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RESEARCH ARTICLE

DOES THE SIX SIGMA – DMAIC APPROACH MODIFY THE EDUCATIONAL QUALITY?

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ABSTRACT

Six sigma is the most familiar term in the industrial units that has been aimed for quality considerations. This thematic paper has been aimed at examining the relevancy of the six sigma method in academia and its beneficial aspects while implementing in the academic process of the teacher education. Now, Educationist have realized to adopt the six sigma based strategies for enhancing the overall institutional quality.

Key words:

Six sigma – DMAIC,
Educational quality, Research.

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INTRODUCTION

The Necessity of Quality Assessment

The quality does not just happen. It must be planned for. Quality needs to be a major plank in an institution's strategy and needs to be approached systematically using a rigorous strategic planning process. Some of the crucial issues that necessitate the quality are:

- The quality is sacrificed by the quantity in an undesirable way due to proliferation of teacher education institutions. Generally private institutions, particularly the teacher education institutions in India are viewed with skepticism and contempt.
- Rapid expansion of teacher educational institutions in India has resulted in deterioration in quality of manpower coming out from these institutions on account of poor infrastructural facilities, admission policy and above all the examination system adopted by these institutions.

The Lacuna in Existing Assessment System

The existing quality assessment system of classroom learning does not encompass the psycho – somatic aspects that have direct effect on the academic learning process. For an instance, The NBA (National board of accreditation) under AICTE (All India council of technical education) has been constituted to do accreditation process. But NBA concentrates more on the system development and overlooks the aspect of customer satisfaction as a means of evaluating the quality level (Ahuja, 2004).

Similarly, the National Accreditation and Assessment Council (NAAC) India in collaboration with the Commonwealth of Learning (COL), Canada, has initiated the process of developing the quality Indicators for Teacher Education in the year 2007 and the policy document stressed "In order to attend to the growing concern of teacher quality and teacher shortage, it is crucial to examine the core of the problem that is, the type of teacher preparation and training being provided". This is apparent that the present system of teacher education should be inclusive of the quality assessment method like six sigma.

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Definition

O'Neill & Duvall (2005) described that Six Sigma (6 σ) is a disciplined quality improvement methodology that focuses on moving every process that touches the customers - every product and service - towards near perfect quality.

Brue (2003) claim that six sigma developed towards a technology-based statistical process approach rather than a broad business improvement approach. SixSigma is an organized, parallel-meso structure to reduce variation in organizational processes by using improvement specialists, a structured method, and performance metrics with the aim of achieving strategic objectives.

Academic six sigma

Based on these theoretical assumptions of the six sigma experts, the investigator has defined the academic six sigma as a comprehensive and flexible system of achieving, sustaining and maximizing the process outcome through adopting the societal needs, efficient use of facts, statistical quality control principles and attaining the objectives through effortful consideration to manage, improve and reinventing the educational process (Hari Haran & Mohanasundaram, 2013).

DMAIC

Six Sigma provides a structured approach to improving quality called the Six Sigma Improvement Model or DMAIC referring to the five steps of the process: Define Measure, Analyze, Improve and Control.

Define phase

A problem definition step that defines the objectives of the quality improvement of the academic process as well as who the customers are. In this phase the needs and expectation are noted for an efficient learning process.

Measure phase

The quality characteristics that reflect learning improvements are selected and a measurement system is established to collect data on these characteristics.

Analyze phase

The data collected in the previous step is examined to provide information that will be used to redesign or modify the process to improve it. Quality management tools such as cause-and-effect diagrams, flow charts, scatter diagrams, and statistical process control charts are used to assist in the analysis.

Improve phase

The design changes or process modifications that result in improvements are implemented. Academic Systems are established to collect data from the process reflecting the status of improvements.

Control phase

The process is monitored to ensure that the process improvements are maintained.

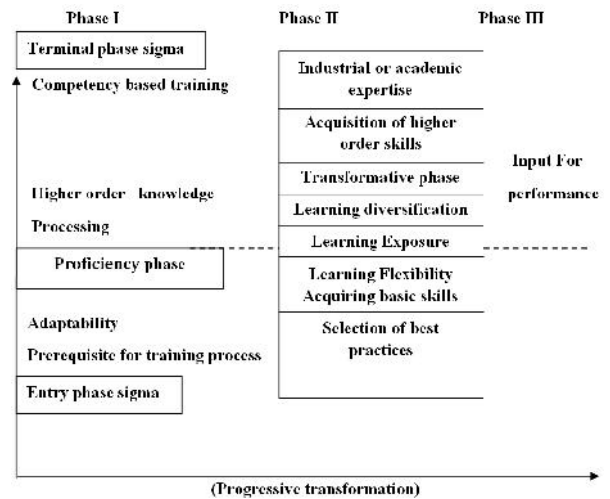


Figure 1 The need of six sigma based learning competency of prospective teachers

For education as for industry, quality improvement is no longer an option, it is a necessity and quality constraints can be assessed by quality methods like the six sigma which is a quality proven principle that can enhance the quality outcome of the educative process particularly in the teacher education program where the six sigma research has not been profusely undertaken as in the industry.

Concept of Six Sigma: Sigma (σ) is a letter in the Greek alphabet that has become the statistical symbol and metric of process variation. The sigma scale of measure is perfectly correlated to such characteristics as defects-per-unit, parts-per-million defectives, and the probability of a failure.

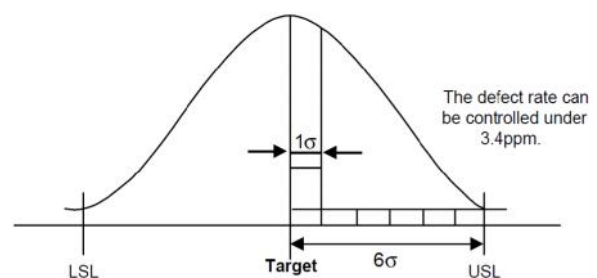


Figure 2 The normal probability curve showing the six sigma specification limit

Understanding Six Sigma first requires providing a conceptual definition and identifying an underlying theory of normal probability curve which is shown in figure 2. This quality analysis has long term effect and the table 2.1 shows the sigma value and its corresponding DPMO (Defects per Million opportunities) values formulated by Gitlow as in the Table 1.

Table1 -Gitlow table value for Process sigma and for DMPO

| Sigma quality level | Long-term process (assume with 1.5 shift mean) | |
|---------------------|--|--------------|
| | Non-defect rate (%) | Process DPMO |
| | 30.853 | 691,462.5 |
| 2 | 69.146 | 308,537.5 |
| 3 | 93.319 | 66,807.2 |
| 4 | 99.379 | 6,209.7 |
| 5 | 99.976 | 232.7 |
| 6 | 99.99966 | 3.4 |

The Dmaic Approach in Teacher Education

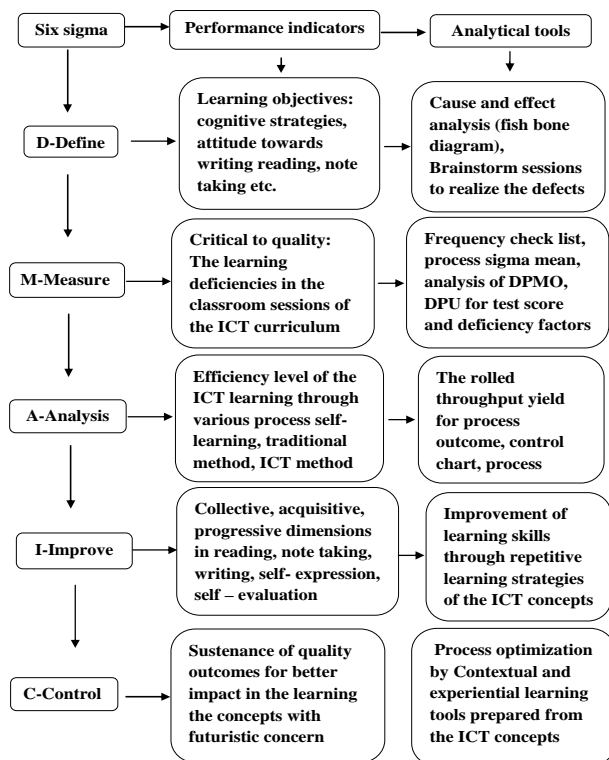


Figure 3 Six sigma-DMAIC based analysis of learning

Looking to the 2030 horizon, a highly competitive and sustainable social market economy will be needed in order to maintain social cohesion according to the European council. The teacher education and training are the key factors to achieve this aim (HariHaran, Zascerinska & Swamydhas, 2013).

CONCLUSION

In this global context, Teacher quality, teacher learning, and teacher improvement are viewed as the prime foci. Since the six sigma application is intended for quality deployment, the academic institutions can implement this method to foster the earnest educational practices on which the entire national progress sustains.

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The prevailing analytical study shows that the incorporation of six sigma practice will yield the fruitful results in all forms of academic practices.

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