



AN ADAPTIVE LEARNING CONTINUING EDUCATION AND CONSULTING PROGRAM FOR ORGANIZATIONS



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ABSTRACT

In this paper is described a continuing education program for the development of organizations that incorporates elements of adaptive learning.

This program has a central path of development to guide the evolution of a company from the late stages of entrepreneurship to small company to a transcending company, based on best practices and quality models.

Four development dimensions are considered, on which a set of criteria is evaluated in an initial diagnostic and according to the company's performance, a customized learning path and specific tasks are defined for each organization to gain knowledge and then incorporate the tools and best practices acquired in their operations. In order to optimize the diagnostic and generation of the customized learning paths, automated tools were developed with the engineering faculty.

The program offers the guidance of the consulting-professors and engineering students of Monterrey Institute of Technology and other benefits and support of strategic allies such as Corporate Chambers and Government institutions to the companies that participate in it.

During the implementation of the program some topics are validated, such as the need of creating customized paths for each organization for their development, and the potential of adaptive learning techniques in the lifelong learning programs.

Keywords

Adaptive learning, continuous learning program, continuous education program, adaptive learning platform, learning platform.

INTRODUCTION

Use Life-long learning as a skill in companies is very important nowadays. [1] Several programs exist to contribute to developing knowledge and skills for professionals of different backgrounds and working environments.

The professionals and the organizations that seek for continuous learning programs, come from different fields, contexts, and backgrounds and usually they have different

requirements, [2] interests and priorities. It is important that the impact of the continuous learning programs that are offered is equally transcendent, regardless of the circumstances of the professionals or the organizations, so several challenges in how to develop learning organizations, how to promote learning cultures, how to enhance learning processes and how to build learning communities [3] are identified to close the gap between organizational needs and expected results of continuous learning programs [4].

Adaptive learning is one of the biggest educational trends, it has been used to adapt courses for the different kinds of learning styles of the students. A platform with the information and different exercises adapts the experience of the different students according to their necessities and preferred kind of exercises, creating a unique path for each student, raising the challenges of the advanced students and strengthening the weaknesses of the challenged students. Moreover, the adaptive learning platforms are enriched with artificial intelligence algorithms, so that not only the course designer identified paths are generated for the student, once the platforms are used by several students, new connections and different paths are created by the platform with the knowledge generated by the experience with previous users. As explained by Kleisch in [5], "Andragogy characterizes the importance placed on adults' need for self-directed learning, based off the premise that learning occurs only when students experience a need to learn. This is a big reason why adaptive learning has so much potential for adult learners. When using adaptive learning systems, learners are given the specific opportunity to mold their formal education which increases their competence and moves them towards the end goal of achieving one's full potential".

In this paper, we present a continuous learning program that was designed to provide unique paths for the organizations and professionals enrolled in the program, based on a diagnosis, which can be further developed and enriched with adaptive learning techniques applicable to other programs.

The program was requested by a group of businessmen, who considered that in the region, there was no availability of a continuous learning program that contributed to the development and competitiveness of the companies in the region, offering tools and providing advisory for their continuous improvement.

One of the main goals of the program concept, was that the program should be able to generate a transcending impact in the organizations and professionals that participate in it, through customized development paths, providing specific tools to improve the detected weaknesses of each participant and advising them in their implementation. These characteristics will optimize the effort and time of the organizations enrolled in the program, since they would only be required to attend the modules that would have a bigger impact on their development.

The program was developed with basic elements of adaptive learning, and even when currently the program considers face-to-face sessions and not an e-learning platform, basic programming tools were developed, which can be later integrated and expanded into an adaptive lifelong learning platform which could offer the benefits of the program and expanded benefits of adaptive learning and artificial intelligence to the continuous education programs that are offered.

Methodology

The program was developed with a chamber of business men, defining three main stages or levels of development of companies from late stages of entrepreneurship to a company that transcends. The levels were defined as gold, silver and bronze and the objectives of each level are explained in figure 1:



Figure 1. Levels of the program

Four key dimensions were defined as pillars for the companies' development in the program, the content, requirements and tools were developed around this dimensions to provide guidelines for the continuous improvement of the organizations (see figure 2):



Figure 2. Development dimensions of the program

Specific elements of each dimension were mapped on the 3 levels of the development of the companies. However, since each company has different maturity in each element of the different stages, making all the companies go through the whole process would not be optimal, therefore, some elements of adaptive learning were integrated to the program as schematized in figure 3.

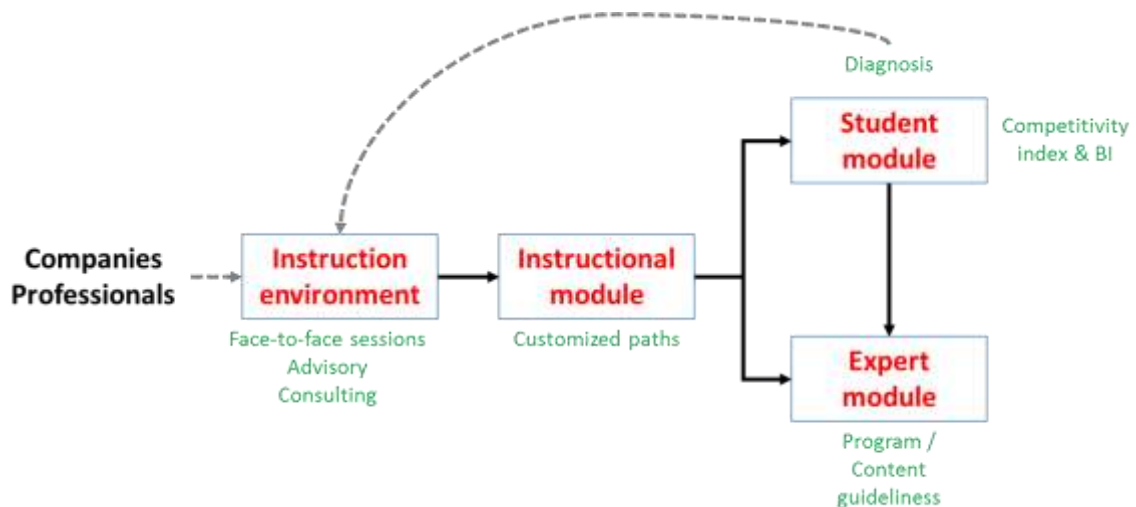


Figure 3. Adaptive learning elements of the program.

With the objective of providing a customized the experience of each organization, a



diagnosis was designed in order to verify the required elements of each dimension in the 3 different levels, and with the results of the diagnosis, the most adequate starting level of the company (gold, silver or bronze) will be determined and the elements of the corresponding level that have already been developed or that are yet to be developed by the company will also be identified and acknowledged to the organization and the consultants.

The diagnosis helps identifying a starting and final point for the companies, it was developed with a grading scale so that a competitiveness index can be calculated for each of the companies and for the group of companies that participate in general, which can be useful for business intelligence analysis of particular elements and dimensions that are strengths or weaknesses in different industries, regions, or any particular segmentation that can be of interest. This data can be exploited, not only within each group, analysis and conclusions could be inferred from the experience of several groups and this could be further potentiated with the use of artificial intelligence algorithms, which are usually part of adaptive learning platforms.

Using a basic version of what an expert module of an adaptive learning platform could be, the different elements of the diagnosis were mapped to the different topics of the modules of the program and to the different tools that were developed, and with a basic version the instruction module, customized paths of development were created for each company.

The program was enriched as well with advisory and support from consulting professors in the detected weaknesses of the different companies, optimizing the time of the companies and the consulting professors

CONCLUSIONS & RECOMMENDATIONS

A It is an interesting case that the development of this continuous education program, that incorporates elements of adaptive learning and other trends of continuous education programs, emerged from the vision of local business men and professionals in the region, contributing to close the gap between their requirements and the offered continuous learning programs.

A first group of organizations is currently enrolled and is about to conclude the program, the following observations and learned lessons have been made:

The companies have a large variability with respect to the maturity of the different elements and requirements. Most of the companies have more maturity in specific dimensions and a poor progress in other dimensions.

Every module in the program could be marked as mandatory, recommended or optional in the path of each organization, it's challenging to balance the group size of every module since some of them could be mandatory or optional for most companies.

Since the companies that attend have been diagnosed and are in the modules with companies that have similar strengths and weaknesses, the shared experiences between the companies result in deeper connections and possible alliances between them.

The business intelligence analysis obtained from the program could generate very valuable conclusions about new ways of improving the competitiveness of the organizations that participate in the program.

The elements of adaptive learning that were incorporated in the program, proved to be a



valuable differentiation of the continuous learning program for the organizations. The program and its elements of adaptive learning could be expanded into a full adaptive life-long learning platform that would adapt the content that the organizations obtain through multiple channels and have a large scale impact.

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