Lean in Clinical Education: A Pilot Exploratory Project on Waste Analysis in Pre-Registration Pharmacist Training
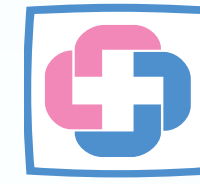
Cedric Poh, Department of Pharmacy

KK Women's and Children's Hospital
SingHealth

Introduction

Completion of Pre-Registration Pharmacist training requires multiple steps in the form of learning activities as well as assessments. It is, therefore, imperative to reduce inefficiencies in the production of clinical education.

Principles of Lean has driven revolutionary changes in manufacturing for continuous improvement. In Lean, waste is defined as anything other than the minimum amount of equipment, materials, parts, space or time which are essential to add value to the product.

Given the success in manufacturing, services (including healthcare provision [1]), higher education started to explore adopting Lean methodology and waste analysis to improve work processes [2]. However, such literature remains scarce in clinical education.

The objective of this pilot study is to incorporate Lean's waste analysis to re-look at KK Women's and Children's Hospital's Pre-Registration Pharmacist Program training structure, identify non-value adding activities and eliminate them.

Methodology

Study Design

This study was performed in Pre-Registration Pharmacist Batch 2018 who underwent training in Children Inpatient Pharmacy (n=9).

The training process was re-visited with several principles of Lean in mind in the order stated in Figure 1.
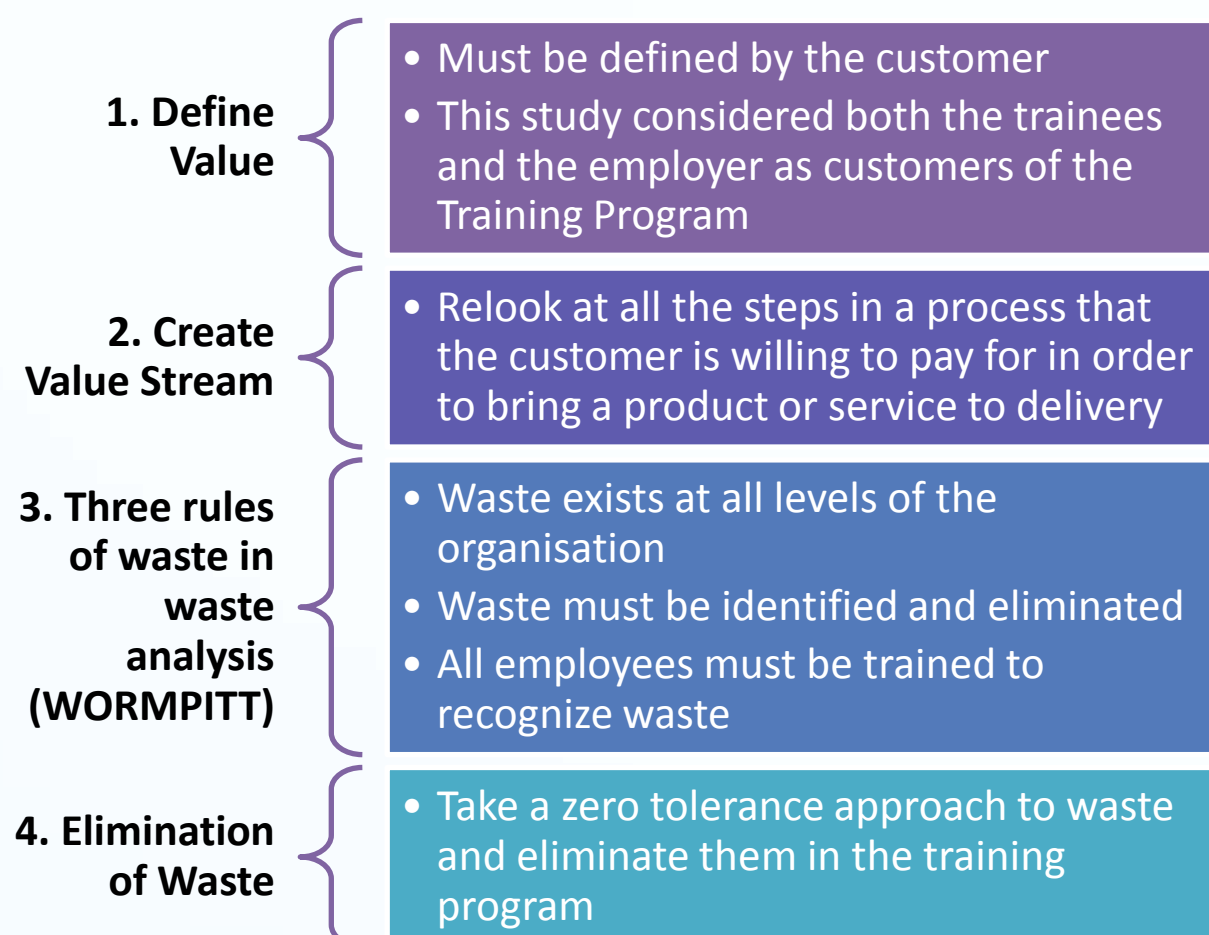
1. Define Value
- Must be defined by the customer
- This study considered both the trainees and the employer as customers of the Training Program

2. Create Value Stream
- Relook at all the steps in a process that the customer is willing to pay for in order to bring a product or service to delivery

3. Three rules of waste in waste analysis (WORMPITT)
- Waste exists at all levels of the organisation
- Waste must be identified and eliminated
- All employees must be trained to recognize waste

4. Elimination of Waste
- Take a zero tolerance approach to waste and eliminate them in the training program

Figure 1. Four step approach in this study using principles of Lean

Results

Using the "WORMPITT" acronym known in Lean's waste analysis, we have identified several wastes and removed them – i.e. Waiting, Overproduction, Rework, Motion, Processing, Inventory, Intellect and Transportation. Of which, three of them were found in our training process.

Overproduction

Description: Making more products than what customers demand for
Before: Trainees had week-by-week guided ward check with different Pharmacists. Without a proper handover, same concepts were potentially repeatedly taught by different Pharmacists.
After: We implemented weekly handover forms for various Pharmacists to update what was already taught and reduce replication.

Motion

Description: Wasted time and effort related to unnecessary movements
Before: Trainees had to obtain individual checklists in the local drive separately and were usually uncertain with regards to how many copies to print and complete.
After: We created a continuous document of checklists required (with duplicate pages in the set if more than one copy is required) to reduce acquisition of checklist to a single click.

Intellect

Description: Under-utilisation of people's skills and knowledge
Before: Pharmacists were conducting the training of compatibility chart even though on day-to-day basis, the Pharmacy Technicians / Executives (PT/PE) are the ones doing more than 80% of the charts.
After: We have since appointed the more suitable PT/PE to conduct the teaching hence increasing the percentage of PT/PE involved in training by 25%.

Conclusion

Based on this pilot study, Lean has the potential to cut down excessive training activities in clinical education. Moving forward, the project encourages quality improvement ideas for clinical education to consider employing Lean, and potentially Six Sigma methodology.

References

[1]Chand DV. Observational study using the tools of lean six sigma to improve the efficiency of the resident rounding process. *J Grad Med Educ.* 2011 Jun;3(2):144-50
[2]Vijaya Sunder, M. (2016), "Lean Six Sigma in higher education institutions", *International Journal of Quality and Service Sciences.* 2016 Jun;8(2):159-78.