

Towards a computerised system of pedagogical orientation to succeed in Morocco University

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Abstract

The implementation of educational reform in Morocco is the founding of the LMD system in 2003 and the operationalisation of the contingency plan (2009-13/Project 21: Establishment of an information and orientation system efficient) had as objectives the centration on the student, also, it is coming to resolve the most persistent problems of which high rate of redoubling and dropping out. The introduction of LMD reform in Morocco uses particularly the orientation at this moment, which is still lacking. Indeed, the orientation toward the university courses depends on academic achievement, social original and family expectation. Our research attempts to answer on this major problem of orientation: we propose ontology of the concept of orientation, which adapted to the higher learning environment for students; and will offer computers tools to allow students to integrate a scientific journey, which responds well to their learning needs and helps them succeed their university studies.

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1. Introduction

This communication treats the orientation from an education side in Moroccan culture. The Moroccan education had known several changes, among them the emergency programme (MEN, 2009) elaborated by the Moroccan Minister of National Education of the reform 1999, also after the establishment of the emergency programme of the reform 2008, which brings modification to the preceding reform in programme and the teaching methods (MEN, 2009). Among the basic criteria for improving the rate of success in Moroccan education, we find the orientation, according to the emergency programme 2009–2012, which adopted as a methodology the orientation approach based on the approach by competence.

Many research studies affirming the influence of the orientation on school failure and dropout (Riviere, 1996), which drew our attention to the importance of this influence on the students.

- School failure is one of the points of dysfunction of the French school system, which can be fixed with the installation of an orientation culture throughout life (Maarrawi, 2013);
- The education systems make a ‘sorting’ of the students in various sector, various school and classes according to their degrees, which takes part in the growth of the inequalities and iniquities (Field, Kuczera & Pont, 2007);
- School failure is often assimilated to a bad orientation and vice versa (Vermes, 2005);
- The non-selected orientation is constitutive of school failure (Thelot, 2004);
- Alaluf et al. (2003) affirms that a bad orientation can be worse than a failure;
- Baluteau (1998) confirms that the school is responsible for school failure. The mechanisms of the school orientation are naturally based on the equality of opportunities. This idea is clarified by Perrenoud (1993), which affirms that the school system built excellence, failure and academic success of the students according to the professors and the inspectors who evaluate them according to the criteria of the education system;
- Chauveau and Cuveau (1996) define six types of problems gathered in the expression ‘school failure’, among them the procedures of elimination or relegation. The negative orientation indicates the redoubling, the placement in a structure or an underprivileged sector;
- School failure is an inevitable consequence of a prioritisation of the school sector. This hierarchy is encouraged by school professors and administrators, which causes consequently according to the author, school failure (Prost, 1985).

As a result of these research studies, we deduce that school failure depends in the first place on a bad orientation. Therefore, this has a fallacious effect on the education and company systems, in general, within sight of the figures presented by the association of the students foundation for city (AFEV), this association affirms that a bad orientation favour school dereliction (Mons & Dhorasso, 2012).

The school orientation has become a problem, as Riviere (1995) affirms, it is one of the main reasons of school dereliction in Quebec and that’s due to the lack of information on the studies that the students has. So, a bad orientation is among the reasons of the studies abandonment among

graduates of the secondary in Quebec. According To Charet (1997), one on five students have difficulties of school and professional orientation. Also, 3.4% of the students stopped their studies in the professional training on the secondary because they consider to have made a bad choice.

In addition, the statistics of the manpower registered into the national report on the development of education (Men, 2013) announced an average rate of the abandonment during the three cycles within the Moroccan academics, which exceed the third of registered numbers. Vis-a-vis this result, the situation of the Moroccan educational academics is in an uncomfortable and very critical position.

According to the data from the Ministry (Men, 2013), the Moroccan education suffers from a high rate of school abundance, which is primarily due to poor educational orientation. This leads us to ask the following questions:

- Is it necessary to give meaning to the pedagogical orientation?
- Is this direction used to meet the needs for new post-baccalaureate Moroccans?

We will answer all these questions in the second part.

2. E-Orientation system

The orientation is the choice which is an indicator of the motivation for Corbiere (1997), and it's a central determinant of academic success.

The effectiveness of the education and training system could not be complete without a powerful device of orientation which ensures an adequacy of student needs to guarantee his academic success (MEN, 2009). In this part, we focus on the orientation as a choice, the choice of the sector and/or profession is made in the last year of high school.

2.1. Definition

In English, there are two activities of 'orientation':

- The process which divides the students in various ways of formation, sectors and options ('students distribution');
- Assistance with the individuals in the choice of their school and professional future ('vocational guidance', 'school and career counselling') (HCE, 2008).
- In French, the term is defined taking into account these two activities:
- Defines as an action to develop the individual towards a study, a formation, a trade or towards itself for a better development;
- Consist to 'direct someone or to move oneself, especially in regard to the studies and the profession' (Champy, 1994).
- Drabik-Podgorna (2001) specifies the role of the academic and professional orientation to:
- Lead individual;
- Decide and monitor individual;
- Evaluate individual;
- Help individual;
- Accompany individual.

As to the pedagogical orientation, it's specified in the student accompanying in a personalised training itinerary finalised by an evolutionary future project built by the subject himself. This support will extend beyond the school to a sufficiently stable insertion (Carof & Simon, 1998).

Consequently, according to Professional Order Of the advisers and Advisers of Orientation of Quebec OPCCOQ, the orientation can be directed towards the studies and the trades (professions):

- Academic orientation: Defines as an action to direct the child towards the form of teaching, which is appropriate to him in order to develop to the maximum all his possibilities, this orientation aims to not wasting the energy and the time of an individual who took a bad direction (way). As the school orientation is an action (a trigger) which helps to prepare the professional orientation (Lafon, 2001).
- Professional orientation (vocational guidance): Defines for the first time in France by a decree on 26 September 1922 as 'the whole of the operations which precede the placement by young people in the trade and industry, which have as goal to reveal their intellectual aptitudes, morals and physics' (Charmasson, 1987). In the same way, Alissawi (1986) defines the professional orientation, as 'helping the individual to choose the profession which is appropriate for his capacities, preferences, motivations and future plans (hopes and aspirations)'.

We note that the orientation helps students to grow better in the academic and professional field. In addition, professional orientation is based on the result of academic orientation. Consequently, the wrong orientation may consider the loss of time and resources, resulting in abandonment by

university students, which requires putting the individual to the good academic or professional direction that suits him (Aldahri, 2005).

2.2. Orientation processes

According to Boulahcen (2005), we can deduce an adequate orientation process to the E-orientation system following these steps:

- Give information;
- Request more information;

Establish E-portfolio (Bentaib et al., 2014; Mohammed, Mohssine, Mohammed & Abdelouahed, 2015);

- Advisor via peer-peer interviews or questionnaires;
- Accompany with the mental and personal development;
- Support and facilitate the parent involvement in the academic orientation;
- Facilitate academic and professional insertion;
- Document paper or numerical format;
- Evaluate;
- Follow and redirect.

These steps will try to give motivation for post-baccalaureate, especially in the choice of his courses.

2.3. Orientation influence

The orientation takes into consideration the desires and motivations of individuals, in addition to those of the society which has its own needs and requirements. The choice of training is a complex phenomenon that concerns primarily students but also their immediate and extended families, family friends, teachers and those responsible for the orientation (Moumoula, 2005).

Several levels of contradictions deduced between the individual and collective dimensions involved in the orientation (Moumoula, 2005):

- The desires of the 'families' and the needs of national competence standards;
- The desire of the learner and the desire of parents;
- The gap between the desire of the learner and the availability of training;
- The level of the learner (abilities, skills).

All these intra-individual and extra-individual contradictions between concerned individuals, availability of training and skill requirements explain the complexity of career choice and the difficulty of ‘orienting oneself’ and of ‘being oriented by others’.

According to the descriptions, we can infer that the orientation helps to build a well-defined academic and career project, as it is related to the knowledge of the learner online, we define the list named as following: ‘E-Orientation, EOrientation, E-orientation, Eorientation, eOrientation, eorientation’. The orientation is related to several learning objects (Bourgin, 2011), these objects can be classified using ontology techniques (Guerss, Aitdaoud, Douzi, Talbi & Namir, 2014).

2.4. Orientation ontology

2.4.1. Ontology

This last decade ontology has played an important role in various fields, such as knowledge engineering, the artificial intelligence, etc... Our work focuses on the knowledge engineering in a specific area, according to the ontologies.

The ontology means a set of concepts that are connected to each other with relationships, which describes an area of knowledge. A concept may be an idea, an object, a notion, etc...

We find several definitions of ontology among them:

- ‘Ontology defines the terms and the basic relationships of the vocabulary of a domain, as well as the rules which specify how to combine words and relationships so as to extend the vocabulary’ (Neches et al., 1999);
- ‘An ontology is an explicit specification of a conceptualisation’ (Gruber, 1993);
- ‘Ontologies are a partial and formal specification of a common conceptualisation’ (Guarino, 1997).

The ontology elements are:

- A concept: can be a principle, an idea, an object, a notion ..., they are also called the classes of ontology;
- Relations: they are associations existing between the concepts of a domain;
- An instance: an extension of ontology in a particular field, it is also called bases knowledge.

2.4.2. Construction ontology of E-orientation

a. Specification of Requirements

Field of knowledge: Field of the university orientation and career

Objective: Used to fulfill the needs of the emergency plan Najah 2009–2012—Program (MEN, 2009), by facilitating educational orientation task.

Users: Students, post-baccalaureate, trainers, parents, advisor, etc...

Sources of information: All documents which are interested in the field of the university orientation and career.

Range of ontology: Test, presentations, courses, video, etc...

b. Conceptualisation

This design will describe in detail the ontology of orientation that was proposed by Fatima zahra Guerss et al. (2014). We start by defining glossaries of the terms used: concepts, attributes and relations.

c. Glossary of the term

This glossary describes the concepts, instances, attributes and relations between concepts that specify the domain of educational orientation. As shown in the Table 1 below:

Table 1. Glossary of the term

Name	Description
Orientation	Process which indicates the way of academic success
University	Institute of higher education
Sector	A section or branch study
Competence	Knowledge drawn from an experiment
Portfolio	A portrait that describes a set of characteristics of a post-baccalaureate or student

d. Glossary of dictionary of the concepts

In this part, we focus on the construction of a concept dictionary, for each concept it is assigned an identifier ‘idConcept’ which describes the properties that characterise the concept. The Table 2 presents a concept dictionary:

Table 2. Glossary of the concepts

Name	Attributes	Relations	Synonym
Orientation	idOrientation	Include edge uses	School choice of Direction
Portfolio	IdPortfolio	Edge uses include	User profile
Coaching	idCoaching	Edge be Include	Psychological accompaniment

e. Glossary of dictionary of the attributes:

In the following task, we aim to build the attributes, this table will contain a precise attributes description of the concept dictionary and the whole set of limits and constraints on these values. The Table 3 presents an extract of the attribute table:

Table 3. Glossary of the attributes

Name	Type	Default value	Cardinality
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IdOrientation	String	Orientation	1..n
IdPortfolio	String	Portfolio	1..n
IdCoaching	String	Coaching	1..n

f. Glossary of relations

The last task is the construction of the relation table, for each relation we define:

- The name of the relation;
- The name of the main concepts and targets;
- The cardinality source and target.

The Table 4 presents an extract of the table of relations:

Table 4. Table of relations

Name of relation	Principal concept	Target concept	Principal Card	Targeted Card
Include	Orientation	Coaching	1.n	1.1
edge uses	Orientation	Portfolio	1.n	1.1
Edge Be	Tutoring	Courses	1.n	1.n

2.5. Methodology

Among the methods that summarise the pedagogical orientation, we can find: data collect, data classify, data Analyse, optimise the difference of data and models of sectors or send the suggestion.

2.6. Tool

There are several tools of the ontology implementation (Oberle, Volz, Staab & Motik, 2004) which can be commercial or free, we decided to use Protege2000 (Knublauch, Fergerson, Noy & Musen, 2004), which is a free open-source Java tool providing an extensible architecture for the creation of customised knowledge-based applications.

2.7. Implementation

Following the development of the work of Fatima zahra Guerss et al. (2014), we have made a new approach to the E-orientation ontology that has been established to remedy its limitations, including:

- The orientation is regarded as a concept rather than a field;
- The design is not well-defined in the domain;
- Construction is not detailed much of the domain.

First of all, we must build the OntoOrientations (Guerss et al., 2015), which is the key concept that model the field of orientation. The Figure 1 shows an extract from our ontology implemented under Protege2000 (v4.3.0).

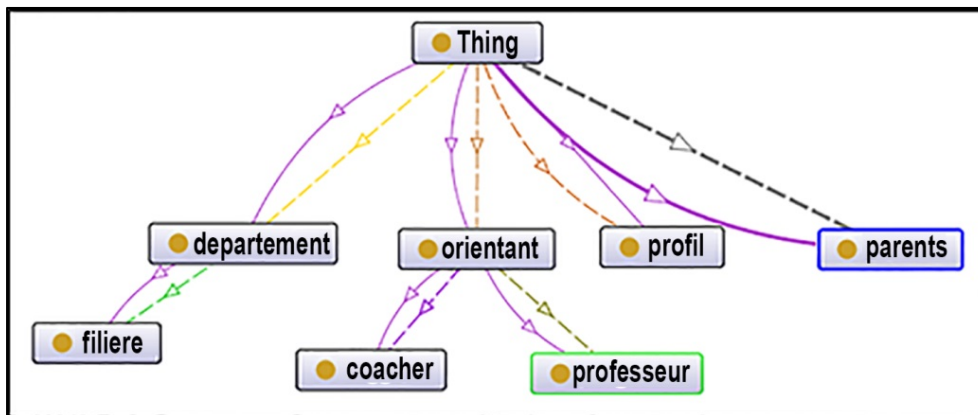


Figure 1. OntoOrientation implemented under Protege2000.

3. Conclusion

Given the importance of the orientation, we studied its influence on career choice in higher education and professional of the post-baccalaureate. These influences allow us to carry out analysis of the Moroccan educational orientation, especially in scientific institutions. This brings us to give meaning to the Moroccan educational orientation of our E-orientation system by using the ontology. Especially, ontologies are widely used in many fields due to several advantages of the ontology such as interoperability between systems, data sharing, reuse of knowledge on a domain, etc... However, the complexity of ontology lies with its construction because there are several ways to do it. Thereafter, we will implement our system 'E-orientation' in the Jena framework.

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