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# El reto de enseñar y aprender en una red social académica. Un estudio de caso en la Universidad de Santiago de Compostela

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**Abstract**
Here we present the experience of the Stellae research group (University of Santiago de Compostela) in the use of academic social networks as a means for teaching and learning in Higher Education. It is an experience using student e-portfolios as artefacts spanning the breadth of teaching, learning and assessment processes. The teaching approach respects student diversity, promotes autonomy, proposes an elimination of barriers between formal and informal learning spaces and aims to encourage self and socio-regulated learning. The study aims to analyse the social network conditions that stimulate the development of these processes and how to use data generated in this context to improve proposals. We worked from a qualitative perspective combined with learning analytics quantitative techniques. The results show improved teacher access to data regarding student learning processes, and better knowledge of student network behaviour and motivation data. We conclude that the use of social networks creates a participation structure among students that provides great opportunities, fosters self and socio-regulation skills and promotes a positive correlation between the number of interactions and marks obtained.

**Resumen**
Este artículo presenta la experiencia y la investigación del grupo de investigación Stellae (Universidad de Santiago de Compostela) en el uso de redes sociales académicas como medio para la enseñanza y el aprendizaje en Educación Superior. Se trata de una experiencia que trabaja con e-portafolios de los estudiantes como artefactos que atraviesan a lo largo y a lo ancho los procesos de enseñar, aprender y evaluar. El enfoque de enseñanza respeta la diversidad de los estudiantes, favorece su autonomía, propone eliminar las barreras entre los espacios formales e informales de aprendizaje y pretende potenciar el aprendizaje auto y socio-regulado. La investigación se propone analizar las condiciones de las redes sociales que estimulan el desarrollo de estos procesos y cómo utilizar los datos que se generan en este contexto para mejorar las propuestas. Se trabajó con una perspectiva cualitativa combinada con técnicas cuantitativas de la analítica del aprendizaje. Los resultados evidencian mejora del acceso del docente a los datos del proceso de aprendizaje del estudiante; conocimiento del comportamiento en la red del alumnado en el grupo clase y datos en relación a la motivación. Se concluye que el uso de redes sociales genera una estructura de participación entre el alumnado que ofrece grandes oportunidades; posibilita la adquisición de habilidades de auto y socio-regulación e influye en una correlación positiva entre el número de interacciones y las calificaciones obtenidas.

**Keyword**
Academic Social Network; E-portfolio; University teaching; Self-regulated learning; Social-regulated learning; Digital learning environment

**Palabras clave**
Redes sociales académicas; E-portfolio; Docencia universitaria; Aprendizaje auto y socio-regulado; Entorno virtual de aprendizaje

## 1. Introduction

This paper reports on a long journey by the Stellae Research Group to make teaching at the university a place where learning is paramount. It began some time ago, at the end of the 20th century, with the development of portfolios in both classroom and blended learning experiences. It has continued without interruption and with increasing intensity to create teaching and learning environments that promote the development of virtual learning communities and social networks to capture the processes of teaching and learning from the perspective of protagonists. Innovation, experimentation and research have always been the leitmotif marking the routes undertaken, which are increasingly mediated by technology.

This paper has meant going back over all the work done and written about until now. We have had to rework contents in order to narrate a history of efforts for making teaching and learning at the university a place for opportunities and challenges, for building knowledge and emotions of different generations of students and teachers in the context of a 21st century university.

This article begins by presenting the roots of the experience, delving into the motivations and theoretical foundations of teaching decisions in this context. Secondly, the framework is complemented by an analysis of social networks in teaching as well as the current state of research in the field. Thirdly, the methodology is presented followed by the research results. Finally, conclusions are put forward on the experience and work done over these years.

## 2. Teaching at the university

Teaching at the university, according to Barnett (2002), has to deal with three forms of uncertainty: living with uncertainty (feelings of continual challenge); becoming aware of it and exhibiting it in the teaching situation itself (preparing students for this challenge).

Easy answers or recipes for immediate application to address this uncertainty are not available, but our research and commitment has materialized into a teaching proposal to include students as "*partners*" in learning and pivotal players in the process of their own learning. This approach has meant identifying and cultivating strategies and tools for its implementation, expressly accepting the mediating role of university teachers as learning "*catalysts*" (Hargreaves, 2003).

Teaching at the university is a complex social activity that takes place within institutions loaded with social, cultural and political meanings. There is no single university, but instead multiple faces of a polyhedron consisting of faculties, departments, institutes, and people. Nor is teaching as uniform as the proponents of a predominantly transmissive teaching style might have us think. Similarly, changes demanded in university teaching are not new to the European Higher Education Area (EHEA), though here they have become mandatory innovations. Rather, internal on-site innovations have marked the good practise of many academics, who being critical of their own teaching, appeal for similar standards in teaching as those in research in line with "*scholarship for teaching*" (Lueddeke, 2008; Shulman, 2004), thus calling for greater appreciation of teaching (Aguaded & Fonseca, 2009).

We have gone from a predominantly transmissive education (teacher-centred), to education with a focus on learning (learning-centred or student-centred pedagogies). A change of approach expressed with aphorisms such as "*learning to learn*", "*learning by doing*", and "*learning with others*"; aimed at addressing student diversity, promoting autonomy, enhancing individual and collaborative strengths, helping to explore interests, and appreciating informal time and spaces as generators of knowledge. Never before has the Chinese proverb been so often repeated: "*Tell me and I will forget, show me and I may remember, involve me and I will understand*". Independent learning and lifelong learning stand out as underlying principles supporting continued demands for changes in university teaching practises. These principles carry along concepts such as self-regulation, authentic learning, situated learning, and the interaction of formal and informal settings (Lombardi, 2007; Rué, 2009).

The practice of teaching -- like research -- always takes place in a context of conditions. Having good students requires having good teachers, and we must not forget that the achievements of the former and the efforts of the latter take place within a framework of economic, political, institutional, organizational, curricular, and training conditions. They are not exclusively dependent on the will to change or the use of technological artefacts, as argued by Gros (2008). We have long been working with student e-portfolios (Fraga & Gewerc, 2009; Gewerc, 2009; Gewerc, Montero & Lama, 2014; Gonçalves, Montero & Lamas, 2012; Montero & Alvarez Seoane, 2010) as artefacts that span the breadth of teaching, learning and assessment processes (Agra, Gewerc & Montero, 2003). It is a process of on-going inquiry into our practice, where we try to be consistent with the premises of teaching centred on students who learn in collaboration with others. This teaching approach addresses student diversity, promotes autonomy, enhances the strengths of each individual, encourages them to explore their interests and go beyond the limits of formal learning to appreciate informal spaces as opportunities to continue learning. This proposal requires students to have the ability to self-regulate their learning (Pintrich, 2004; Salmerón & Gutierrez-Barojos, 2012; Vermunt & Vermetten, 2004; Zimmerman, 2001) and requires teachers to commit to a situated learning perspective (Lave & Wenger, 1991) that is authentic (Herrington, Oliver & Reeves, 2003). This framework implies conceiving students as partners in the task of teaching and learning, with initiative and the ability to reflect on their own processes and results, while prioritizing metacognition as a pedagogical strategy (Entwistle & McCune, 2013). It is In line with a cultural and socio-constructivist concept of learning (Saz, Coll, Bustos & Engel, 2011).

In recent years, we have taken a leap forward in the creation and development of an academic social network for creating e-portfolios. Starting in 2006, we have used a platform to host a social network to develop our research on technology integration at the university, as well as our experience regarding e-portfolio elaboration and teacher training.

The set of axes on which our understanding of university teaching gravitates has led us to explore the collaboration generated by using social networks in education, the features of our students' personal learning environments (PLE, Personal Learning Environment) (Castañeda & Adell, 2013), how personal learning networks are configured (Casquero, 2013) and, lastly, how all this can facilitate the construction of e-portfolios that demonstrate what and how students are learning (Gewerc, Montero & Lama, 2014; Rodríguez-Groba & Fraga, 2015; Rodríguez-Groba & Gewerc, 2014, Rodríguez-Groba, Gewerc, Vázquez & Lama, 2015).

During the process, we help students become aware of their own PLE and promote collaboration in the class group's social network, while supporting individual learning and providing feedback (Rubia, Jorri & Anguita, 2009). At play here are the use of an academic social network as a collaborative environment for consultation and information in order to build knowledge, the confluence of different learning resources that blur the boundaries between formal and informal contexts, and the use of individual spaces for posting opinions, readings, text analysis, and so on (blogs, micro blogs, personal files, bookmarks, pages, etc...). All of this results in the formation of personal e-portfolio where it is possible to visualize the knowledge students have built and demonstrated. The proposal is based on the idea that the less structured the activity, the more learning strategies are put to use (Järvelä & Järvenoja, 2011) within a pedagogical framework that supports the development of socio-regulated learning (Rodríguez-Groba & Gewerc, 2014).

What processes come into play in this complex map where students use different types of tools to learn? An open-ended learning proposal, such as the one presented here, together with a diversity of information sources and the vast potential of the Internet enriches the processes of teaching and learning, but its analysis and evaluation becomes more complex.

## 3. Why social networks in teaching?

The introduction of social networking in education is a relatively new phenomenon. The emergence of social software that emphasizes communicative and collaborative aspects (Dabbagh & Reo, 2011), while enabling the transformation of consumer users into producers of all types of content has already advanced considerably in recent times. Blogs and wikis burst onto the scene in the educational field in the first decade of this century but social networks still have only a timid impact on formal academic spaces (Kuo & Tang, 2014; Selwyn, 2009; Hamid, Waycott, Kurnia, & Chang, 2014).

The technological environment of a social network generates conditions for sharing and feedback that enables the development of learning; students can accept others and exchange ideas and experiences (Hew 2011; Yu, Tian, Vogel, & Chi-Wai Kwok. 2010); develop self and socio-regulated learning (Dabbagh & Kitsantas, 2012; Madge, Meek, Wellens, & Hooley, 2009; Roblyer, McDaniel, Webb, Herman, & Witty, 2010) and produce an increase in the level of learning perceived by students (Thoms, 2011). Furthermore, it has also been noted that certain social network properties, such as centrality, have an influence on student performance (Cho, Gay, Davidson, & Ingraffea, 2007; De-Jorge-Moreno, 2012).

Perhaps the benefits are being obscured by the strong presence of social networks like Facebook (Madge et al, 2009; Rambe, 2013), which have a detrimental effect on use as a tool for formal learning. The power of Facebook has generated some controversy and reluctance with respect to educational use. Problems include privacy issues, imposed advertising (Zaidieh, 2012), or the superficial view of content that produces a dichotomous structure of reality based on "*like*" and "*don't like*" (Dussel, 2011).

On the other hand, academic social networks are characterized by two aspects: first, learning is the explicit goal of the community, and second, digital technologies are used to carry out some type of education (Bustos & Coll, 2010). These networks are overcoming the reluctance to using their communication environment for teaching proposals where students make decisions regarding their process and exchange their learning products with one another.

Teaching with social networks implies significant challenges as it imposes transparency in the processes generated by teacher interventions. Integrating social networking into education involves teaching and technological challenges as well as political implications, since an open environment such as this makes it possible, for example, for students to question teachers' educational proposals or their underlying educational concept (Manca & Ranieri, 2014).

University LMS platforms offer closed-ended proposals that provide teachers the capacity for controlling the process. As open platforms, social networks allow students to organize and upload information as they see fit. Discussions are stimulated and issues are proposed, whereby, control by the teacher diminishes and deviations may occur from the initial proposal (Rodríguez-Hoyos, Haya Salmón & Fernández-Díaz, 2015).

While traditional platforms, which are more focused on content, are limited in their ability to encourage student participation and decision making about one's learning process; social networks allow self-paced work, sharing concerns, conducting online meetings, and more stimulation for learning. The comments by colleagues spur reflection and seeing other points of view more freely than on the traditional institutional LMS.

This opening up also helps bridge the (artificial) barriers between leisure and academics, while maintaining a continuous feedback flow between each (Siemens & Weller, 2011).

However, using this type of environment in a formal education context requires adapting the teaching process to a perspective that does the following: 1) encourage student autonomy and help develop their self and socio-regulated learning (Fiona, Järvelä & Miller, 2011) 2) conceive teaching content as something open-ended and in constant construction instead of being packets to be transmitted; 3) understand the importance of collaboration and collective learning

construction (Huber, 2008,p 4) participate in the concept of collective Internet intelligence, where everyone without distinction can make contributions and become content producers; 5) conceive the teacher's role as guiding the process and establishing the necessary scaffolding for each student to find their zone of proximal development and to achieve their objectives (Vygotsky, 1978).

These challenges have helped generate research on the teaching work as well as analysing the potential and weaknesses of using social networking as a teaching and learning environment.

## 4. Methodology

The research work carried out so far has aimed to delve deeper into the characteristics of using social networks in university teaching. The questions that guide the research presented here and which are updated in each academic year are the following: What are the social network conditions that stimulate socio-self-regulated learning processes? How are social network usage and student motivation related? How can the data generated by the social network be used to improve teaching proposals? What tools can help solve problems in the management of such proposals?

The type of approach proposed has led us to address the process with an eminently qualitative view. As stated by Martínez (2006, p.128) "*qualitative research attempts to identify the profound nature of reality, its dynamic structure, and its behaviour and manifestations*". This frame has revealed the learning and teaching processes developed in the experience. We opted for a the case study strategy analysing what happens in classrooms over various academic courses with a focus on students as protagonists, while simultaneously retrieving the voice of teachers. Interviews, observations, journals and content analysis techniques are commonly used tools which have made it possible to delve into the experiences of different subjects in each academic year.

In addition, some quantitative instruments were used. "*Learning Analytics and Knowledge*" techniques were applied in order to measure, collect, analyse and present data on students and their contexts in in the hopes of better understanding and optimizing learning and the environments where it occurs (Siemens, 2010). Among them is Social Network Analysis (SNA), consisting in the mapping and measuring of relationships and flows among people, groups, organizations, computers or other information/ knowledge processing entities (Krebs, 2008). The nodes in the network are the people and groups while the links show relationships or flows between the nodes. This approach stresses the interdependence between individuals and social aspects and raises the need to study situations at different levels: individual, group and community (Luckin, Puntambekar, Goodyear, Grabowski Underwood & Winters, 2013). On this basis, graphs were made representing the tangle of group relationships that occur from the beginning of the course. In addition, network centrality and density indices were obtained. Centrality refers to the existence of a set of relevant nodes with which the remaining nodes establish a great number of relationships, and network density is defined as the proportion of links between the nodes in the graph with respect to total possible links and is an indication of collaboration.

In this context, and in order to expand the type of information collected, the "*MSLQ*" "*Motivated Strategies for Learning Questionnaire*" by Pintrich, Smith, García & McKeachie (1991) was also used to analyse baselines and understand what happens with student self-regulation in the context of a social network.

## 5. Results

Research conducted over these years has yielded important data that have provided feedback for teaching work mediated by the social network. The data emerging from the application of the different tools reveal elements in three dimensions: a) Improved access by teachers to data

about students' learning process as well as quicker and easier evaluation. b) Knowledge of network behaviour for class group and individually and c) data regarding student motivation.

### 5.1. Improving network capabilities as a teaching tool

One of the issues most insistently mentioned by teachers refers to the time required to read network contributions by students, especially when working with large groups. Recall that students upload evidence to their personal space on the network and simultaneously interact with others, discussing and analysing the information together. "*SoftLearn*" software was used (Rodríguez-Groba, Vázquez, Lama & Gewerc, 2014) to respond to the needs of teachers working in this type of space. It was developed to support e-portfolio evaluation based on Learning Analytics.

This tool aims primarily to address two limitations. On the one hand, the time involved in evaluating e-portfolios that are part of a social network, where each student has their own Personal Learning Space and the autonomy to travel different paths, therefore, making it much more complicated than simply giving a mark (Klenowski, 2004). It is often considered an obstacle for teachers using this kind of methodological framework because they have to deal with a lot of documents associated with each personal space. On the other hand, the tool provides faster and more complete information about student processes, thus bringing to the iceberg of all the unseen processes to the surface.

Considering the large number of productions and interactions in the network (2000-3000), using SoftLearn meant not only saving time (53%) over the traditional method of portfolio assessment, but also facilitating evaluation and data access by teachers. It has become an indispensable tool. Student activity can be seen at a glance with graphs and statistics that warn of student difficulties that can lead to quitting the subject. This valuable information enables teachers to build the necessary scaffolding in each case to stimulate continuity and the best use of the subject.

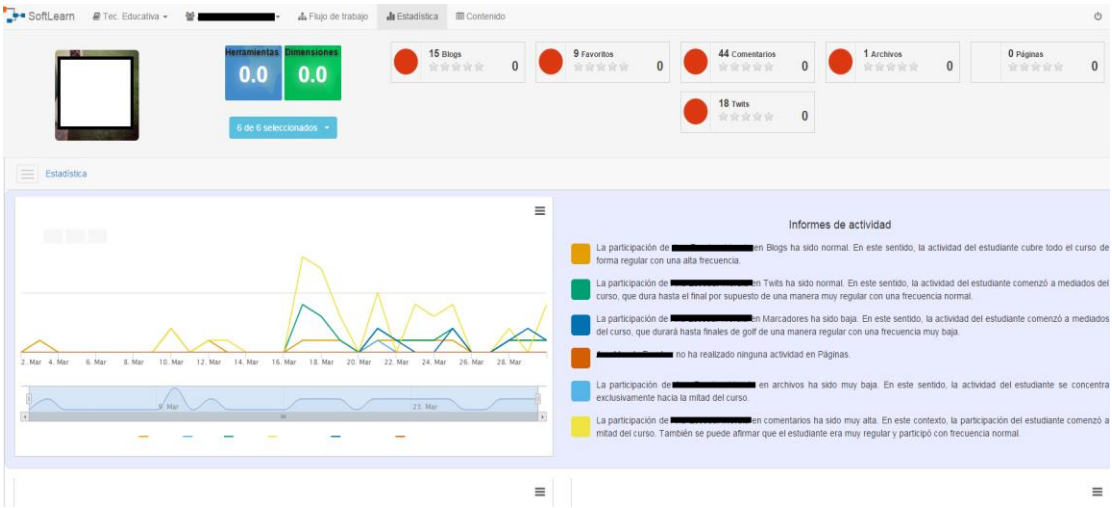


**Figure 1.** Interface tab: Statistics. SoftLearn
Source: Own elaboration

### 5.2. Behaviour by the group or individual in the social network

Throughout the research we have done over the years using social network analysis techniques (SNA) in different courses and subjects, there has always been greater density and less centralization in the network as the course progressed. In other words, the bulk of interactions are not concentrated in a few nodes, but are instead distributed among many students, which confirms that the teaching proposal achieves its goal of integrating students into the dynamics of the subject. Network graphs have also shown that although some students were at the margins at the beginning of the course, the teaching proposal pushed them slowly toward the

centre (as can be seen in Image 2 and 3 corresponding to one of the cases). This context also showed the teacher's role. With a teaching proposal that encourages independent and collaborative work, the teacher recedes from the core to stay at the margins and allow interaction (Gewerc, Montero & Lama, 2014). A positive correlation has also been observed between interactions and marks (Rodríguez-Groba & Gewerc, 2014). An interpretive hypothesis of this is that people who are more involved and engaged in academic work may also interact more and obtain better results.

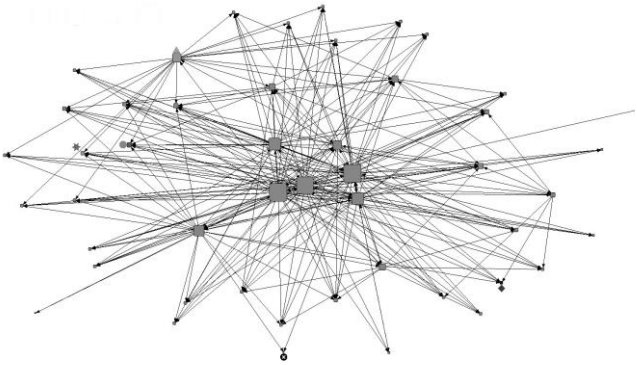

**Figure 2.** Week 10. Subject: Educational Technology Course 2014-2015
Source: Own elaboration

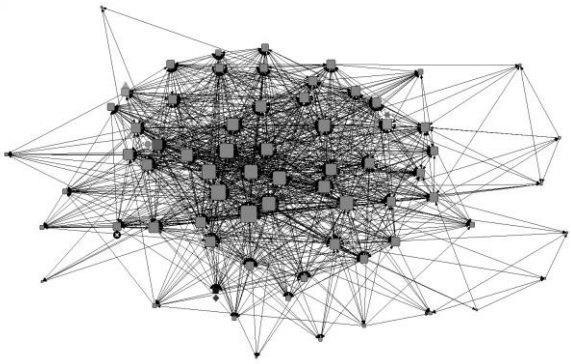

**Figure 3:** Week 16. Subject: Educational Technology **.** Course 2014-2015
Source: Own elaboration

### 5.3. Student motivation

Motivation is a basic aspect of self-regulation (Pintrich, 2000), and it is one of the key ingredients of student work in virtual spaces. Research has revealed that when students are more motivated, there is a greater tendency to socialize, share and interact. The more aware students are of the social dimension and its potential, the greater their intrinsic motivation and the more publications they share with peers (Rodríguez-Groba & Gewerc, 2014).

Data obtained from applying the MSLQ Motivated Strategies for Learning Questionnaire by Pintrich (1989) and its relation with student interaction graphs highlighted the importance of self-regulation skills when working in a virtual space with an open-ended learning proposal. At the outset, students with lower skill scores assume positions at the margins of the graph, but as weeks go by they gravitate toward the centre driven by the dynamics of the subject (Image 4 and 5). Those with higher skill scores are positioned in the centre from the start. In this experience, students were faced with social learning situations involving collaborative activities and spaces for interaction that require different motivational, cognitive and socio-emotional skills from those needed in highly structured learning situations (Winnes & Perry, 2000). Self-regulated learning takes on another meaning when moulded by the context and the relationship with others. Thus, it is more of a co-regulation or shared regulation in certain cases (Fiona, Järvelä & Miller, 2011).

In addition, the use of a social network as an academic space with a formal evaluation based on the portfolios constructed within it has an impact on behaviour and the work carried out. Evaluation cuts across –directly or indirectly– everything that happens there. Thus, the processual mid-term evaluation, which provides feedback on student processes, affects the way students deal with work in the social network. In many cases this leads to enhanced intrinsic motivation, while in others it may lead to discouragement, quitting the subject or seeking extrinsic motivation.

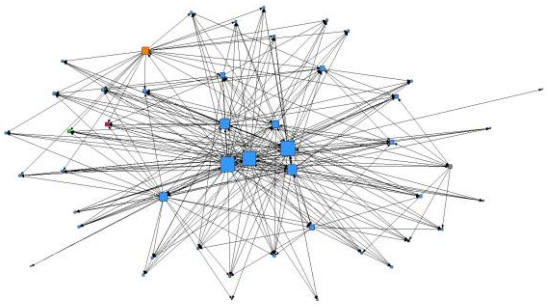

**Figure 4.** Week 3. Subject: Educational Technology . Course 2013-2014. Five students with low MSLQ scores (shown in different colors) and their evolution in the network.
Source: Own elaboration

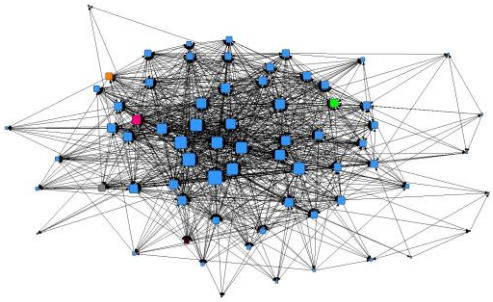

**Figure 5:** Week 16. Subject: Educational Technology. Course 2013-2014. Five students with low MSLQ scores (shown in different colors) and their evolution in the network
Source: Own elaboration

## 6. Conclusions

It is difficult to discuss findings for an on-going project and to describe the experience of many years in a few pages. As we have seen, the teaching project using e-portfolios in a social network has involved numerous challenges. The environment has an influence on the type of work done and also mediates processes. Social networking codes are so well known by students that participation structures are generated that would be unimaginable in other spaces. The first challenge for teachers is assuming the implications of giving a voice to students with all the consequences of participation in a horizontal virtual community. The challenge for students is being responsible for their own learning process, making decisions and taking the lead in their academic training. This puts into play not only self-regulation skills, but socio and co-regulation skills as well. All this is done both collaboratively and individually in a space where work is shared and visible, and where comparison involves shaping views and making adjustments at an individual level.

The research findings reveal how the teacher's role changes and students become empowered and more central to the network as the course progresses (Cho, Gay, Davidson & Ingraffea, 2007; De-Jorge-Moreno, 2012).

In the subjects being studied, the student autonomy proposed offers great opportunities for various types of regulation (co, socio and self) (Fiona, Järvelä & Miller, 2011). The contents are open-ended, and although there is a defined line to follow, the margins are flexible enough to allow students participation beyond the classroom, producing interaction between informal and formal contexts. There are also relations between student motivation, work in the social network, and level and type of relationships established. Therefore, we could interpret that they are mutually supportive and that the community created can help support its members in the process.

We would also like to point out the opportunities provided by the use of Learning Analytics Techniques, which provide valuable information for decision-making. The tracks that students leave on the network reveal their path, work sequence and the type of comments and contributions to peers. Furthermore, the tool created, SoftLearn, helps organize information to facilitate and complement teachers' work.

In short, the answers found during the research process are neither single nor closed-ended, new questions and challenges always arise on the journey of continuous feedback between teaching and research.

We encourage readers of this article to use these spaces and teaching proposals so as to obtain feedback from other voices and views.

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