

## A Concise Review on Lean Management in Higher Education

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### ABSTRACT

*The motive of this review paper is to correlate the accumulated body of research on Lean in higher education, draw interpretations to help guide successful Lean implementations and bring forward future research directions to set up a rich base of knowledge that enlighten both practice and research.[10] Methodology used is Review of Literature for Lean in higher education. Conceptual framework for Lean Management has been developed. Findings showed that Lean has quantifiable value when used to enhance administrative and academic operations in higher education. Dedication is required on the part of University's top management to prosper the culture of Lean and adjust to the rapidly changing environment of higher education. There was an enhanced workflow, decrease in waste and undesired motion. Conclusion was that the Lean implementation will be impactful and effective if it will involve long term strategic planning, dedicated executive management, organizational learning covering all the levels and cultural changes in the workplace. There was a notable reduction in waste, waiting time, and optimal and ideal utilization of human resources was observed.*

**Keywords:-** Lean Management, Continuous improvement, Leadership, Quality, Efficiency, Lean, Lean higher education, higher education, Higher education institutes (HEIs), lean manufacturing, Lean thinking, service sector, education, implementation, work flow, process improvement.

### I INTRODUCTION

Lean is a collection and deposition of propositions and enactments evolved over various decades by the Toyota Motor Company to set up operational excellence as a strategic cornerstone.[10] Lean Management is a term which was emerged by Krafcik (1988) and was afterwards entitled "lean" in 1990s (Womack *et al.*, 1990).[14] The "Toyota Way" (Liker, 2004), highlighted continuous improvement and admiration for employees as a key to judicious business ideologies to strengthen product standard.[10] Toyota broadened Lean thinking to all the facets of its business, including product evolution, supply chain logistics, finance and customer assistance. Over the past decades, Lean propositions and enactments have been consolidated worldwide in public and private sector organizations. Lean Higher Education (LHE) (Balzer, 2010) has empowered post-secondary institutions to look for similar enhancements in reaction to the stipulation of the higher education marketplace: magnificent the presumptions of students, faculty and other components; minimizing expenses in an age of arising costs and diminishing financial resources; fulfilling demands for publicans' verability in terms of capability and efficacy; and, most primarily, strategically strengthening all available institutional assets to perform the educational, scholarship and excel missions of higher education.[10]

While it is recognized that the implementation of Lean Management principles can lead to considerable improvements and advantages, including decreased costs, improved effectiveness, preferable product flows, waste denunciation and improved consumer and employee's gratification, it is also acknowledged that many endeavors were malfunctioned to

accomplish the possible advantages, with many of the initiatives falling away.[14]

Lean emphasizes on maintaining, sustaining and balancing processes so that criticizing issues can be recognized and the workforce constructed re-proving thinking skills to settle those issues and enhancing workflow. In the last two decades, lean practices have been implemented beneficially in manufacturing (Alsmadi *et al.* 2012). Application of Lean Management in the manufacturing sector has been very victorious and effective. Service industries have recently obtained much significance. Such service industries progressively follow lean methodologies and tools to enhance their achievement in providing outstanding services. Lean thinking needs an understanding of the concept of constantly recognizing methods to decrease waste through the application and execution of lean customer gratification instruments and methodologies.[13]

Higher Education Institutions (HEI) plays a major role in society and economy. There has been a considerable shift in the Higher Education (HE) environment that have brought both challenges and advantages (Lu *et al.*, 2017) such as a reduction of budgets combined with increasing and varying numbers of student enrolments (Welch, 2017). Within the Higher Education Sectors, there is an increased struggling amongst Higher education institutes for financing of both operations and research budgets (Quinn *et al.*, 2009, Mitchell *et al.*, 2015).

Further, there is a necessity for Higher Education Institutes (HEIs) to do more with less and do superlative utilization of resources—advancement of new teaching and learning strategies so as to increase

the value proposition to students and acuminated their customer focus.

The Utilization of lean management concept is pendant and excellent in many organizations allover the world. It is also used to constantly upgrade

subsisting production procedures and to turn down the problems of administrative procedures. Woefully, in higher education institutes, the understanding regarding Lean management as a highly productive method is low.[15]



**Fig 1. Lean house in higher education**  
(Source: Altered from Hofer, 2016, p.197)[15]

(a) **The Lean Principles-** Womack James and Jones Daniel (1997), p. 15, suggested five basic principles of Lean:

- (i) Customer and value inclination,
- (ii) Throughout value stream thinking,

- (iii) Solicitation of Flow principle,
- (iv) Prosecution of the Pull proposition,
- (v) Continuous chasing of excellence.[15]

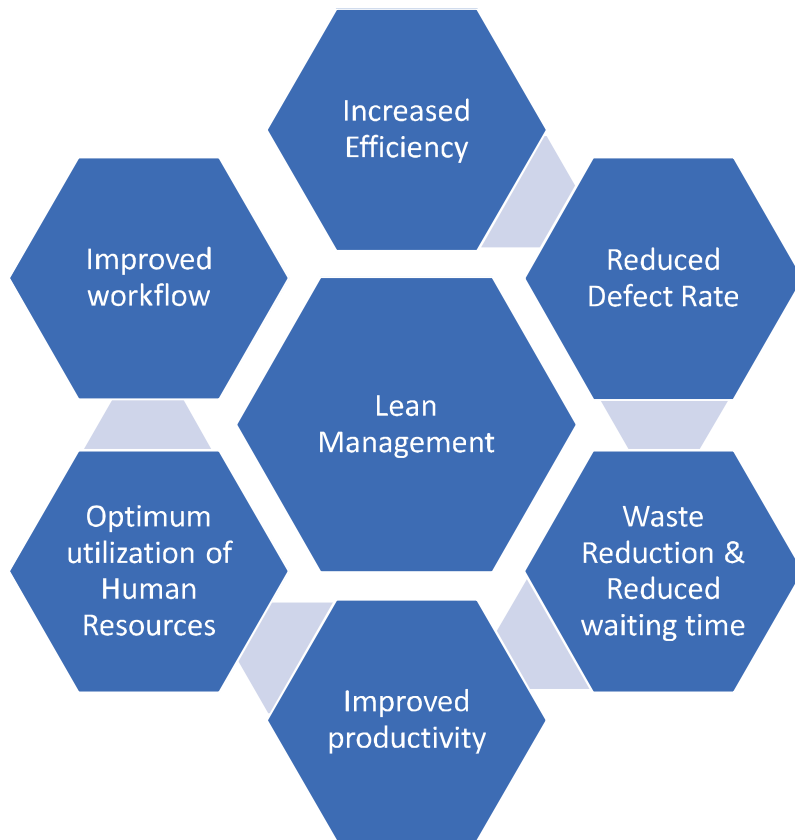
(b) **Lean Management Tools**



(Source: [www.manutan.com](http://www.manutan.com))[9]

(c) **Conceptual Framework-** A Conceptual framework was developed for Lean Management which includes: Increased efficiency, reduced

defect rate, waste reduction, reduced waiting time, improved productivity, optimum utilization of human resources, improved workflow.



## II OBJECTIVES AND METHODOLOGY

### (a) Objectives

- (i) To present a Literature review that examines the application of Lean Management in higher education.
- (ii) To arrange the gathered body of Research on Lean in Higher Education.

- (b) **Research Methodology-** This literature review explore and investigate the academic literature regarding the utilization of Lean in higher education.[10] Based on the literature review, five key lean principles are presented. The results were limited to peer reviewed journals, books, eBooks with Years ranging 2011-2021. The article title, subject and key words were reviewed and where required the abstract was appraised for relevance leaving a total of 40 literature review for consideration. Review of relevant literature is done.

## III REVIEW OF LITERATURE

- (a) Balzer William K., Francis David E., Krehbiel Timothy C. and Shea Nicholas (2016) did study in the title of "A review and perspective on Lean in higher education". [21] The objectives of this research were to draw conclusion to help guide successful implementation of Lean, to synthesize body of research on Lean in higher education.

Survey review was used to collect the data. Literature review method or approach was used. In research methodology, EBSCO definitions were used to select all articles published. Findings showed that Lean has quantifiable value when used to enhance administrative and academic operations in higher education. It was concluded that Lean implementation will be impactful and effective if it will involve long term strategic planning, dedicated executive management, organizational learning covering all the levels and cultural changes in the workplace. Future research or research gap is to further develop evidence-based support for Lean higher education, widen prospects of Lean higher education research, expand measures of Lean impact on higher education.[1]

- (b) Kumar R Anand, Dinesh S N, A Pranav, M Nithish (2020) did study in the title of "Application of Lean Thinking for Effective Utilization of Resources in Education Sector".[13] The objectives of this research were to apply Lean thinking for identifying and minimizing several wastes in educational institute, to implement Lean thinking and adopt continuous improvement. Chi square test was used as the method of Hypothesis testing. Gap analysis was used for data analysis. Cause and effect diagram was used for observation. Findings revealed that there was an improved workflow, decrease in waste and unwanted motion. Survey shows that successful

- implementation of Lean practices in the service sector leads to improved customer satisfaction and financial returns. It was concluded that there was a noteworthy reduction in waste, waiting time, and ideal utilization of human resources was observed. Due to lack of engagement, it was difficult to promote a culture of continuous change.[2]
- (c) Hofer Stephan, Naeve Jorg (2017) did study in the title of “The Application of Lean Management in Higher Education”. The objectives of this research were to show how Lean management can be applied in university environment, to check how a higher education institute can move forward to become a Lean university, to know the difficulty level of implementing Lean in university environment. Case study method and Literature review were used to collect data. Multiple case analysis was used to analyze the data. Findings showed that commitment is required on the part of University’s top management to develop the culture of Lean and adapt to the rapidly changing environment of higher education. It was concluded that implementation of Lean management requires high persistency and staying power. Future Research/Research gap is to examine how application of Lean differs between private and non-private organizations in Higher education and to inquire how Lean can improve the learning process and creativity.[3]
- (d) Cano Michele, Moyes David, Kobi Abdessamad (2016) did study in the title of “A framework for implementation of lean management tools in the higher education institutes”. [14]The objective of this research was to present framework for the implementation of the operational and technical aspects of lean manufacturing in the higher education sector. Data was collected through Grounded theory approach by interview method. The interviews were selected on the basis of theoretical sampling. Data was analyzed through comparative analysis. It was found that identification of waste is a crucial tool in improving processes by eliminating value. Findings showed that projects need to be properly aligned with clear measurable objectives. Findings further identify key aspects of implementation to be, project selection and integration, tool selection and integration, adoption of lean principles, the importance of a good measurement system. It was concluded that Framework of Lean operations management is a new and holistic approach in the implementation of Lean manufacturing within the Higher education sector.[4]
- (e) Khairi M. Azim, Rahman Mohamed Abd (2018) did study in the title of “Implementing lean in Malaysian universities: Lean awareness level in an engineering faculty of a local university”. [10] The objectives of this research were to discover the extent of lean awareness among university’s community and to identify the staff perception on lean benefits and the challenges in implementing it. Data was collected through Web based survey using questionnaires from educational and management staff. Statistical Package for the Social Science (SPSS) was used to analyze the data. It was found that the Lean awareness level among the university community was low. It was crucial to prepare an institution for Lean transformation by stressing importance of Lean concept. It was concluded that the most crucial Lean benefit is the reduction of waste and improved productivity. Lack of knowledge about Lean concept, lack of management commitment and budget were the major limitations and barriers in the successful implementation of Lean.[5]
- (f) Parv Luminita (2017) did study in the title of “Continuous improvement processes using Lean management tools: A case study”. [18]The objectives of this research were to know how Lean management can be applied in the university setting to improve the management process, to evaluate the implementation of Plan, Do, Study, Act cycle in the University. Questionnaire based survey tool was used to collect the data. Improvements were mapped through Standard Lean tools. The improvements were centered on the PDSA Improvement cycle and aligned with the students’ needs. It was concluded that standardizes the good practices towards continuous improvement. Positive results were obtained through strong academia-industry relationship, project-based learning, internships, capstone project and by providing students and faculty with real life projects.[6]
- (g) Nawanir Gusman, Binalialhaji Mohammed, Lim Kong Teong, and Mohd Ahmad Hanafiah (2019) did study in the title of “Becoming Lean: The Way towards Sustainability of Higher Educations Institutions”. [19] The objective of this research was to examine the implications of Lean implementation on sustainability performance of Higher Education institutes. Data was collected using a close ended questionnaire survey. Data was analyzed through Structural equation modeling approach with Smart PLS software. Findings showed that in order to be maintainable, university should employ more efforts in the implementation of Lean higher education practices. It was concluded that Lean Higher Education practices contributes in a positive manner to sustainability performance in terms of institutional, social, economic and environmental. This study contributes by providing the causes of high operating costs and creating methods to eliminate the waste and reducing the operating costs. The limitation was related to the context of the study, which focused only on a single technical university in Malaysia. Future study should focus on multiple institutions.[7]

- (h) Glushchenko Valery V., Presnuhina Irina A., Samodelova Ekaterina V. (2021) did study in the title of “Improvement of Service Quality in Higher Professional Education Institutes by Application of Lean Management techniques in Universities”. The objective of this research was to enhance the service quality of higher education institutes in universities. Scientific Research method was used. Data was collected through interviews and expert assessments. Data was analyzed through comparative and predictive analysis. Findings showed that creation of Lean manufacturing mechanism in universities acts as an effective tool for increasing service quality of domestic higher education without any extra costs. It was concluded that implementation and functioning of Lean mechanism in universities can have positive effect on social economic development of a university and can increase graduates’ competence.[8] [22]

#### IV FINDINGS

Findings showed that Lean management has quantifiable value when used to enhance administrative and academic operations in higher education.

Commitment is required on the part of University’s top management to develop the culture of Lean and adapt to the rapidly changing environment of higher education. There was an improved workflow, decrease in waste and unwanted motion. Survey shows that successful implementation of Lean practices in the service sector leads to improved customer satisfaction and financial returns. Projects need to be properly aligned with clear measurable objectives.

Findings identified key aspects of implementation like project alternative and consolidation, tool pick and incorporation, acquisition of lean principles, the significance of a good calculation system. Lean awareness level among the university community was low. It was crucial to prepare an institution for Lean transformation by stressing importance of Lean concept.

In order to be sustainable, university should exert more efforts in the implementation of Lean higher education practices. Creation of Lean manufacturing mechanism in universities acts as an effective tool for increasing service quality of domestic higher education without any extra costs.

#### V CONCLUSION

It was concluded that Lean implementation will be impactful and effective if it will involve long term strategic planning, dedicated executive management, organizational learning covering all the levels and cultural changes in the workplace. Optimum utilization of human resources, significant reduction in waste, reduced waiting time was observed. Implementation of Lean management requires high persistency and staying power. Framework of Lean operations management is a new and holistic approach in the implementation of Lean manufacturing within the Higher education sector. The most crucial Lean benefit is the reduction of waste and improved productivity. Lean Higher Education practices contributes in a positive manner to sustainability performance in terms of institutional, social, economic and environmental. Implementation and functioning of Lean mechanism in universities can have positive effect on social economic development of a university and can increase graduates’ competence.

#### VI LIMITATIONS

- (a) Due to lack of engagement, it was difficult to promote a culture of continuous change.
- (b) Lack of knowledge about Lean concept, lack of management commitment and budget were the major limitations and barriers in the successful implementation of Lean.
- (c) Lack of highly qualified professionals, Lack of interest in training, Lack of employees’ commitment are the barriers in Lean implementation in Higher education institutes.

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