Lack of follow up.
- ✓ Lack of industry connectivity.

### Performance evaluation of faculty :

Faculty members are very sensitive to their performance evaluation measures. They bribe the students' to give the best feed back or the feedback is

obtained from favorite students. They also have "who are students to assess us" attitude. Implementing qualitative and quantitative measurements are not possible in assessing the subject knowledge abilities of teachers. Jack Welsh model of "differentiation" illustrated in his book "Winning" may be implemented. The top 10 may be rewarded by giving them important designation in the academic institution. The mediocre 70 may be provided avenues for improvement and the lower 10 may be shown the exit. The educational institution creates knowledge and intellectual capital where there can be no place for the under performers. An educational institution after identifying the problems and measuring it must strictly implement the improvement measures to become world class institution.

### Important Components for implementation:

The educational institution needs to have the following inbuilt important components:

- The educational institution should be driven by enterprising top management and dynamic leadership as the head of institution.
- Focusing on the students' satisfaction to achieve world class competition by providing efficient coordination, communication, cooperation and commitment.
- Six sigma uses variety of work techniques like TQM, statistical process control, and business process engineering. The academic / administration members should be clearly explained about the cause and effect relationship in this process. High caliber commitment is required for improved performance and providing for structured and standard problem solving tools and methods for obtaining expected results. In short, new ways of thinking, communication and operating should be prevalent in the entire organization
- An educational institution is data driven such as students' data, faculty data, resources data and knowledge data.

Institution must be process based so that it can build competitive advantage in delivering value to students. Six Sigma helps in positioning the process

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for designing the curriculum, measuring performance, improving efficiency and customer satisfaction or even running the institution. To effect creative changes, 6 ó provides tools that are dynamic, responsive and proactive. Launching new ideas and methods are risky but Six Sigma helps to manage setbacks. Faculty members are constant learners, training them and involving them in the process of Six Sigma is not very difficult. The training may be imparted in phased manner over a period of three months so that the human resources engaged in implementation can understand, implement and improvise. This system implementation allows collecting and recording data accurately and consistently. Implementation of 6 ó provides invaluable experience for career development for the teaching and non teaching staff. Working on 6 ó improves the ability of the person and makes a difference in the delivery of services. It enlightens the people involved in the process to focus on problems and then addressing the problems. The management can apply VOC (Voice of Customer i.e., student and other stakeholders) method to collect view points on various processes and problems through structured questionnaire, assess and prioritize the same for rectification.

#### **Challenges while implementation:**

The biggest challenge that can be envisaged is "strong resistance", presuming more work, shifting priorities, demanding time to organize meeting, failure to work in a team and reluctance to constant change. Six Sigma disrupts and confuses in its initial stages of implementation thus hampering its implementation and killing the initiative of the organization. It is very important to highlight benefits to the leaders, setting clear goals patiently resolving conflicts, emphasizing the benefits and encouraging open dynamic participation from everyone. The management must be prepared to take risk, exercise judgment, make tough calls, coordinate the activities, tracking progress, avoiding / minimizing the impact on ongoing operation, setting meaningful and manageable goals and exert influence. It requires "total involvement" of every member of the educational institution to contribute to the overall success.

#### **Power of Six Sigma in educational institutions:**

The objective is to provide utmost satisfaction to the student in their learning process. This can be applied to avoid wastage of intellectual, physical and financial resources, by providing better process by the happier and productive academic and administrative staff. The Six Sigma in educational institution ensures:

- Higher satisfaction to the student in terms of acquiring knowledge, opportunity to innovate, explore, experiment and experience the joy of their creations.
- Improved admission and transaction facilities like obtaining diplomas, scholarships, bonafides, notification of selection of course, travel concessions forms by reducing the processing time.
- Efficient emergency mechanism in the laboratories and the campus.
- Better planning of available financial resources
- Optimizing material and consumable management in labs.
- Recruiting and retaining quality faculty and trained office staff who can deliver professional service.

Finally, the Six Sigma methodologies can change the face of modern educational institution and their academic /administrative delivery system.

#### **Conclusion:**

The Six sigma is well tested tool of quality management in renowned industries in India and abroad. Its success lies in providing an environment encouraging problem solving, excellence and continuous improvement. It requires restructuring of the organization based on a culture of positive thinking. Sufficient resources, enough time and reviewing the progress are the key to the success. Training all the participants and offering rewards and incentives helps

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to achieve benchmarked targets. Finally its success lies in developing free flow of communication. Its implementation is a tough task but if applied with caution will turnaround the "ailing" higher education system in India.

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