

Towards a Skill-oriented Educational Scenario: Vocational Training as Use Case

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Abstract:

E-learning changed drastically the way we teach and learn. New forms of education are now possible thanks to recent advances in information and communication technology. Also, learners nowadays have different needs, they learn at their own pace and are interested in using technology in the classroom settings. One of the current challenges in education area is how technology could be integrated in the classroom and how to design an educational scenario model in respect to student's characteristics and curriculum constraints. More specifically, this papers deals with the issue of designing a skill-based learning program aligned to society and labor market demand. As result, we propose a methodology to construct a skill-oriented educational scenario adapted to vocational training.

Keywords — Vocational Training, Skill-oriented Training, Competency-Based Approach, E-learning, Instructional Design.

I. INTRODUCTION

E-learning is a new way to deliver content to student based on Information and Communication Technology (TIC). Learners can access to digital material anytime and anywhere. Technology enables access to education and help rethink educational practices. For instance, many e-learning systems tries to maximize student satisfaction and to enhance the learning experience. To do so, a range of techniques are proposed in order to engage students in the teaching learning process.

E-learning has a great advantage because it allows lifelong learning and could be an alternative for students who dropped out early from school. It helps them complete their learning and learn new skills to meet the labor market demand. Still, this requires a new form of education that should be flexible called "Vocational Education and Training". Over recent years, there has been an increased interest in developing skills in educational systems to insure the teaching meets industry-required needs. The purpose is to support student's career readiness; promote development of skills such as problem solving, lifelong learning, critical thinking,

communication, self-direction, decision-making and collaborating skills. In this sense, educational technology provides students with authentic and meaningful learning and assessment activities. Each learner is supported in the way he/she learns and should be provided with opportunities for learning helping them think at a high level.

Vocational Education and Training (VET) called also Career and Technical Education (CTE) is used to prepare students for a certain work position. It is based on job-specific training which used hand-on-labs with contributors from both educational settings and professional in the field of interest. The advantage of vocational training is that is helps student learn technical skills, soft skills, discipline work, entrepreneurial skills, etc. VET helps students develop the skills necessary to fulfill a specific tasks that are expected in work settings. Another great advantage of vocational training is the time frame required to accomplish a training program, it is short compared with conventional educational.

The purpose of vocational training is to constantly improve educational programs to conform to the ongoing rapid change and prepare students to be as competent as their international peers. At this stage, we suppose that one of the main issues regarding 21st century education is to guide learning towards development of skills according to society needs and there is a growing interest into incorporating technology to enhance the learning experience.

Vocational education aims at developing learner's ability in accordance to skills and interest they have [1]. In this paper, we are interested in the alignment of technical and vocational education and society needs. The remainder of this article is organized as follows: first, we explain the difference between competency-based education and skill-based education called also vocational training. Then, in section III, we describe a methodology to construct skill-based education model. Finally, we give a conclusion and present our future work.

II. SKILL-BASED EDUCATION IN VOCATIONAL EDUCATION AND TRAINING

Authors [2] define VET as: "part of education which makes an individual more employable in one group of occupations than in another." Vocational education and academic education are different, the first one is focused on teaching knowledge and skills and the second one is focused on practical skills that will be used in the daily work.

Vocational Educational and Training places emphasis on development of competencies and skills rather than acquiring knowledge. By completing a curriculum, learners are ready to perform a set of tasks related to a particular profession. In this section, we discuss Skill-Based Education and different types of Vocational Education and Training.

A. Skill-based Education

Skill-based Education is an educational approach, called also Outcome-based Education or Competency-based Approach.

Its learner centered and postulates that learner have different backgrounds, knowledge and goals, they proceed according to their own pace, the purpose is to make learning flexible and personalized according to students characteristics. Skill-based education is implemented differently in educational systems. For instance, some authors propose to organize content in a way that conveys its structure to learners, this means that the content should be divided into small learning resources and the order of presentation is rearranged according to learner's characteristics. Some authors posit that learning outcomes should be clearly defined at the beginning of learning and students should be assessed against a standard of performance. The choice of the skill-based education is mainly influenced by the fact that it is an orientation that puts the learner at the heart of the learning process and takes into consideration his / her abilities, prerequisites, learning style, motivation, etc. It is an approach that focuses on the learner's action on knowledge rather than knowledge itself, and aims to ensure a better use of skills in real-life situations. This allows the learner to progress at his own pace towards the mastery of a skill starting from a problematic. Learners have different learning paces, prerequisites and motivations, so they do not progress in the same way [3].

However, one of the problems affecting most education systems is the mismatch between training and employability, more specifically between the education system and the labor market.

B. Types of Vocational Training

To propose a methodology adapted to professional training, it is first necessary to analyze professional training systems closely. Authors [4] postulates that professional systems can be classified into three categories:

(1) Vocational and technical secondary schools: These schools rely on a practical environment to foster learning and prepare students for a potential profession. The aim is to provide students at risk of school dropout, another path in which they might experience a new form of learning.

(2)**Formal apprenticeship:** vocational education is provided through formal training in schools preparing students for a specific job. This type of training ensures an optimal transition between school and work.

(3)**Dual apprenticeship:** Teaching and learning are done through a contract between the company and the school. The acquisition of knowledge and skills is done at school and the implementation of skills in a specific context is done in a job situation. Some learners have difficulties in the university and may be reoriented towards vocational training, which may facilitate their integration into the job market.

latent trait that may not be easily observable and needs specific contexts and conditions. In the other hand, [6] definition tends to better define competency as not job-specific and he distinguishes between the knowledge as ‘input’, capability as “processing knowledge” and performance as a “tangible result”.

According to [7][6][5][4] there is a difference between the word “Competence” and the word “Competency”. Competence is “skill-based” while competency is “behavior-based”. The first one shows what a person is able to do while the second one is related to human factors which helps an individual reach a standard of performance. For [8] skills refers to interactions of a person with his/her environment and the performance is a result. Skills are developed by the practice, which is called “Learning by Doing”, a step by step process to achieve a high-level of performance. Another definition was proposed by [9], there is two kinds of competencies, the ones related to a domain knowledge and cross-disciplinary ones like attitudes that one needs in order to acquire autonomy.

[10] posits the difference between «Skill» and «Competency», a skill is a set of tasks that a learner can do with a level of proficiency using several equipment and learning materials while competency is a group of skills that one uses to reach a specific standard under conditions.

For [11], competencies are capabilities which take the shape of human actions and resources, and a capability is linked to a subject in order to reach a goal.

IMS-RDECO specification defines competency as: “the word competency is used in a very general sense that includes skills, knowledge, tasks, and learning outcomes”. The HR-XML Consortium HR-XML defines competency as: “a specific, identifiable, definable, and measurable knowledge, skill, ability and/or other deployment-related characteristic (e.g. attitude, behavior, physical ability) which a human resource may possess and which is necessary for, or material to, the performance of an activity within a specific business context”. These specifications aims to define competency using XML (eXtensible Markup Language) making use of it in e-learning systems,

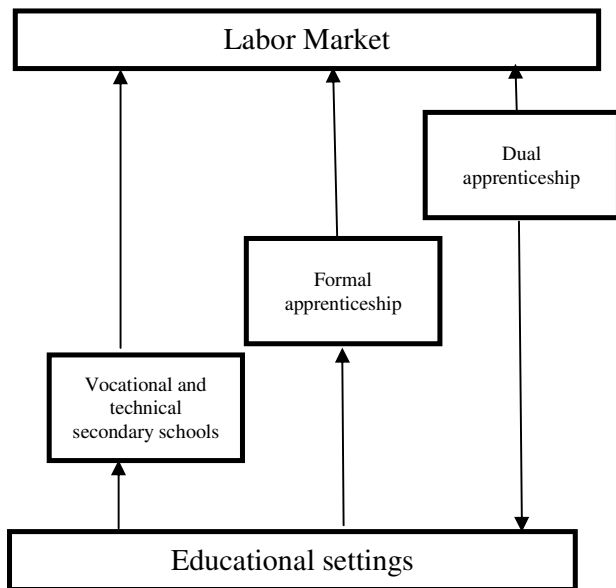


Fig. 1: relationship between Labor Market and Educational Settings

C. Skills vs Competence

The first one to propose a definition of competence was Professor David C. McClelland, he defined competency as “The knowledge, skills, traits, attitudes, self-concepts, values, or motives directly related to job performance or important life outcomes and shown to differentiate between superior and average performers”[5]. In this definition, the concept of competency is directly linked to the context of job. Competency is used as a scale of performance. The word competency is usually linked to underlying qualities, it refers to a

to ensure interoperability and exchange of competency definitions.

III. TOWARDS A SKILL-ORIENTED EDUCATIONAL SCENARIO

In order to conceive a skill-oriented educational scenario it is important to take into consideration competencies as skills. For instance, it's important to analyze a work situation to understand what competencies one should develop so to be able to perform a task. It's an anticipation of what student will be able to do as work and from this point we derive what are competencies and skills he/she should develop. This analysis helps instructional designer to create educational program which are aligned with performance and skills required by marketplace demand. By specifying at the beginning of training what should be learned and to what extent (performance). The teacher is also able to create instructional units that best address learning outcomes. It is also important to think of assessment activities able to evaluate student's performance against a standard of performance.

The goal of a skill-based educational scenario lies in the ability to prepare students who will be immediately operational in their workplaces. The students are aware of their skills and potential. Unlike traditional training that aims to train students in different fields, there are some who will have to undergo professional training for their integration in a job. This illustrates the need for a vocational training model. To construct a Skill-oriented Educational Scenario, it is recommended to follow three steps: (1) Analysis of work situation (2) Establish a competency framework, (3) Construct a training program.

A. Work Situation Analysis

To design an educational scenario adapted to professional training, it is first necessary to analyze a job. The objective of this step is to describe in a much detailed way the reality of the exercise of a function, making it possible to reproduce as faithfully as possible in the pedagogical scenario. Thus the gap between skills developed in school and those required by the job market can be narrowed.

To analyze a job situation, it is appropriate to conduct interviews with several profiles, collect useful information from them based on questionnaires or based on direct observations of people in a job situation. It is also very important to analyze the inputs and outputs of each function as well as the process followed by the employee.

At the end of the analysis of the job situation, a document describing a profession is created. The document should include: the job title, the sector of activity, the conditions of exercise, the level of responsibility, the conditions of professional insertion, and the possibilities of promotion. The document also contains the description of the various tasks and business processes. Then, for each task it is necessary to specify their difficulty, the conditions of their realization and the criteria of performance. Finally, the analysis of the job situation must give rise to set of knowledge and skills that the individual must acquire in order to exercise this particular profession.

B. Establish a competency framework

After the step of work Situation Analysis in one company (ideally several), it's about organizing key skills by profession. For each key skill, we should identify the knowledge that the student must acquire, the process of developing skills, and the means of evaluating them.

The competences described in the framework are performance oriented. It is built primarily based on point of views of employers and observations of employees while performing a task. This is why it can be used both to establish training programs and to enhance the recruitment process since it explains all the skills required for a given profession and could be used as scale. It is also a reference for students because it allows them to understand the requirements of the job market and to identify the professional opportunities offered to them.

The competency framework must be mutually agreed by different stakeholders who must ensure it best describes the job situation.

C. Curriculum Production

The third step is to establish a training program that aligns with the needs of the job market. The

training program must be detailed enough to guide learning. It must include the following elements: a general presentation of the training program, the educational objectives called also learning outcomes, the prerequisites of the training and the structure of the course.

For each skill that the training aims to develop, a description of the expected behaviour and valid and reliable assessment methods is necessary.

Modeling languages can be used in order to design instructional units. For example, [12][13] use visual EML (Educational Modeling Language) for creating a learning scenario

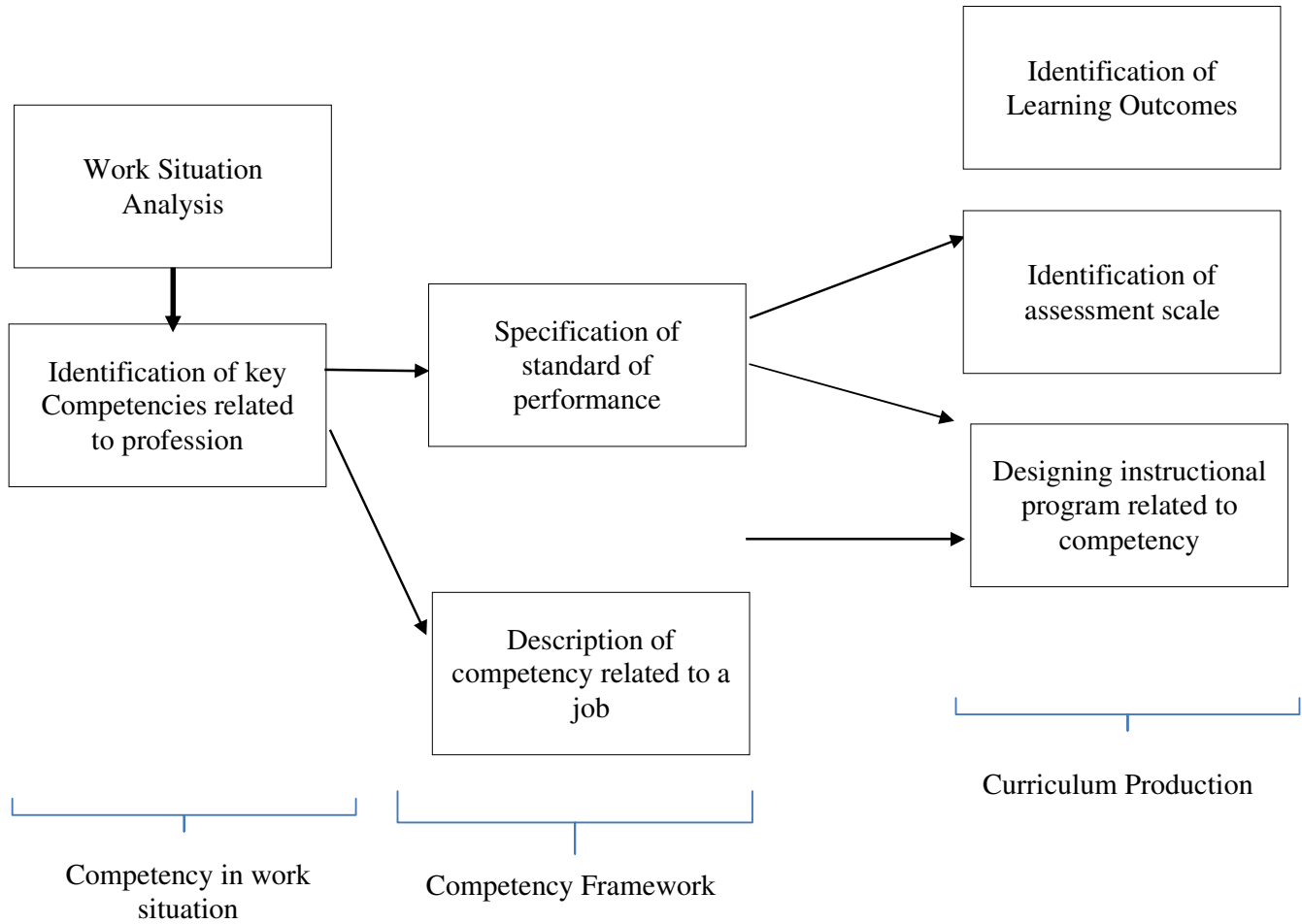


Fig. 2 Methodology of construction of skill-based educational scenario

IV. DISCUSSION

The purpose of vocational training is to transform the requirements of labor market into skill oriented educational scenario. The purpose is to align learning activities with job market demand, this

happens when the system provides student with authentic learning which prepares them to getting a job.

For instance, vocational training uses competence frameworks so to design curriculums based on competences one should develop. Without a good definition and design of competencies, resulted curriculum can be invalid and wouldn't help student to perform a task in a professional area. Progression in a skill-based training is determined by demonstration of what students are able to do, and this progression should be assessed against a standard of performance. The advantage of vocational training is its flexibility, students are invited to learn the subject they are interested in and can be prepared to work in area they choose. It is also learner-centered and self-paced. The time frame required to accomplish a training programs, it is short compared with conventional educational. Also, the educational scenario states clearly what is expected from learners at the end of the program in terms of performance.

V. CONCLUSIONS

In this paper, we presented a methodology to construct a skill-oriented educational scenario, we discussed the special case of vocational training as use case. The purpose is to align learning program to society and labor market demand. This illustrates the needs of contributors from both educational settings and professional in the field of interest. The presented methodology could be used to conceive instructional units in respect of job specification or to conceive assessment activities related to standard of performance.

For future we aim to promote the use of e-learning in Vocational Education and Training. For instance, the focus is on how e-learning could foster the teaching learning process in vocational education.

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