

Towards an Implementation of the Concepts of E-Learning 2.5 through one Group of ten Master's Learners: Case of the UML Course

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Abstract—The aim of our article is to apply the concepts of the E-learning 2.5 in a group of ten Master's students during the UML course in the I-School of Rabat, Morocco. This survey generated interesting results on the collaborative approach during the UML course. Indeed, 50% of the students find the learning method very satisfactory and 40% satisfactory. Learners are also satisfied with the content published on the class wiki since 50% is very satisfied and 30% is satisfied. This very promising and flexible approach in time and cost can complete or replace traditional learning of a small group of learners. It adds the possibilities of self-evaluation compared to the E-learning 2.0 opportunities and therefore proposes a simple, collaborative, constructive and measurable e-learning which covers a wide public composed mainly of the younger generations,

Index Terms— E-learning 2.5, Web 2.0, methodology, questionnaire collaboration evaluation..

I. INTRODUCTION

The collaborative Web 2.0 proposed by Tim O'Reilly [8] was a real advance in the web since it considers no more the user as a simple consumer of information but as a potential producer of content and therefore an essential actor for the Web 2.0[4]. It presents a new way of production, communication, sharing and dissemination of information by providing a complete platform of collaborative tools [7]. These ones can create, edit, publish content and positions the user at the center of the network. As result, this situation creates an increasing number of communities of practice, thus participating in a wide communication, sharing and dissemination of information [9]. In the educational component, the social tools of Web 2.0 are simple and easy to use. They permit to create and publish any type of educational content such as courses, exercises, homework or bibliographies and digital resources which allows an informal collaborative learning. This new approach of teaching called E-learning 2.0[3] is essentially based on the participation of learners resulting in a collective intelligence on the network [5]. The E-learning 2.0 is a distance learning based on the notion of collaboration using Web 2.0 tools to achieve the training content [11].

It seems to be a social network where a community of practice centered around one domain and where its members interact and learn together [3]. The E-learning

2.0 is based on the collaborative community learning through the use of collective intelligence [5]. In this context, the learner becomes the creator of his content and can exchange through the social interaction with his community of practice instead of exchanging only with the learners of his class [14]. The new e-learning is based on social learning and use of social software such as blogs, wikis, podcasts and virtual worlds such as Second Life [10,158]. This type of learning is characterized mainly by the interaction, collaboration, autonomy and sense of responsibility. E-Learning 2.0 introduced the concept of learning community [6] which aims mainly to support the development and to solve educational problems. It allows learners to communicate with their community by creating a collective intelligence and then recreate the traditional classroom learning and interaction between learners.

In addition, the Learning 2.0 can be used in private companies, public institutions and universities as part of the initial training and also as part of the distance training throughout life to improve the competences of learners and therefore the productivity of the company [2]. The Web 2.0 tools can be used by learners to complete the formal learning experiences [1]. Some researchers speak about the E-learning 3.0 [11] which is relating to the future Web 3.0, but until today, it is not yet defined and standardized. E-learning 2.5 is a collaborative process that allows learners to create a collaborative content of their courses through Web 2.0 tools while participating in the evaluation of their training through an online questionnaire 2.0 [14].

E-learning 2.5 is composed of three iterative phases and improves the E-learning 2.0 by creating a new step concerning the pedagogical evaluation which is piloted by the tutor. This step is based on an online questionnaire administered to different actors in the training by the tutor. This questionnaire is designed to measure the achievement of the objectives established from the beginning of the training. It could measure learner satisfaction and quality of produced content.

In this context, the teacher defines:

In the first phase, the general and specific objectives of the training and skills to be acquired by learners and proposes a rich bibliography on the class blog. It devises thereafter the plan of the course content in various parts and assigns each part to a specific learner.

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In the second phase, and through web 2.0 tools, each learner will propose content candidate for publication on the class wiki if the teacher validates it. The teacher validates the content if it is of good quality. He can request some changes and upgrades by giving advice and relevant bibliographic references. All collaborative content validated by the teacher will be online on the class wiki by the tutor. He will administer through the social network of training in the third and final phase, an online questionnaire that will measure the achievement of objectives established since the beginning of the training.

The objective of this paper is to implement the distance learning process based on the E-learning 2.5 for a group of ten students during the UML course for Master's students of the I-School of Rabat. This electronic survey, lasted one week and within the entire class has participated, resulted in satisfactory and encouraging results on the approach of e-learning 2.5.

It used an online questionnaire hosted on a public cloud with free office tools. In order to further the understanding of the data obtained, we have programmed permanent discussion with them. As a result, 90% of the learners find that the learning method is satisfactory and 80% of learners are satisfied with the content published on the wiki class.

In the next section, we will present the progress of the investigation 2.0 and the concerned population; then we expose the use of information technology and Web 2.0 content used in the paragraph 3. We propose later in the fourth paragraph, the identification of the limits of the present education system in class and the use of E-learning 2.0 by learners. In the last paragraph, we will present the evaluation of the course contents published by learners and evaluate the learning method used. We conclude our article with a general conclusion where we will present a variety of perspectives.

II. CONDUCT OF THE SURVEY

Before presenting the results of our investigation, it is important to remember that its objective is to evaluate the learning method used and the course contents published by the learners. To achieve our goals, we used a survey based on learner satisfaction.

The questionnaire design was made by the teacher responsible of the UML course and was assigned to the student leader (She won the prize for the best student in her class in 2011) who administered the questionnaire to the whole class by using a link on the web. The survey focused on the entire group composed of nine students in addition to the teacher who played the dual role of the learner and the teacher's validator. He has participated in the creation of collaborative content like other learners by using Web 2.0 tools to live with them directly the problems encountered during the use of this mode of teaching. We have found that the youngest respondent was 23 years old while the oldest is 46 years old.

This is a population relatively young with a Master's level. It promotes the use of a collaborative approach and web 2.0 tools, which allowed establishing the approach of E-learning 2.5. The following figure shows the distribution of our population by age.

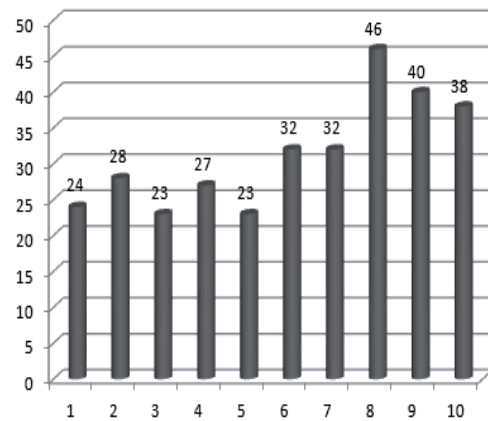


Figure 1. Distribution of respondents by age

For the distribution by sex, it should be noted that there is a balance between the sexes since a total males represented 40% of our population against 60% for females as shown in the following figure:

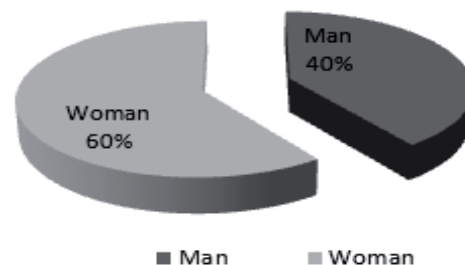


Figure 2. Distribution of respondents by sex

A practical remark during the course is that the women learners generally are more active in their participation in the different activities of the course. It is proved during the process of learning and evaluation as they are always the first to make the required homework and with high quality.

III. INFORMATION TECHNOLOGY AND CONTAINING

For hardware devices, all respondents reported that they have a portable computer and a mobile phone for already 3 years and more. In addition to its hardware devices, 60% of students affirm that they have other types of equipment permitting the connection to Internet such as Tablets, iPod, 3g keys. For internet access, all students also say they still have access and they are connected several times each day. 30% of them find that their connection speed is very good, 40% found it satisfactory and 30% are moderately satisfied, but no one find that it's not satisfactory. For connection locations, 90% of learners are connected from home, 70% are connected from their cell phones and their 3g keys, 40% are connected from the research laboratory and 10% are connected from a public space. The following figure shows the locations of internet connection of different learners.

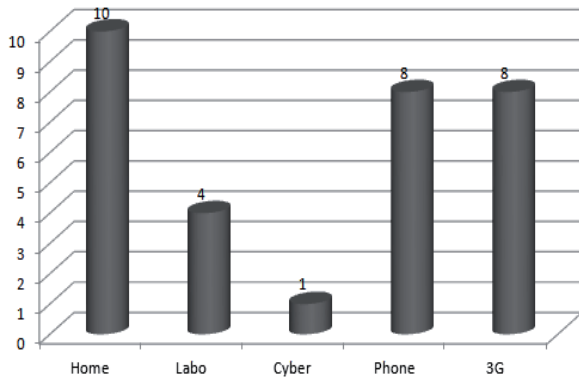


Figure 3. Locations of the internet connection

Learners use the Internet for personal and professional goals, for example we can mention:

For personal use we can include the consultation of the email or the social network, the entertainment, media, news, downloading some tools often free.

For professional use we can include learning through literature searches, to achieve some complementary of courses, research, lectures, readings, critical analysis, collaboration and communication with classmates and some teachers. For the use of Web 2.0 content, all respondents reported that they use always the web 2.0 for personal and professional purposes. Thus, we can conclude that Web 2.0 is a familiar concept by the totality of respondents which will allow us to benefit from their opinions and experiences. The most used tools of Web 2.0 are wikis with 90%, followed by blogs with 80%, RSS feeds with 70%, social networks with 50%, videocasts and podcasts and tags with each 40% as illustrated in the following figure

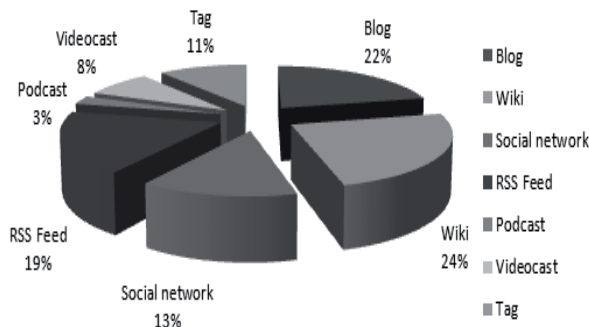


Figure 4. The use of Web 2.0 tools

We note that wikis and blogs are positioned in first place for their use in the world of teaching and learning, which gives them importance in the process of E-learning 2.5. With regard of the satisfaction of the use of Web 2.0 tools, 30% of students are very satisfied, 40% are satisfied, while 30% are moderately satisfied. Learner satisfaction is not ideal because of the contents of Web 2.0 do not benefit from a static validation by experts which reflects directly on the quality of information published so that it can be erroneous in some cases.

IV. THE CURRENT EDUCATIONAL SYSTEM IN CLASS AND THE USE OF E-LEARNING 2.0

For the satisfaction about the current educational system, 30% of learners are very satisfied, 50% are satisfied, 10% are moderately satisfied and finally 10% are not satisfied. The satisfaction of the learners concerning the current education system are illustrated in the following figure

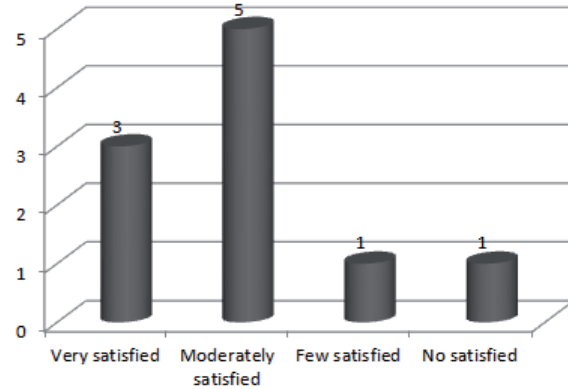


Figure 5. Satisfaction of the current education system

The causes of dissatisfaction of some learners are diverse. Some of them find that the programs are overloaded for the 3rd cycle student, which affects the time allocated to research. They also claim that the courses titles are very interesting while the content of some courses does not reflect its appropriate title. They complain about the non-regular update of some courses compared to current requirements and evolution of its discipline. Moreover, in their opinion, the learner should be more implicated in strategic decisions especially those concerning the educational component and the various changes that this training cycle can have. They also note the absence of a platform for distance learning of the type LMS or LCMS that can provide a space for sharing and collaboration. They suggest certain additional resources such as course and research documents that can improve the quality of learning. Concerning the teaching methods, the students found that these teaching methods are often transmissive and outdated. For them, teaching methods are different and depend on the type of the course and the frequency of use of the learning method. For them, the training consists of 90% of courses using the masterly courses, 70% of courses using the tutorials, 50% of courses using seminars and only 30% offer new ways of teaching, compared to the current UML approach that uses E-learning 2.5. For the knowledge assessment, 30% of students want knowledge assessment to be face to face or presential, 30% want knowledge assessment by video conferencing and 40% want the evaluation in hybrid mode. About the learning through Web 2.0 tools, all the students affirm they know and have used the E-Learning 2.0. 40% are very satisfied with this type of education and 40% are moderately satisfied. The Learning is made 90% by Videocast, 80% by wiki, 60% by blogs and social networks, 40% by podcasts and feeds and finally 20% by tags. The following figure illustrates the use of web 2.0 tools in the current formation.

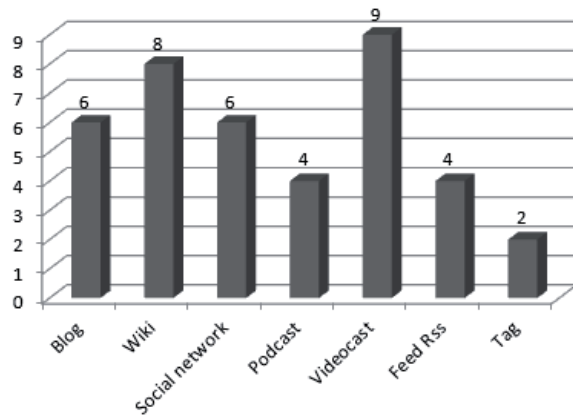


Figure 6. The use of Web 2.0 tools in the current training

Learners use more the videocasts, followed by wikis then blogs and social networks for their research concerning the scientific and academic information (courses, presentation, research ...). Therefore, Podcasts and RSS role is to complete the training to provide a diversity of teaching tools and improvement. Concerning the desire to learn the information science which is the role of all learners through the E-learning 2.0, 90% of students think they would like to participate in sessions of E-Learning 2.0 in information science, while 10% do not wish to participate at this time. All those who want to participate say that this mode of education offers the opportunity to learn anytime and anywhere, 60% of respondents say that this type of learning provides an exemplary environment of interactivity, 40% say that it cultivates self-reflection and reduces training costs. On the other hand, the 10% who do not participate affirm that their refusal is because of the rarity of offers of this type of training, the relatively expensive cost and non-specific training of some teachers and tutors to this mode of education. In addition, all respondents want training on e-learning 2.0 will to be as complement training in addition to regular course. For the choice of learning mode, 20% want the synchronous mode, 20% in asynchronous mode and 60% want the mixing between these two modes. They want 80% of the course by teleconference in synchronous mode, in addition to have online consultation of all courses with multimedia mode. 40% prefer online consultation of multimedia supplements of the course and 40% prefer online brainstorming to solve several educational problems. 70% want the E-Learning 2.0 in all courses, while 30% want it only in certain specific courses.

V. EVALUATION OF COURSE CONTENT AND LEARNING METHOD

Relating on the publication in the wiki class, all students proved they have already published content on the wiki in the classroom. Half of the learners found that the content published is very satisfactory, 30% found it satisfactory and finally 20% found it moderately satisfactory. Of course, the content published has been validated by the teacher responsible and obviously many modifications and improvements from the learners were made during the implementation of the course. The following table presents the weights assigned by the teacher responsible on all the content of the UML course.

TABLE I. STATIC VALIDATION OF THE TEACHER

Code Learner	Code Content	Title Content	Static note
E1(L)	C1	Component diagram	Satisfied
E2	C2	Object diagram	Moderately satisfied
E3	C3	State machine diagram	Satisfied
E4	C4	Deployment diagram	Moderately satisfied
E5	C5	Collaboration diagram	Moderately satisfied
E6	C6	Activity diagram	Very Satisfied
E7	C7	Composite diagram	Satisfied
E8	C8	Sequence diagram	Satisfied
E9	C9	Use case diagram	Moderately satisfied
E10	C10	Class diagram	Very Satisfied

Each content published on the wiki can be modified if the teacher accepts the change; In this case, the quality of the information must be greater or equal than the quality published. Of course, in this case, the latest version is the best. The contents of the contributions show the efforts of research, synthesis and devotion to the competition between the different members of the group of learners. In addition to their participation in the implementation of the course contents learners participated in the evaluation of published content. The details of the dynamic evaluation by learners are presented in the following table:

TABLE II. MATRIX OF DYNAMIC EVALUATION BY THE LEARNERS

		Code of content				
		C1	C2	C3	C4	C5
Code of Learners	L1	VS	S	S	VS	MS
	L2	S	S	S	S	S
	L3	VS	VS	VS	VS	VS
	L4	S	S	S	S	S
	L5	S	S	S	S	S
	L6	S	MS	MS	S	S
	L7	S	S	S	S	S
	L8	VS	VS	S	VS	MS
	L9	S	S	S	S	S
	L10	S	MS	S	S	MS
		C6	C7	C8	C9	C10
L1	NS	S	MS	MS	VS	
L2	S	S	S	S	S	
L3	VS	VS	VS	VS	VS	
L4	S	S	S	S	S	
L5	S	S	S	S	S	
L6	VS	S	MS	S	VS	
L7	S	S	S	S	S	
L8	S	S	VS	S	VS	
L9	S	S	S	S	S	
L10	VS	S	S	S	VS	

VS: Very Satisfied, S : Satisfied, MS: Moderately satisfied, NS: Not Satisfied

We observe that we have two weights, the first which is initially assigned by the teacher on the published content and another as a vector of values affected by learners on each content with anonymous manner. The global dynamic weighting of the course will be the sum of all weights assigned to each content by the learners during

each new session. The weights of each type of note are presented in the following table

TABLE III.
MATRIX OF WEIGHT OF THE NOTE

Code note	Type Note	Weight
VS	Very Satisfied	3
S	Satisfied	2
MS	Moderately satisfied	1
NS	Not Satisfied	0

As we have already seen, to modify an existing content by the tutor training, it is necessary that the new note content given by the teacher be greater than the initial one. In adopting this approach, we will have always a good quality of course content. This possibility will help to reduce or increase the initial weight according to the relevance of the published information. This dynamic weighting improving the relevance of research, sorting by the quality of the information and thereafter proceed to final archiving or removing content if it becomes useless. For problems encountered during the preparation of collaborative content, 50% of students complain of the scarcity of pertinent references and short period for the preparation of the content. 10% deplored a lack of assistance during the creation content. For learning some new skills during this mode of learning, 80% of students say that they have learned some skills by publishing on the wiki class as collaborative work, mediation, sharing, use and manipulation of Web 2.0 tools, in addition to some technical knowledge. With regard to the learning method, 50% of students find the learning method is very satisfactory and 40% satisfactory. It is a real success for this type of learning based on Web 2.0 tools and questionnaire. In addition, this mode of learning is free and open and is based on the willingness of students to learn to attain the objectives targeted since the beginning of the course. For the limits of this mode of learning, the learners reproach the lack of experimentation and autonomy as well as a lack of supervision in the use of Web 2.0 tools. They also complain about the absence of a standard charter for structuring the content to publish. They conclude that the problem of updating is a very big problem. There needs to be daily updated content published and validated before and after the publication in a continuous manner. They think it is necessary to adopt this type of education initially as a complement of some courses and thereafter as an alternative to traditional education while planning evaluation and recovery sessions.

VI. CONCLUSION

The free survey that lasted one week was permit to evaluate the achievement of objectives in adopting the approach of E-Learning 2.5, in addition to the evaluation of the course content published on the wiki collaboratively by the teacher, all students, and finally by the tutor. Although the survey on e-learning 2.5 is limited to a purely academic population and limited to a group of 10 learners, it allowed for testing a new method of collaborative teaching as a complement to academic education in Morocco.

We conclude various comments, suggestions and proposals from the respondents for E-learning 2.5. Among the strengths of this type of education according to the

survey, is its lower cost and requires only willingness on the part of different actors in e-learning. Among the limitations of this mode of learning, we note the lack of experimentation and autonomy in addition to a lack of framing and guidance for the use of Web 2.0 tools. Moreover the E-learning is not recognized or organized until today in Morocco. Indeed, there is a great lack of interest by the competent authorities of the national policy on distance learning. Furthermore the initiatives of universities and schools that offer this type of training are not recognized contrary to those developed in other countries.

- Adopt E-learning as a complement to training at the national level;
- Adopt E-learning 2.5 to a progressive manner in some courses;
- Recognize the equivalence of E-learning diplomas with the presential diplomas;
- Create the Best educational content on the web.

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Wiki Address of collaborative course : <http://fr.esi2cisuml.wikia.com/wiki/Accueil>

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