Implementing and Teaching Lean in Real Projects in MBA Programme

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Abstract

Main Thesis: The continuous improvement put into practice in real projects as method of teaching and learning of the Lean Enterprise Methodology in the MBA program at UPAEP.

A new approach into a well-known theme nowadays; we shall explore the implementation of the Lean Enterprise Methodology in subjects given on final semesters, where the student works on a real project. This Methodology, rises with a necessity of diagnosing a company where the student is working chooses a process that could be improved.

We will demonstrate the benefits for the:
- STUDENT: integrating all the knowledge gathered throughout the graduate programme towards the application in a real life project;
- PROCESS: improvement flow, resource optimization, elimination and/or minimization of waste, lead time reduction and increment added value;
- COMPANY: improving the efficiency and effectiveness indexes in the processes, and the adoption of a new change in culture having “Lean Thinking” in the employees mind;
- FACULTY of the Business Administration area, an increase of graduate program completion

Keywords: Lean Enterprise Transformation, Continuous Improvement, Added Value, Competitiveness, Productivity, Graduate Education, Innovation.

Introduction

The continuous changes in the globalized market drive us to make substantial modifications on the educational scene. The requirements of the work force are in constant change and very diverse, so the universities must be able to be flexible, both in their academic programs, as well as in the process of the teaching-learning process in order to be able to meet such requirements.

Mentioning education in Mexico takes us often to ideas of low efficiency, low effectiveness, high dropout ratios, among others; although, the question is ‘what are the universities doing for the education in Mexico? How can we contribute to the economic development of a country?. Organizations such as
UNESCO mark that higher education is a factor in determining the fulfillment of development goals of a country.¹

A real starting point would be to determine the problems to solve within a system that has many irregularities, therefore both public and private universities have targeted the development, improvement and boost programmes that respond better to the existing workforce necessities.

1. Education in México: Graduate Programmes

Today Mexico lives a very complex reality in which positive signals of an economic, political and cultural improvement are being seen, and yet these coincide with events of injustice, frustration and violence that affect all citizens in particular the educational sector. These changes not only economic but social-cultural factors affect primarily the younger population of the country.

Mexico has a population that surpasses the 112 million mark according to the National Institute for Statistics and Geography (INEGI 2014), with more than 57 million women, having less males in the population.

The population pyramid has inverted in the last years reducing the number of the population below 14 years of age and incrementing the adult population, so the mead age of the Mexican population is now 26 years of age. Even with this mentioned reduction in the coverage rate between young people between 15-17 years of age is a mere 65.9%, and even lower for people between 18-23 years of whom only 28.6% enter the higher education sector.

We shall now see data relating to the performance of graduate programmes and graduate students in our country.

<table>
<thead>
<tr>
<th>Scholar Period</th>
<th>Middle Education (15 a 17 años) Total</th>
<th>Male</th>
<th>Female</th>
<th>Higher Education (18 a 23 años) Including Postgraduates Programs Total</th>
<th>Male</th>
<th>Female</th>
<th>Higher Education (18 a 22 años) Without Postgraduates Programs Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990-1991</td>
<td>34.1</td>
<td>34.7</td>
<td>33.6</td>
<td>11.4</td>
<td>12.9</td>
<td>9.9</td>
<td>13</td>
<td>14.6</td>
<td>11.3</td>
</tr>
<tr>
<td>2000-2001</td>
<td>47.2</td>
<td>47</td>
<td>47.4</td>
<td>17.2</td>
<td>17.9</td>
<td>16.8</td>
<td>19.2</td>
<td>19.8</td>
<td>18.7</td>
</tr>
<tr>
<td>2010-2011</td>
<td>62.7</td>
<td>61.8</td>
<td>63.7</td>
<td>23.9</td>
<td>24.5</td>
<td>23.4</td>
<td>26.4</td>
<td>27.1</td>
<td>25.8</td>
</tr>
<tr>
<td>2012-2013</td>
<td>85.9</td>
<td>84.9</td>
<td>86.8</td>
<td>25.8</td>
<td>26.5</td>
<td>25.2</td>
<td>28.8</td>
<td>29.4</td>
<td>27.8</td>
</tr>
</tbody>
</table>

¹ The coverage or gross rate of schooling corresponds to the total number of students enrolled in an educational level at the start of the school cycle, for each hundreds of the group population with the correspondent age to course that level. The data is only for the population that is enrolled at a site school system.

Throughout the years, UPAEP has increased its commitment to the welfare and development of our country, providing integral education to the people in Mexico. Forty years after it was founded, UPAEP goes forth to meet the challenges of the future, searching alternatives for the less fortunate. Being thereof a national referral, as the second private university of highest growth, having a 7.17% of the national postgraduate population in Mexico and being the biggest private university in the state of Puebla with a total of 13,750 students enrolled in undergraduate programmes.

UPAEP with the idea of generating added value to all the members of its community has been able to establish the best benefit-cost ratio of the region.
1.1 Graduate programmes at UPAEP University and its contribution to the local, regional and national indexes.

“It is within this context that UPAEP University, establishes an agreement with the ministry of education (SEP) of the state of Puebla which has three central purposes: 1) Take mutual actions with the purpose of elevating the teaching profession to a higher level, benefiting the development of the educational sector of the State of Puebla, 2) Help the curricular integration of the communication and information technologies (TIC) and knowledge and learning technologies (TAC) in the state educational system and 3) Eliminate the economical obstacle, through a scholarship programme for teachers.

The graduate programmes that were offered at the beginning including; graduate programmes in math education, education technology, administration, pedagogy and later, one in family development”\(^1\).

The age range of the population between 14 and more years of age is more than 88,947,553 people of whom those economically active in Mexico is only 52,084,225, according to data published by INEGI\(^2\), the students come from within this range, 55% of them from rural communities.

The data of the postgraduate population with a SEP agreement at UPAEP, as well as the percentages of completion efficiency are\(^2\):

<table>
<thead>
<tr>
<th></th>
<th>Undergraduate enrollment</th>
<th>Graduate enrollment</th>
<th>Universities offering postgraduate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>3,732,396</td>
<td>276,289</td>
<td>1159</td>
</tr>
<tr>
<td>Puebla</td>
<td>222,720</td>
<td>19,844</td>
<td>79</td>
</tr>
<tr>
<td>UPAEP</td>
<td>13,750</td>
<td>3,225</td>
<td></td>
</tr>
</tbody>
</table>

With the intention of rising the percentage of completion efficiency, as well as to be able to contribute to the economic development of the region where the students come from, it was decided that the final projects should generate an impact within the institutions of the students as well as within the state educational system. The guidelines are: a) development of teacher aids, b) training programmes for teachers, c) proposals for the enrichment of curricula, d) improvement of educational management and d) proposals for education intervention.

2. **UPAEP internationalization programme and the development of innovative graduate programmes.**

The educational offering that UPAEP has, being a moderately young institution, with only 41 years since its founding, offers 43 undergraduate programmes, 11 specialities, 34 graduate programmes and 12 doctoral degrees, of which 8,577 students are from undergraduate programmes, 3,356 study a graduate programme, 169 online, and 723 in the open university system. It has 1,175 faculty, 2,660 students have some sort of scholarship, and 1,402 are high school students².

The university is regulated within 5 main guidelines³:
1. Dare to live congruently with our identity. 2. Privilege through education a Christian humanistic formation in search of professional and scientific excellence. 3- Create academic systems of authentic social pertinence. 4. Involve oneself in the intercultural development and formation of the academic community through international strategic alliances. 5- Be able to reach fields of confidence, collaboration and service.

Within social pertinence, as described on the 3rd main guideline, one can oversee that the university has programmes that are focused in a particular manner to promote the common good, not only in its own

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students, but in the neighbouring region in which the university has influence upon a population sector of low income.

As part of this, the university designed a campaign called “Vuela UPAEP” (fly UPAEP), that represents an opportunity for young people of low income communities, who have the potential and will to study and make improvements in their communities. The main objective of this campaign is: a) boost integral projects in scholarships, health, innovation, technology and competitiveness, align with the universities’ mission. b) Promote applied research that can generate knowledge to stimulate the sustainable development of Mexico, and c) favour the access to higher education.4

In accordance with such vision, we introduced the Lean Methodology and philosophy in the graduate programme of Business Administration; it aligns strategically with the 3rd line presented before, as a form of a sand clock in which projects and lean thinking go through the base of the clock with the intention to be able to construct a culture of change.

What does this mean? That we go through the general rules made within the scheme of the education in Mexico, through to the education at UPAEP, within the graduate programmes that have a SEP agreement5, the one in Administration to be precise, where the Lean Academy teaching-learning process is permeated to the students, who work in real projects with this Methodology of betterment in the processes within their institutions and that later benefit their own community and locality.

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5 Secretaría de Educación Pública, del Gobierno de México
Within the 4th guideline, the university has begun the task of forging strategic agreements with universities around the world who are congruent with our philosophy, beliefs, and values and have a considerable academic level. Here is a map that highlights the countries in which we have agreements including dual degrees, student and faculty mobility, research internships and combined research projects promoting free scientific research, continuous improvement on academic curricula to achieve a better level and quality education.

The perspective is that having alliances with universities of known world recognition has allowed UPAEP to permeate the knowledge, experiences and values in a local way to our region. We have been able to promote wonderful world initiatives that have allowed, from our own back yard, to collaborate on a better Mexico. In particular the agreements with MIT and Harvard since 2007, have allowed us to study and
implement methodologies for the development of several regions in the country, such as the MIT Lean Enterprise course and the Microeconomics for Competitiveness (MOC) course offered by the ISC Harvard network.

In 2012, MIT’s LAI promoted through UPAEP the creation of LAI Mexico; as a group of organizations focused in working and development of this management philosophy, using academic resources both from LAI and UPAEP with the aim of boosting competitiveness and productivity in companies and the Government of the State of the Region.

3. Project

“Teaching and implementing the Lean Philosophy and Lean Methodology into UPAEPs’ Business Administration programme”.

An important premise into the application of this theory in real world practice has been taught for many years in academic programmes, both undergraduate and graduate worldwide. Some countries such as Germany or the United States are very experienced, and are ranked very high on this respect. The students acquire work experience way before they conclude university. Mexico, on the other hand does not generally have this kind of professional practice fully at graduate level in their curricula, being this an important area of opportunity. For this reason, a pilot programme was proposed with one of the enrolled groups in 2013, in one of the last subjects of the MBA, boosting the Lean Enterprise Methodology, since it was considered to be an effective and efficient way to promote, implement and develop projects for the betterment of institutions and organizations.

3.1 What are the objectives of the pilot test?

a) Create a link from theory to practice in a real project, giving the student a guided experience of implementation to improve project’s performance in the organizations or institutions where they work. We give them, in a sense, a vision on how and what to do in their daily work.

b) Push the students to be “champions” not only of a single project improvement but convince them that they can be agents of change who can impact their own area of influence, communities or regional.

c) Promote Lean Thinking on students, so that it can permeate as a life philosophy that could transform societies.

d) Promote competitiveness and productivity of their organizations or institutions as well as each student’s area of influence.

e) As a collateral effect, be able to rise the percentage of completion efficiency of the fore mentioned programme.

Starting in spring 2013

As an innovation of the learning-teaching process, the initiative to teach the subject Integrating seminar through the Lean Enterprise Methodology, under the premise of providing a series of improvements towards the benefit of the involved parties. It should be mentioned that a diagnostic of the problems concerning students completing the MBA found the following areas of opportunity:

1. Students had problems integrating their knowledge to complete a project.
2. The knowledge that students had acquired was not applied to a real work experience or it could not be monitored.
3. The completion projects did not offer a good academic level in most cases.
4. There was none or very little involvement of teachers with completion projects of students.
5. Students returning to their communities having finished their subjects would have little time or interest to return for advice or guidance for their completion projects, obtaining a degree from them.
6. The completion efficiency percentage was affected.
7. After 4 years, a student loses the right to gain a graduate degree. This is due to a redesign of the curricula, because a change of name and code [REVOE SEP6] of a programme; the student must then take a certain amount of credits at best if only 2 years have passed or loose the right to gain the degree if the 4 year mark has passed.

The benefits of this pilot test are as follows:
“For the STUDENT: in the sense that he can integrate all acquired knowledge in the graduate programme and apply them on a practical real project that will help the student as a means to get their degree, and be able as well to position the student as a betterment agent or “champion” for a company transformation as stated by MIT7; for the PROCESS: improving flow, resource optimization, minimizing and/or eliminating waste, reduction of Lead Time or time from start to finish of the process and elevating the percentage of added value for the process; for the COMPANY, organization or involved institution: improvement of the efficiency and effectiveness indexes in their processes and the adaptation of a new culture of change with “Lean Thinking” and the creation of a permeated value in their employees8; for the FACULTY of the Masters in Business Administration in the Graduate area of UPAEP rising the programme completion in the lowest possible time span. The TEACHER has provided the base knowledge so that the students be the promoters of Lean Thinking. It should be emphasized that the success of this must be shared and can be promoted in a much faster and effective way if it is built as a collaborative project. For SOCIETY obtaining better results and more equitable in matters of labour conditions, own resources as well as governmental ones, employment opportunities, among other things; the more competitive one gets, more employment opportunities are generated, more international investment opportunities, society itself can re-construct itself from within searching the common good. We could even say that tangible benefits can be seen on our ENVIRONMENT for this philosophy and Methodology of “Leaness” has permeated in the habits of people, creates conscience on the use of resources, reusing, recycling and reducing all for the benefit of our planet”. 9

4. Results
Until summer 2014, the course has been taken by 76 students who have developed a total of 19 projects in 12 institutions benefiting 10 regions in the state of Puebla. The projects have been well received both by executives and employees and have resulted in substantial processes benefits that reflect a medium to high impact at the company.

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6 Registro de Validez Oficial de la Secretaría de Educación Pública. For more information available in Spanish: [http://www.sirvoes.sep.gob.mx/sirvoes/jspQueEsRvoe.jsp](http://www.sirvoes.sep.gob.mx/sirvoes/jspQueEsRvoe.jsp)
5. Next Steps

After a year of teaching the Lean Enterprise Methodology in the MBA, one can perceive that in most of the cases, time was not enough in order to implement the student project in charge even when they have continue with the development on their own time with assessment by LAI-Mex staff, though this is a problem since students come from far away areas making this a problem in terms of time. It is because of this issue that since the summer of 2014, the programme has been modified so that it will span two quarters. This should permit a better follow up of the student projects in the involved organizations, institutions or companies. It should allow monitoring if the involved personnel is committed with the methodology and their habits are changing towards a more Lean Thinking scheme; numeric results will be checked within the betterment areas, such as cost reduction, minimization of waste and a raise in the value of the processes.

The experts at LAI-Mex have committed themselves to continue with the assessment for students that are willing to continue the processes of company transformation, continuous betterment as well as training in the Methodology and Lean Enterprise philosophy. We also would suggest the integration of Lean education in the redesign of the curricula on a horizontal scheme.

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6. Conclusions

With this work that has been undergoing more than a year, we cannot state that all areas of opportunity have been developed or improved, nor can we say that Lean is a magical solution for all problems. However, we can assert that it has been an inflexion point for the betterment of the learning-teaching processes of this terminal subjects, that Lean has been able to modify a lot of conduct patterns and bad habits of waste, and that both institutions and students involved in the programme have responded very favourably unto this way of Lean Thinking which we pretend to be an ongoing process to elevate productivity and competitiveness in educational institutions. We have analysed, improved and reflected upon many processes and work environments in pro of a better education that will optimize resources and promotes transparency in governmental administrations.

With this thirst of betterment, the reflection and analysis all with solid foundations in proven methodologies such as Lean Enterprise, we considered that it is a good start in order to obtain the established goals of this project. Although we must also be aware that the improvement of processes, is an ongoing and infinite journey that we have to drive.

References