


## Chapter 5

# Continuous Improvement Philosophy in Higher Education: Lessons From the DNA of the Toyota Production System to Improve Course/Program Delivery Process

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### **ABSTRACT**

*This chapter explores the unspoken roles of Toyota production system in the context of program/course delivery process. These rules are; how people work, how people connect, how the workflow is organized, how to improve and who does the improvements. These four unspoken rules of Toyota production system are strict guidelines from the shop floor to the top-level management. Toyota production system emphasizes learner's philosophy to improve the value-added activities by understanding the root cause of a given problem. Under these four rules, further, this chapter will look into the different tools that could be applied for the continuous improvement in course/program delivery process. This paper will define the lean principles and waste in the context of the delivery process.*

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## **INTRODUCTION**

TPS refers to Toyota production system, which took Toyota 30 years of development from 1945 to 1970 to come up with a system that can tightly integrate the various elements of a manufacturing process by focusing on waste elimination. The concept of TPS is often misunderstood and described as a toolkit or set of problem-solving tools (Liker and Convis, 2012), which is not correct. TPS promotes systems thinking, by integrating machines, material, people, information, method, and environment to create end-to-end value instead of fixing problems in different areas.

TPS principles are successfully adopted primarily by the manufacturing sector, at the same time service sector, such as hospitals, retail, airports, hotels, etc. used these principles successfully to improve the service delivery process. It is essential to understand that the academic environment is very different from the manufacturing sector and other service sectors in many ways. Some of the key differences are;

1. Lecture delivery involves both processing students and information simultaneously.
2. There is a very high level of autonomy when it comes to lecture delivery processes. Variability can be observed in the process even a professor teaching the same course to two different sections. The variation can be in the form of content and presentation of content in the form of information. Also, lecture delivery method may changes based on class dynamics i.e. there is very low levels of standardization.
3. Most importantly, social and behavioral aspects to be considered as students are not parts or components. Student concentration levels may vary between courses taught on Monday morning and mid-day or days in the week.

Keeping above in mind, this chapter is not about lean tools and techniques that can be applied to solve various problems in the higher education sector. The focus of this chapter is to understand the DNA of the Toyota production system (TPS) in the context of higher education institutes (HEI) and investigate the applicability of four rules of TPS to develop an improvement culture. Following the philosophy behind the TPS, the idea is to develop a team of problem solvers who work systematically to achieve the organization's purpose, mission and vision.

It is also important to note that when it comes to improving various processes at HEI, it is no different from other sectors. In the context of this chapter, the improvements to HEI must be aligned in the course/program delivery process to satisfy current and future customer needs. This is due to several factors (Alexander, 2000, and Cullen et al., 2003);

1. External pressures; the declining number of traditional student bodies such as students coming from diploma programs or high school. Table 1 shows student enrolment data for "Short-cycle tertiary education<sup>1</sup>" from 1992 to 2016. For short-cycle tertiary education stream student enrollment is decreased by 13.63%. Similarly, for upper secondary education in Canadian universities student enrollment is decreased by 12.21% from 2005 to 2016. In both cases, student enrollment trend is negative. This has a direct negative impact on the revenue from the student stream and government funding. However, for the rest of the programs (e.g. bachelors, masters, doctoral and post-secondary nontertiary education) universities maintained an overall consistent student enrollment (Student enrollment in 1992 and 2016 was 68.89% and 64.44% respectively).

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