Improvement of Students Curricula in Educational Environments by Means of Online Communities and Social Networks

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Abstract. The school is part of our society, which increasingly uses more and more the social networks. Therefore, we must continue this momentum, not only by using them, but by also guiding the students of its proper use. Thus, most educators working with high and middle level schools are aware of the involvement of young people in social networks, but few of these educators are prepared to deal with them the issue. Experts discuss the risks and benefits of such sites, and the role of schools, to offer a comprehensive approach that addresses the needs of online students. This paper seeks a solution to the complex world of social networking in education, where users can belong to a social network not as such, but as a set of objects that define a necessity. This research work tries to redefine social networking of an online community, where objects that work on the same stage define the team. To do this we propose a school architecture, where objects define the curricular activities, with known characteristics.

Keywords: Educative systems, social networks, cloud computing, Web Services, systems architecture, Students Curriculum, Educative Curricula.

1 Introduction

In the current educational environment, students are heavy users of social networks, blogs, wikis, instant messaging, etc. On the other hand, not all teachers have much interest in the use of these tools for educational use. The idea is to define a system that unifies these users, in an environment that accommodates the concept of online community. Taking into account the scenarios in which teachers perform their work, and the active approach which can build on-line communities, to capture the attention of the students, and thereby achieve the learning/teaching objectives presented for each teaching unit. Therefore, we must continue this momentum, of using on-line communities, not only by using them, but also guiding the students to their proper use. We are going, to try, to understand the potential of on-line communities for learning, to create new learner-centered models. This idea proposes that students

continue participating, within their education, in identifying routes more interesting and relevant to them. We are not offering just a wide range of options for on-line communities, but also designing learning networks. This aims to provide students a space, outside of the lifelong structured programming, to explore their passions supporting their peers and tutors. Thus, by involving students beyond the limitations of time and classes space, first it allows educators to continue working with them throughout the week, besides, it gives them the invaluable opportunity to share their experiences, which occurred outside the classroom with the learning community.

Therefore, the challenge that we are facing is to give them the opportunity to share their interests and activities constantly occurring elsewhere. If we do that, we will be able to know more about the profile of our students, and we can create new opportunities for all and thus we will facilitate their learning. As students have more connectivity and access to technology resources than ever, developing new practices and platforms to support them in how to manage their learning opportunities solves this challenge. The proposed architecture here, allow users, through online communities, to implement their curricula schedules. This architecture for educational environments with contemporary functional or structural didactic courses, is developed in the cloud, and defines how users can interact with each other under the same activity, through milestones for students.

- Didactic function: Emphasize teaching mental operations to analyze, induce, infer, evaluate, choose, encode.
- Didactic structure: teaches mental tools as notions, concepts, feelings, attitudes, words or gestures.

As we can see, these two types of teaching are generalists, and the aim of this paper is to address these needs, patterns, from the point of view of ICT applied on on-line communities.

2   State of Art

In addition to the equipment found in schools, the vast majority of students have mobile devices with 4G connection, 94% of the users, between 16 and 35 years, of "Tuenti" [1] has mobile, 84% of the users connect to internet through their mobile device, and 47% have contract 4G connection data service. By following the classification of social networks [2], and the pedagogical possibilities of these in the educational settings [3], and the collaborative tools [4], we found that:

D. Boyd and Nicole B. Ellison [5] define social networks as a set of Internet-based services that allows users to build a profile in the system, establish their own relationships and see their list of connections. It was observed, that there is an association between the social network definition and the relationships between adolescents. It's because students in-school space is bounded, and they establish their relations of friendship according to this environment, as it is demonstrated, the impact of social networks in these contexts is high [6]. Inclusive education means that members of a school community learn together, irrespective of their origin, including students with

learning disabilities. This definition implies the same opportunities to participate, so student's can be benefit from an education adapted to their educational needs, not only to students requiring significant curricular adaptation. This approach about on-line communities, make us thing about the basis of the teachers within the education systems, *in other articles that have been treated*, in considering the curricular programs, working sessions and the carried out evaluation of the students [7]. All this must be done with usability and quality criteria in the development of interfaces [8].

Currently, in the educational environments, there is no architecture that is adapted to these needs, where the stage is completely focused on school and the relationships between its users, and is done through the activities and specifications that teachers provide them. As mentioned previously, the work is collaborative, and not about creating a new social network, for teachers and students, it's about creating a social network that allows teachers to work the learning contents throughout the courses schedules. Final y the platform, in development, emulates the characteristics that the mobile devices and Smartphones, which students and teachers may possess and view the applications with.

3   System Needs and Definition

The rise of social networks and mobile devices, in youth groups, requires the creation of a system that allows the use of social networks for educational purposes *the problem comes from the high percentage of rejection to use these from parents and teachers*. Their reasons are usually associated with the loss of time, and the content that social networks might possess, making it in the major cause of their rejection to its use.

Usually, students move freely in these environments and, they are able to manage their own data and profile without facing difficulties. The proposed system, aims to make a direct link between the social network and the educational environment. Normally, all educational environments contains a documentary system, related to a management application that performs the maintenance of students, and their associated curricular functions, necessary for teachers, to monitor their educational process, this monitoring of work sessions schedules leads the student activities. The idea is to manage these activities as if it were a social network, by applying them for educational use, the process that will bring out the information, monitored by the teacher who must assess his students, and must pay attention about what content they are visiting and consulting.

The educational process in a collaborative work for primary and secondary students, involves the following steps: (1) Data collection, (2) Information processing, (3) Share information, (4) Treat information, (5) Presentation of the contents and its application. To ensure, always, the correct application of these steps, a set of patterns in each of these phases, must be established. All of these patterns are already defined in social networks, but the inclusion of specific needs, is done, for the scenario in which it takes place. The scenario, will be a class session, in which a timeline is established to allow students to carry out guided activities, this timeline is related to the timing of their course, which in his turn is stored in the system, to create the set of

objectives, and pedagogical data, achieved by each student during this process. This pedagogical information is stored, for its posterior use in reports, that teachers emit of these students over the time, and favor their educative improvement. Also, these patterns will facilitates, to teachers, the preparation of specific educational activities as needed, or assess the student group as a whole.

4   Educative Patterns Used within Online Community

The educational patterns, through which teachers and students interact with educative online community, are:

- **Data Collection:** The students collect the data, in the initial phase of the teaching-learning process, using different teaching methodologies within various search systems, to perform their activities. This trains the student to filter the educative content, make searching actions, and to collect the important, needed, data.
- **Processing of Information:** Once the data is collected, students can then specify which of these data are valid for the activity to be performed. The student structures this information, in order to achieve the objectives of the performed activity.
- **Sharing of Information:** Once the information, which students will share with their peer group, is processed, those can begin to have an overview of the different parts of the activity to complete his information, view.
- **Treatment of Information**: The student performs a process of information processing, structuring and formatting, to achieve the completion of the activity, and thus to make its presentation. In this process is where the student actually performs the synthesis, and study where he must integrate and adjust the information to achieve the specified objectives.
- **Presentation of Content and its implementation**: The student begins to execute the presentation of the activity to the group of students.

These educational patterns interact within an online community or social network in *Cloud Environment,* where these behave as objects that interact between each other. The reason of why we have defined a cloud of patterns is to have the possibility to include them in any educational platforms, placed in any placed, and thus, we can add these features to the curricular management tools of the schools.

5   System Architecture

The system that we propose here is flexible for deployment, and enables interoperability between platforms, that may depend on it, allowing interaction via mobile devices. For that, its architecture allows the inclusion of the needed items for its realization, since it is based on a Cloud system, thanks to its support of the CSchool [8]. The system architecture is integrated with management software for schools and, in turn, gives support to the official curriculum, which comes from central servers.

The first raised question was: how to make the inclusion of curriculum materials in a social network? This was the starting point, thus it covers how social network interact with the elements of the curriculum, so that teachers can develop their work in it, and prepare well their activities. The operation of this online community is based on using the patterns, for the activities, the teachers want to apply, and then they proceed with the publication of these in the cloud. These patterns are all identified and managed in the cloud, i.e. managing the relationships and how two patterns interact between each other. The users, teachers and students, are not registered or housed in the cloud, only the patterns and their relationships, based on the definition of object according to the patterns that the teacher can possess [9]. With this we achieved a flexible and dynamic system, which can be embedded into existing educational platforms, as an embedded object, composed of the data and academic curriculum that the teachers store.

This architecture allows schools to have similar functionality to those of social networks, thus these patterns list increase continuously, with the appearance of new features within the system. Where users, students and teachers increase their knowledge from the interaction of these patterns in the cloud and processing the activities. In the other hand, the system also offers a timing of the activities raised by the teacher, and those developed by the student. Also it contemplates the maintenance of the temporary teaching process, and it dispose of navigation task to go through the academic results, of each student, which goes through the life teaching activities, for each activity and each group within the system. As we are working with learning contents, which are didactic elements, each of them identified in the system with a unique identifier, they stores information needed for its composition, depending on the type of pattern or relationship with the task to perform. However, some properties are common to all of them, these are described below:

- ID: Identifies the full learning content in the system.
- Type: The type of learning content identification to allow its construction.
- Parent_ID: Identifies the ID of the parent upon which the pattern will traverse the entire sequence of learning contents associated with the initial pattern.
- Start_Date: Controls the start of the activity.
- Activity_Date: A data structure that stores a file editions.
- End_Date: Date of completion of the activity.
- Teaching Information: Stores information of the objectives, content and basic skills to work within this activity, in addition to the information required for student assessment.

Essentially this architecture is a data structure stored in XML, which can be accommodated in a database or in an XML document, which from SQL procedures, it is possible to interact directly with the system using APIs [10] [11]. The hosting of documents, with the educational content, is done in compressed files, that enables it's storage in any FTP server [12], accessible from most applications, using programmed functions packages for different languages, which convert it in a hybrid system that allows the inclusion of social networking features in educational environments, by specifying the relationships between the identified patterns. Such relationships are not

based on personal criteria, such as conventional human friendly relations, but it is the curricular needs of students, or that the teachers require for each educative process. Fig. 1., shows the system architecture and how it is included within the educational platform, which also allows browsing the identified educational patterns through the objects defined in the cloud. The different elements that compose it are:
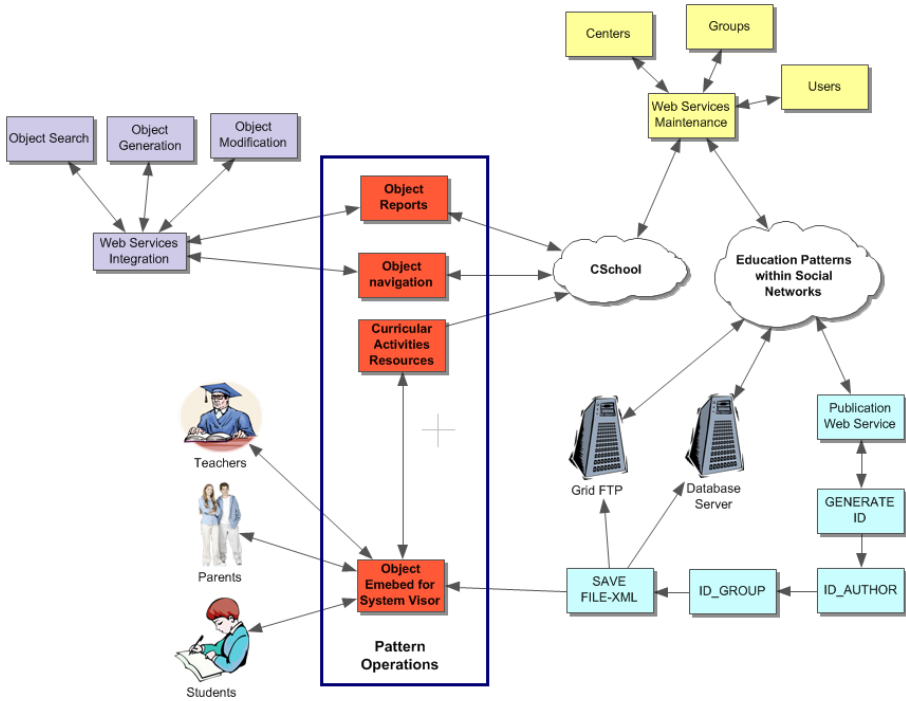
Fig. 1. System architecture, describe the creation of patterns related to the relationship educational system and social networks

- **Educative Patterns within Social Networks Cloud**, it hosts the objects of the patterns required for the teaching-learning process, in addition to their operations. It also stores the relationships and objects created for the users of the system. This cloud offer publishing services, for this we use Web Services, which will contain the business logic, required for storing the pattern information in the server. It is an XML file, which is identified by the ID fields, of the file, the Author and the Group.
- **CSchool** is an educational platform for schools management [DUI 2012]; it includes the basic needs of the educational curricula and activities. This platform communicates using Web Services for maintenance labors (yellow), and to keep the two systems synchronized with the users. Being a cloud system, we decided to create a composite bridge to facilitate the interoperability and communication between the different systems (orange).

- **Reports Object** produce a report patterns represented by the objects in the cloud, from there, depending on the user level, the reports that users have can be obtained.
- **Navigation Object**, it takes users to visualize the patterns represented by the search criteria, which they may determine, from here after selecting the object users can proceed to view and edit the data.
- **Embebed Object for System Visor** is the entry point from which users will see the objects in a session, activity or program.

This architecture can perform a deployment, depending on the conditions of the customer, as the specification and configuration of Web Services enable it to adapt quickly to any platform.

6   Case Study

The presented case study, defines the activity "Going to a Tour", provided by the teacher of the 5th grade, of the "Collegio publico juan XXIII" school (Spain), this activity treats the area of knowledge of the environment, while performing a trip in the countryside, the collected data, by the students, is about the local wildlife. This activity involves the following points: (1) Students must collect the data, i.e. making pictures of the animals and plants, they find during the trip. (2) Students must perform a search of the species, making a classification of the same, performing a scheme of the found species, and finally, adding its characteristics. (3) Students share their information, with their peers, to get the greatest number of species. (4) Students should perform a work, where they can include these features, and make a presentation of the most prominent and the curiosities of the journey.

Using the proposed system, the teacher defines the patterns associated to these points of the activity, these patterns are: (1) Starting the activity, information of the activity, objectives and core competencies to work with. (2) Data collection of animal/plant species. (3) Search for information of the collected data, using Internet (i.e. Wikipedia), students first identifies the species, and they complete it with the necessary information. (4) Sharing of information about animal/plant species. (5) Process of the information by, preparing, adding, and formatting animal/plant species. (6) Process the data as a whole, to structure the information processed earlier, giving the students the opportunity to analyze the environmental setting found in the tour. (7) Prepare the presentation of the content. (8) Final grade and report to parents.

Point 1 and 10, are common to all the activities, they come into two patterns, which do not really have any didactic work, they are management and administration patterns, which prepare students for the steps to be followed, the end report to be given to the parents, and the store of the done work, by the students. In each of these patterns added by the teacher, each activity goes through an evaluation and summative process, which corresponds to the level of achievement of the objectives, as the final grade result for each of these patterns. Each pattern contains a percentage value of the rating data, and a score of the achieved goals, based on the analysis of these data, the teacher views the evaluation of the educative process of the students. After the

evaluation process, the teacher closed the student activity, storing it for future reference by the other members of the educational community, and classifying it as curricular structure, according to where it was created, and finally, generating a report to be sent to the parents.

7   Conclusions

The development of this document matches the needs that teachers have with the use of social networks. From the standpoint of teaching, these networks facilitate communication between users of the educative centers. From our experience in the creation of educative platforms, and our study of social networks, in the last few years [6, 9, 13, 14, 15, 16], we found that there is a really need to incorporate necessary materials into social networks, for educative staff who use them, and at the same time, these patterns should be easy to use. So in a scenario, that describes the educational world, these patterns will represent the curricular activities, which require the needs of social networks and their tools to be carried out by the users. The set of elements that are hosted in the cloud, provides a social networking aspect of the curricular patterns interrelate with each other, timed and monitored by the teacher. In the other hand, the teacher controls all elements within the proposed educative social network, which allows the implementation of activities, following the patterns that the relations of objects establish.

After launching this system, for its validation in an educational environment, the users with whom we have worked were teachers from primary and secondary school, the first problem we faced was when we named the words "social network", thus, most teachers only associated it to "Tuenti" and "Facebook", and the dangers that it entails. While in fact, we are presenting a networking of patterns, which will give users the feeling of being in a social network tailored to their working environment. Users define objects to interact with other unknown users, but the object itself is part of a community of objects that are defined by the users' needs, and these are the same for all system users. Relations between objects give full content to the provided patters to students and for its future growth.

As a future work, we are studding the possibility of the inclusion of these activities and their scores on the students' personal curricula, to improve the whole educational curricula. By making use of intelligent agents, the system can make a selection of what goals and what core competencies require modification, to help teachers in their teaching process.

References

1. Tuniti, Spanish social network, https://www.tuenti.com/?m=login
2. de Haro, J.J.: Redes Sociales en Educación (2010) ISBN: 9788441527966
3. Levis, D.: Redes educativas 2.1 Medios sociales, entornos colaborativos y procesos de enseñanza y aprendizaje. Facultad de Ciencias Sociales de la Universidad de Buenos Aires. RUSC vol. 8(1). Universitat Oberta de Catalunya, Barcelona (Enero de 2011) ISSN 1698-580X

4. González, F.S.: Herramientas colaborativas para la enseñanza usando tecnologías web: weblogs, wikis, redes sociales y web 2.0 (2005)
5. Boyd, D.M., Ellison, N.B.: Social Network Sites: Definition, History, and Scholarship. Journal of Computer-Mediated Communication 13(1) (2007a),
   `http://jcmc.indiana.edu/vol13/issue1/boyd.ellison.html`
6. Fardoun, H.M., Alghazzawi, D.M., López, S.R., Penichet, V.M.R., Gallud, J.A.: Online Social Networks Impact in Secondary Education. In: International Workshop on Evidenced-Based Technology Enhanced Learning, EBTEL 2012, Salamanca (Spain), March 28-30 (2012)
7. Ciprés, A.P., Fardoun, H.M., Mashat, A.: Cataloging Teaching Units: Resources, Evaluation and Collaboration. In: Proceedings of the Federated Conference on Computer Science and Information Systems, pp. 825–830, ISBN 978-83-60810-51-4
8. Fardoun, H.M., Paules, A., Alghazzawi, D.M.: CSchool: DUI for Educational System by means of Clouds. In: 2nd Workshop on Distributed User Interfaces: Collaboration and Usability CHI 2012 Workshop, Austin, Texas, USA (2012)
9. Fardoun, H.M.: PhD Thesis, ElearniXML: towards a model based approach for the development of e-learning systems. University of Castilla-La Mancha (2011)
10. Oracle Database: XML SQL Utility, `http://docs.oracle.com/cd/B19306_01/appdev.102/b14252/adx_j_xsu.html` (last access: June 2012)
11. Oracle Database: Oracle9i XML API Reference, `http://docs.oracle.com/cd/A97630_01/appdev.920/a96616/arxml24.html` (last access: June 2012)
12. Postel, J., Reynolds, J.: Protocolo de Tranferencia de Ficheros (FTP). Network Working Group (IEN 149) (1985)
13. Fardoun, H.M., López, S.R., Alghazzawi, D.M., Castillo, J.R.: Looking for Leaders: Reaching the Future Leaders in Education through Online Social Networks. Procedia - Social and Behavioral Sciences 47, 2036–2043 (2012), doi:10.1016/j.sbspro.2012.06.945, ISSN 1877-0428
14. Fardoun, H.M., López, S.R., Alghazzawi, D.M., Castillo, J.R.: Education System in the Cloud to Improve Student Communication in the Institutes of: C-LearniXML++. Procedia - Social and Behavioral Sciences 47, 1762–1769 (2012), doi:10.1016/j.sbspro.2012.06.897, ISSN 1877-0428
15. López, S.R., Fardoun, H., Alghazzawi, D.M.: Coaching for Students: Parents Tutoring Children as part of their Educational Process. In: Proceedings of the Federated Conference on Computer Science and Information Systems, pp. 863–870, ISBN 978-83-60810-51-4