

Innovation, Knowledge and Sustainability with PLEs: an Empirical Analysis from SAPO Campus Schools Pilots

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Abstract

SAPO Campus Schools (SCS), a project developed by the University of Aveiro and SAPO within the Labs SAPO R&D facility, is a Web 2.0 services platform designed for schools (K1 through K12). Based on an empirical study of use cases of the platform, this paper analyses preliminary data gathered from a group of pilot schools that have institutionally adopted SCS. Building on the concept of BA (Nonaka & Takeuchi, 1995), which relates to the engagement of people interacting in a given space in order to create knowledge, and in the assumption that SCS can become a school's BA and promote disruptive innovation, our main goal is to understand if and how these dimensions intersect in the use cases and whether the changes already noticed in schools will be sustainable on the long run.

Introduction

Sapo Campus Schools (SCS), a project developed by the University of Aveiro, SAPO and TMN within the Labs SAPO R&D facility, is a Web 2.0 platform specifically designed for schools (K1 through K12) that results from the reinvention of another, similar, platform designed for Higher Education (Santos & Pedro, 2009). In September 2012, a group of pilot schools was chosen to sign a protocol making a commitment to promote the formal and institutional adoption and use of SCS. The signing of this protocol assured the participation of the different schools in this research project, making it easier to get feedback from users in a real setting. This feedback also allowed the developer team to uncover flaws in the system and to get real and almost live input on how to improve the services provided. On the other hand, these schools were also faced with the challenge of opening themselves, by promoting and encouraging openness, collaboration, content production and sharing. Because SCS

makes it possible to create and manage personal learning spaces from an individual perspective (teacher/student/other users), it was also important to discuss the concept of Personal Learning Environments (PLE) within each institution.

This particular research project attempts to verify if this process can become a catalyst for disruptive innovation (Christensen et al., 2008) and the creation of spaces where new knowledge can emerge in schools – BA (Nonaka & Takeuchi, 1995). In the following sections we will revisit these concepts, making way for the analysis of specific use cases that are currently under way in SCS. After that, we will discuss the methodological strategies behind this empirical analysis, the cases themselves and will put forward some final remarks.

Background

Schools can become advocates for knowledge management through the creation of institutional learning spaces, where everyone can share, create and display knowledge. Drucker (2002), for instance, refers to the creation of knowledge as an innovation source that has undergone change. Pais et al. (2012) summarize the different types of innovation presented by Christensen et al. (2008) by stating that

“(...) sustainable innovation is about making something better and disruptive innovation is about making something new”.

Pais et al., 2012, p. 5

Hargreaves (cit. in Ferrari et al., 2009) points out that the idea behind disruptive innovation is the opposite of that of sustainable innovation. Figueiredo (2009) doesn't share this vision as he states that despite the high level of failure associated with sustainable innovation in education, this path can be explored. However,

“[t]he promising path to innovation in education systems is through disruptive innovation that quietly grows in the margins of the system, unobtrusively until starts changing it, irreversibly”

Figueiredo, 2009, p. 29

We argue that SCS could be a vehicle for this innovation combined with institutionalization. Miles (1998) presents institutionalization as a change to be taken as normal, as something that is part of organizational life; and that has unquestionable resources of time, personnel and money available. The apparent paradox in the SCS conception - institutional versus personal dichotomy - may actually be another catalyst for change. Considering knowledge creation and the role it plays in promoting innovation, SCS can actually support this space: BA. As stated by Pais et al. (2012, p. 15):

“BA is characterized by the involvement of people interacting in a given space, what sets it apart from ordinary human interaction, the main difference relying on the goal of these meetings: BA aims at creating knowledge.”

SCS can, therefore, be an optimal space for schools that create and share knowledge, the kind of schools that Cheng & Chen (2008, p. 383) consider to be “the cradles of innovative knowledge, [that] have a rich collection of intangible assets”.

SCS anatomy

SCS’s design was based on a set of principles that had a direct impact on usage and user interaction. Openness, one of those fundamental features, involves two different kinds of issues. Because we are dealing with minors (students) that interact within a digital environment, the platform must be safe and in compliance with legal and regulatory requirements. Hence, all content published by users of a given school can only be accessed

by other members of the same school, which includes not only other students, but also teachers, parents, guardians and other stakeholders, all previously validated by the platform's institutional administrators. Inside SCS, all published content is visible to all members of the community, thereby achieving the digital metaphor of the school space. Another consequence of this openness is having a horizontal rather than a hierarchical outlook and structure. Within SCS all users have the same permissions, even though they can play different roles while performing different activities. This choice means that the community must have self-regulation mechanisms, with schools playing a key role in promoting digital citizenship and education. Another fundamental principle underlying the design of SCS is sharing, with a wide range of services being made available to users, making it possible for them to store, organize and share resources in different formats. The creation of blogs is not controlled or subject to institutional permission: any logged-in user can create all the blogs he wants and invite others to manage them. The same applies for photos, videos and the recently integrated file sharing service. Users can also create groups (open or closed; public or private) and make them available to the community.

The principle of personalisation is attained by the creation of a Personal Learning Environment (PLE). This personal and non-transferable dimension suggested by Westenbrugge (Kompen, et al., 2009, p. 34), makes it possible for users to construct their own PLE. Another key feature of SCE is institutionalization, in the way schools must make a commitment to promote the formal and institutional adoption and use of SCS. The combination of these two principles (institutionalization and personalization) was carefully thought out in order to “ensure to the educational agents the possibility of building and customizing their own PLE based on commonly-used Web 2.0 services, while simultaneously

not restricting the range of potential learning activities that can be carried out in a diverse environment as the educational context” (Pedro et al., 2012, p. 3).

Methodology

The processes of adopting technology can be very complex and challenging, especially when they involve significant procedural changes. Even though the introduction of SCS on itself does not imply change, the way it is used by different agents in different school settings can be highly disruptive. Therefore, despite all the institutional support and commitment, and as seen from previous experiences and projects, full implementation and adoption can be very difficult.

The use cases of SCS being presented in this paper result from a pilot study group that benefitted from certified training workshops supervised by the University of Aveiro. These workshops were strategically thought out not only to promote the institutional adoption and appropriation of SCS, but also to facilitate and promote the creation of PLEs at an early stage of their development. These workshops took place between November 2012 and April 2013 and consisted of a total 30 hours of work (15 in attendance and 15 at a distance). After introducing some basic concepts and discussing the philosophy behind Web 2.0 and how it relates to teaching and learning dynamics, the participants had the opportunity to explore SCS and were challenged to develop and execute an educational project that involved the platform. These workshops became very important in promoting and supporting the appropriation of SCS, not only from a more technical perspective, but also and foremost because they allowed people to share and discuss their on-going progress, questions and problems in a constructive way. Based on this sharing and on the opinion of the users, participants often realigned their initial projects, gradually feeling more comfortable using SCS and understanding its underlying principles.

From the group of pilot schools, three were chosen for this analysis. Even though these schools (hereafter referred to as school A, school B and school C) are geographically close (within a 50 km radius), they are very different from each other. School A is located in a fishing village and has 378 students (ages 3 to 15) and around 40 teachers. School B is located in a rural setting. It is attended by 2606 students (ages 3 to 18) and has 241 teachers. It is a cluster school made up of 10 different establishments, 8 of which are geographically scattered. School C is located in an urban and industrialized area and is a junior/high school attended by students from the 7th to the 12th grade. It is a former industrial school known for its use of technology with 971 students and 134 teachers.

As described previously, all schools had to sign a protocol and were institutionally and formally bound to the project, also having access to specific training and support. Nevertheless, because of the different settings and features, the adoption and use of SCS was very diverse. The perceptions and feedback gathered both online and throughout the onsite training sessions made it clear that, even though schools officials have initially been very welcoming and receptive of the project, they adopted different strategies that influenced and constrained the way SCS was used by teachers and/or students. These perceptions are supported by the statistical data gathered from the platform.

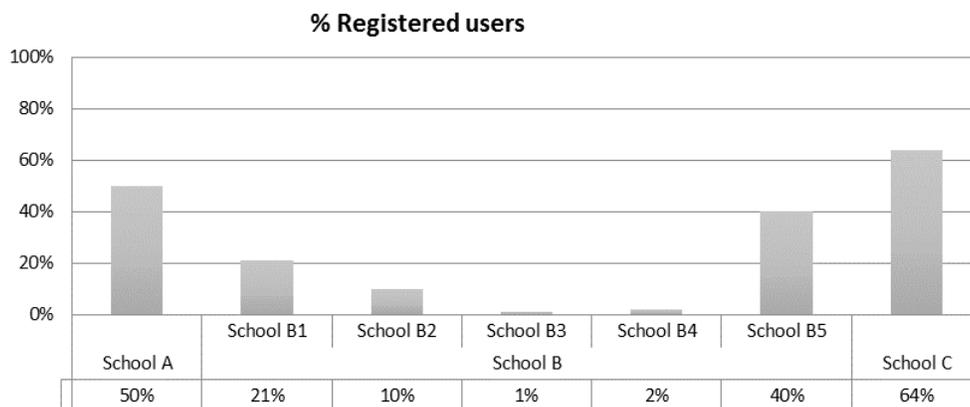


Figure 1. Percentage of registered users

In order to analyse Figure 1 you have to keep in mind the specific features of each school. Students attending school A are between 3 and 15 years old. The percentage of registered users refers to the total number of students, including those who are too young to use the platform by themselves. School B is a very particular case. As mentioned before, this is a cluster school made up of 10 different establishments, being that only 5 of those schools have registered users. While school B1 is attended by 13 to 18 year students, students in B2 are between 10 and 12. B3 and B4 are nursery/preschools (ages 3 to 5) and B5 is a primary school (ages 6 to 9). With overall older students (ages 13 to 18), in school C all students are autonomous and could register themselves in the SCS platform. Drawing from this analysis, schools A, B5 and C are arguably those that stand out.

Even though the number of users can be considered an objective source of data, it is important to complement this analysis with the activity reports of each school. In order to get a more complete and comprehensive analysis, a user activity rate was defined. This rate was based on the ratio between the number of registered users and the activity in each school (number of comments, states, photos, videos, links and posts). The results can be seen in the chart below:

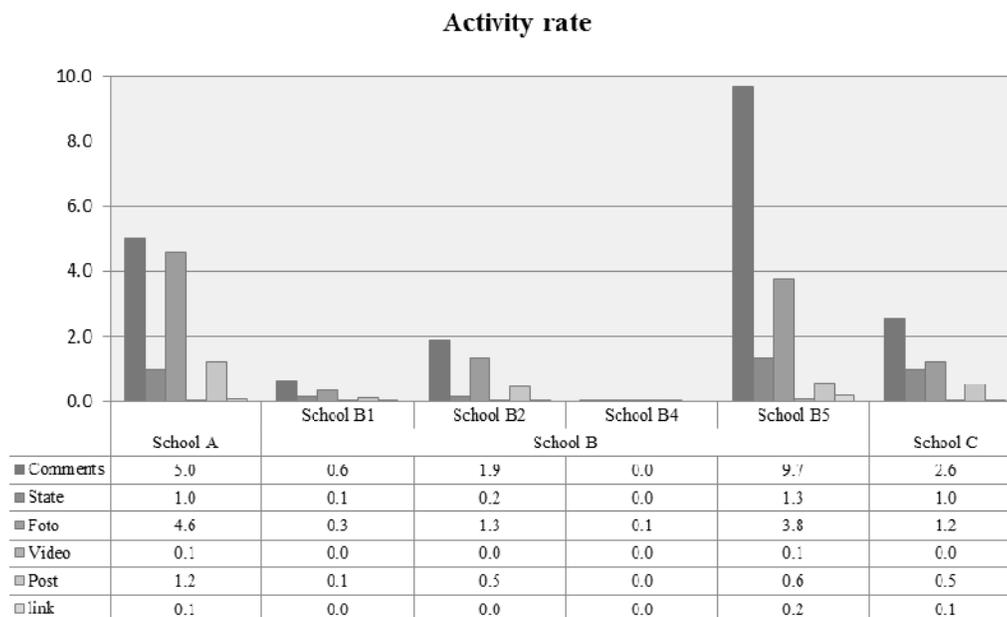


Figure 2. Activity Rate

In the following analysis, School B4 will be left out because there was no activity other than the registration. Chart 2 confirms the idea that schools A, B5 and C are those in which there are more registered users and that are globally more active. However, as we can see from the results in school B5, there is no direct correlation between the number of registered users and each school's activity. Even though it has the lowest number of registered users of the 3, school B5 is the one with the highest activity rate.

After defining and validating the choice of schools to be analysed, it was important to select specific use cases within these schools. These cases were selected based on different criteria that included creativity in the use of the platform, the impact on student engagement and content creation. Because these projects were publically presented and discussed as part of the training workshops, in addition to the data from the platform itself, this analysis also considers interviews with school administrators and the input of the teachers involved.

In school A, the project selected – “AEC (Curriculum Enrichment Activities) for all” – clearly illustrates the potential and the impact that SCS can have in younger audiences. Working with 6 to 9 year old students, the teachers involved in the project created a blog and different groups in which all students could post information, photos or videos regarding not only classroom or school activities, but also other content they found relevant. The different spaces were also used for collaborative projects and to promote contests that involved the school community. Besides being very engaging and involving a great number of students, this project also prompted other teachers to develop their own ventures within SCS. The fact that it played a significant role supporting other initiatives is widely recognized and was pointed out by the school’s administrator in an interview.

The “GeoSapo” project from school B was also selected because of its impact. A more personal endeavour, it involved a group of motivated teachers that created an engaging project that appealed to other teachers and even other schools. At a first stage, the project aimed at publicizing a wide range of activities that promoted the local geopark, but it quickly evolved into something more dynamic, taking full advantage of Web 2.0 features. This project was at the core of a process that can lead to disruptive innovation.

In school C we have selected 2 cases to analyse: “Weekend Discussions” and “The 3R Club”. The first example was selected because of its diversity and levels of participation. Unlike the previous cases, it has a very different background and goals, with SCS being used to support discussions on topics that aren’t usually discussed in the classroom. After a process of negotiation, the teacher and the students agreed that every Friday, a student would have to suggest a topic to be discussed synchronically the following Sunday, from 7:00 to 8:00 p.m. As for the second project – “the 3R club” – it didn’t have a predefined audience, supporting an already existing recycling group that was open to all students. Because it was the first time

the teacher responsible for the project worked with social networking services, there were some initial reservations. But, despite the initial scepticism, SCS became a cohesive agent, with a high level of engagement, with more and more challenges being posted every week.

Nevertheless, it is also important to mention that not all projects developed within the platform succeeded in promoting participation and engagement. In some cases, like in school C, at least one project had virtually no interaction. One thing that emerges consistently in all schools involved is the personal dimension that embodies the concept of PLE and can be easily found in the examples described. Using SCS, teachers and/or students create and regularly update blogs about their own personal interests and share photos, videos and links, also commenting and interacting in different ways.

Throughout the following sections of this paper we will examine these cases more comprehensively, systematically revisiting their unique and differentiating features, as well as common and constant elements that make up the processes and may be the drivers for disruptive innovation. Setting out to describe some examples of how a Web 2.0 platform is being used in different schools and relating that with innovation and knowledge creation processes, this study does not intend to thoroughly analyse each particular case, but rather draw a broader picture, exploring possibilities that have already been noticed.

Use Cases

Project “AEC for all” (School A)

Recently, trying to meet families’ needs by adjusting schools schedules, the Portuguese government created the Curriculum Enrichment Activities (AEC), a funded program that aims at broadening the primary school curriculum and ensure a full day education. Arguing that schools should offer more than just curricular activities and that they should promote physical education, sports, arts, technology, scientific inquiry and foreign

languages education, the Ministry of Education developed a regulatory framework to ensure that after their regular classes, children can stay at school and engage in pedagogically enriched activities.

At school A students can take part in Study Room, English as a Foreign Language, Sports, Arts and Story Time. Even though they are not compulsory, most students are enrolled in these activities. Considering only those attending English and Arts classes and whose teachers took part in the training workshop, this particular use case involved a total of 112 students. When asked to come up with a project that combined features of Web 2.0 and SCS and that was within the scope of the AEC, the teachers involved tried to create an articulated and interactive space, where all participants could share authorship and publish content. To be accessed outside the classroom, this space would be used to showcase the work being done in the different activities. Using a blog, participants should regularly post texts, pictures and videos displaying their work, so that other members of the community could comment on it. This blog was created and then shown to the students. In order to showcase the features of the platform and make it easier for students to register, a demo-user for each class was created. The first interactions within the SCE took place using these demo-users in the classroom, as students started to register themselves.

After this approach and due to difficulties in the registration process, the teachers involved asked for parents' permission to register the students in the platform. At the time of this analysis, 58 students were registered in SCS and listed as blog authors. Of those 58, 51 took active part in the blog either by publishing post or comments.

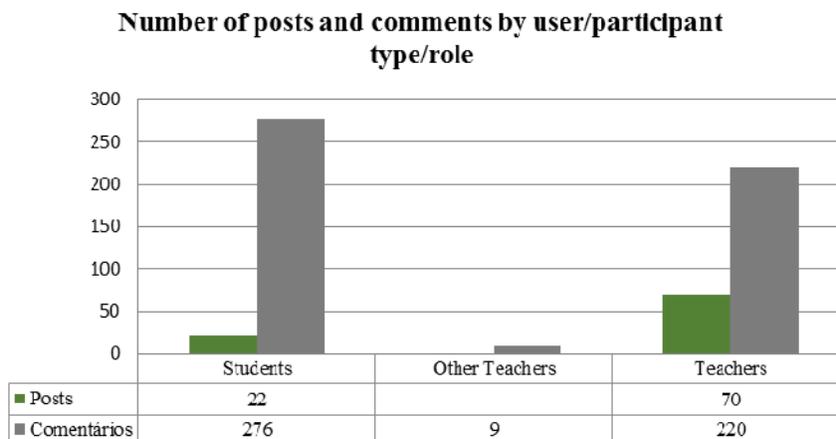


Figure 3. Activity distributed by participant/user type/role

As can be seen in Figure 3, in the time frame analysed, 92 posts and 505 comments were published. Because it is a blog open to the community, there are some comments that were made by other teachers and students who are not directly involved in the AEC project.

Overall, and even though most content was published by the teachers, students were very active in commenting. In fact, as it can be seen in figure 4, there was a steady increase in student participation. This can indicate a growing familiarity with the platform, with students feeling more confident to interact as they become more autonomous. In addition to this, student activity tends to mirror teacher activity, repeating its pattern.

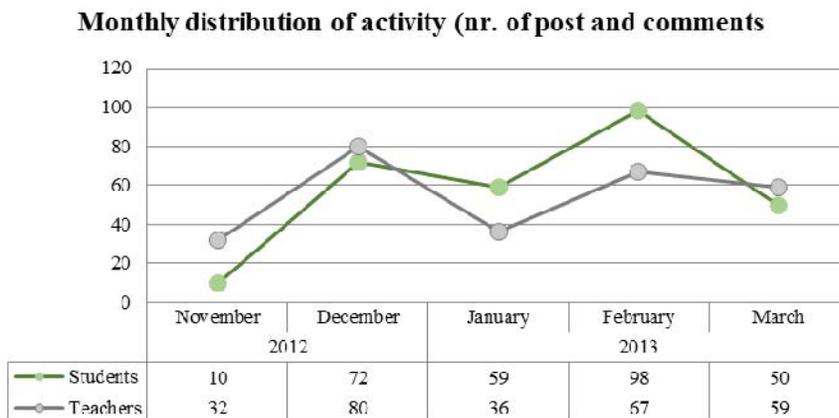


Figure 4. Activity - monthly distribution

If you analyse the blog's activity more closely, you can also observe that activity peaks in the blog are concurrent with specific school events, such as the school's Christmas party or the celebration of Valentine's day. In that way the activity timeline in the platform seems to replicate the school calendar and activities, with user participation decreasing significantly in school holidays.

In Figure 5 you have an example of students' activity. Following a collaborative writing task in the classroom, students went online and published a Valentine's Day Poem. This post was commented on by other students and also by teachers. Soon after this post, students from other classes also posted their own poems on SCE.

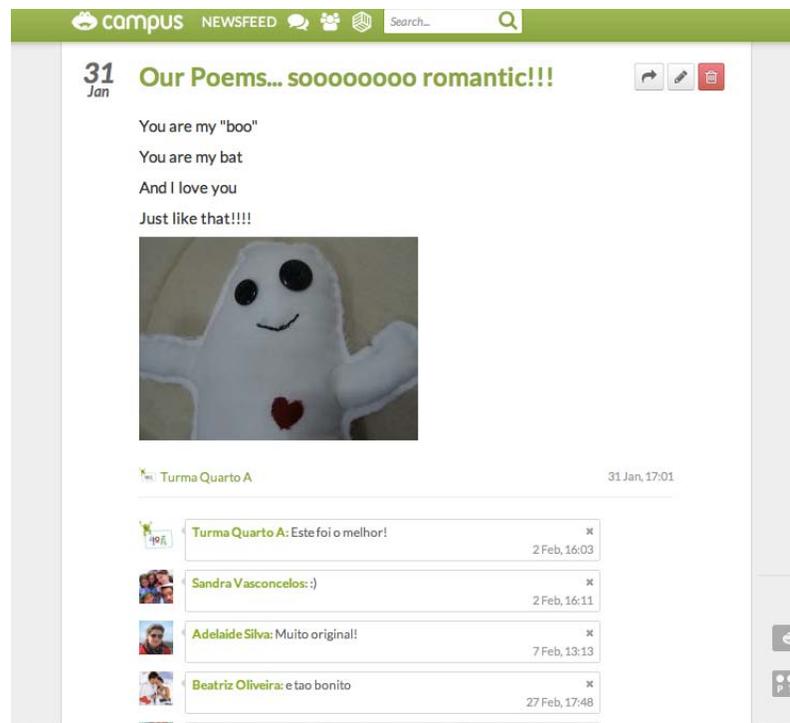


Figure 5. Student activity

Even though some of the activities were carried during classes, most students interactions took place outside the classroom, after school hours or during study breaks (between 10:00 and 10:30 am and 3:00 and 3:30 p.m).

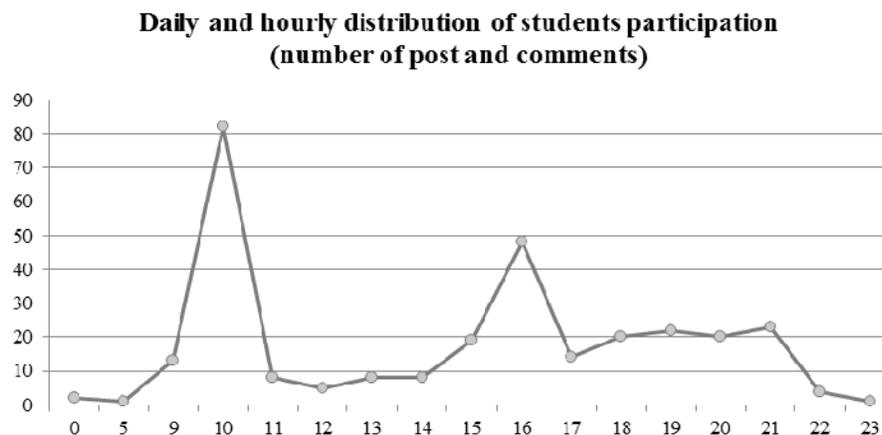


Figure 6. Student participation: daily distribution

An empirical analysis of the number of posts and comments also suggests that this blog evolved from being a display of the work being done by the students to become a sharing, collaborative and socialization space, combining formal and informal learning and interaction. In addition to publishing information related to content presented in class, such as a song or the life and work of a given artist, it was possible to identify some of the students' interest areas and problems, which were later addressed in other settings. When a link to a game was made available, for example, students were asked to post their scores in English, making it possible for one of the teachers to pinpoint a few common mistakes. At another time, after reading some confusing comments about an Albert Einstein cartoon, another teacher took the opportunity to carry out a research assignment about prominent scientific personalities.

The blog was also used to answer questions about the platform and troubleshooting. Many of these comments dealt with space personalization, with students asking how they could change their profile photo, and with publishing content ("How do I publish a video?", "Can you help me post a photo?", "I forgot how to publish a video."). Even though some of these problems were recurring at first, they became less noticeable as students became more

independent accessing the platform. It should also be noted the role played by older and more autonomous students in answering less-experienced users questions and helping them register and taking part in the community.

The data gathered suggests that users were very enthusiastic in participating and interacting with each other and with the content published. However, mostly due to the age of the users, participation was disorganized and at times chaotic, making it impossible to categorize the type of comments and find content patterns. Many students published content and asked questions outside the blog and tried to address specific people rather than focus on space. Students' comments also suggest that they were interested in synchronous communication with other users, often using comments and posts to chat. Another indication of the users' lack of experience was the fact that, when trying to comment on something, they would report the content as inappropriate. This could signal that it would be important to have other ways of interacting with content that didn't imply writing comments.

GeoSAPO (School B5)

Located in rural setting and near a geological park, school B5 is a recently remodeled school with a strong connection to the surrounding environment. Each classroom, for example, is named after a geological element that can be found in the near geological park (as the "trilobite room"). In addition to these more symbolic features, and because nature and ecology are a very important part of the curriculum, the school has also developed many projects in this area, the most recent being the "Earth Experiences" program. The project GeoSAPO aims to extend the scope of this program and "developing multidisciplinary activities that promote the Geopark". Five teachers of this school decided to use SCS to support and publicize their work. Even though it was the first time they worked with web 2.0 platforms, working closely together as a team, the teachers involved managed to overcome

the different obstacles they faced. The first problem relied on the registration process. Due to the age and lack of experience of their students, they had to create email addresses and register them. This process required getting parental consent and working with the families, making them aware of this opportunity of working together with their children and allowing them to actively engage in their learning. In addition to the registration, teachers also had to be creative in order to keep the younger children from forgetting their logins and passwords. They designed a personal and non-transferable card with each user’s information and monitored their activity very closely.

With many registered users working on it, the project became a big hit. In order to address curricular questions, different spaces were created within SCS, with the different classes taking part and participating keenly. That massive participation is demonstrated in the chart below:

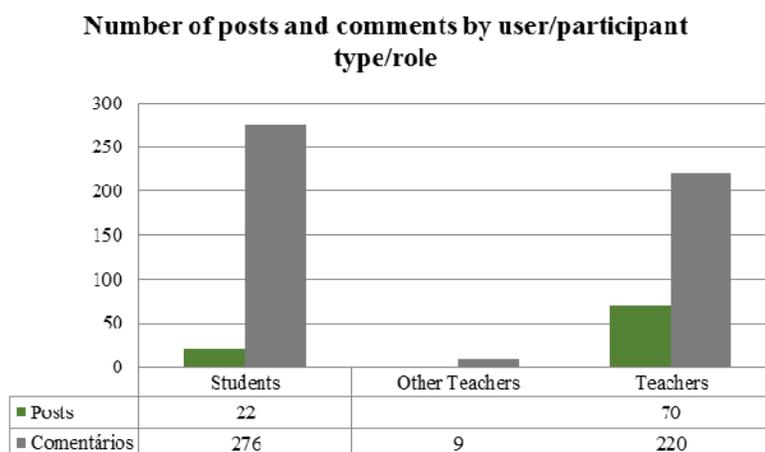


Figure 7. Activity distributed by participant/user type/role

This chart confirms what was said previously in the methodology section: school B5 has the highest activity rate of all the schools considered in this study, with students not only reacting (number of comments) but also producing content (number of student posts).

Moving beyond the initial project, many students also spontaneously created blogs and posted their own content, as can be seen in the following examples:

- Fun PEB09 – a place where all the PEB09 (the author’s classmates) can laugh
A 4th grade student created a blog where he could post jokes. This is an interesting example because the author asked his classmates to join him, so they would not only react to what was being written, but also post their own jokes and funny stories.
- Infinite Music
A third grade student who was passionate about music and the transverse flute, created a blog where she would post videos, photos and texts on this topic.

The chart above also gives us important data regarding teacher participation. As you can see, there is a significant number of comments from teachers who are not involved in the project. As we mentioned before, school B is a cluster school made up of 10 different establishments, being that all of them can access content being published by the different schools. Many of the comments from other teachers, are also from different schools. This dynamic gave way to the collaboration between schools, with school B5 positively influencing and driving other teachers and students to develop their own projects. This was a two-way influence and collaboration, as users from other schools would often interact with users from school B5.

As for GeoSAPO, in order to support the project, teachers at school B5 created a “GeoSAPO time”. Every Wednesday morning, students taking part in the project would meet in the school library to share what they had learnt throughout the week, ask questions about SCS and prepare competitions and challenges. Because it was difficult for some younger

students to keep up with all the activities, older students would often monitor and help them. These meetings went viral, with other students becoming curious and eager to take part in the project. Another distinctive feature of this project is the fact that it involved people outside the school. As mentioned before, parents were key players in adopting and using the platform, as it supported their involvement in their children's school activities. This evidence is also supported by the following chart:

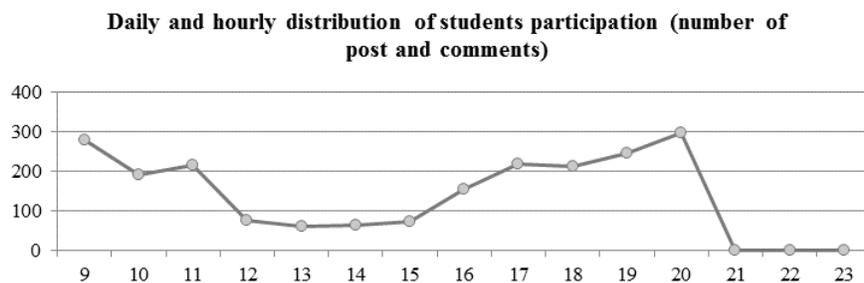


Figure 8. Student participation: daily distribution

Most activity in SCS took place after 5 p.m., i.e. outside school hours. Even though the time alone is not enough to determine parental participation, there are other indicators that support this assumption:

- Most students that log-in after 5 p.m. are 3 to 5 years old and do not know how to read and write;
- Some posts are co-signed by parents, showing their support in using the platform;

Throughout the whole process it is also important to mention the interaction strategies adopted by the teachers involved, who would readily answered all their students' questions and stimulated them. They also developed an informal user policy and promoted online safety. According to them, this was SCS' most significant benefit: the fact that it made it possible for them to showcase their work in a safe environment within the school community.

The 3R club (School C)

In Portugal there is a national programme that encourages the collection and recycling of plastic bottle caps, with several companies exchanging them for orthopaedic material.

Carrying on the work of previous years, the 3R (Reduce, Reuse, Recycle) club from school C is involved in this campaign and aims at raising people's awareness for this movement.

Working closely with local authorities and CERCI (a centre for the rehabilitation and integration of people with disabilities) the club is always reaching out to the community and trying to find new active members.

When asked to come up with a project involving her students, Web 2.0 services and SCS one of the teachers responsible for the club, together with a group of 9th grade students, outlined a plan of action that included:

- *The creation of the "3R Club Blog" where different events could be publicized.*
- *Researching and posting creative projects that used recyclable and reusable materials;*
- *Advertising collection points throughout the school;*
- *The creation of a group in SCS where participants could work together in order to design two bottle caps collection containers. All caps collected should then be recycled, with the funds raised proceeding to the local CERCI.*

In the following chart we can see the number of posts and comments on the blog, according to the type of user.

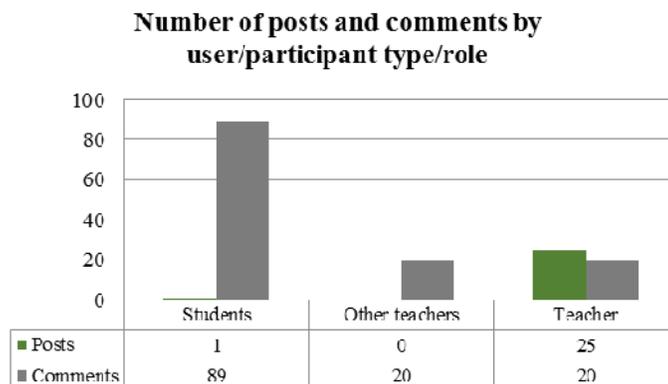


Figure 9. Activity distributed by participant/user type/role

Even though, when compared to others, this blog did not have a significant number of contributions, there are some distinctive features that should be taken into account and are relevant for this analysis. On the one hand, it was a new experience for all those involved, being that the teacher responsible for the blog had never worked with Web 2.0 services before. Nevertheless, she prompted student participation, asking them for comments, posting challenges and even giving out rewards. In one of these challenges, the teacher posted a picture of a container somewhere in the school, asking students to guess where it was:

“Is it a giant candy, a vase? No! It’s a hidden plastic container used to collect plastic caps from those who drink water or yogurts at school. Have you seen it?? Where is it?? Have you ever used it?? I don’t think so. I keep seeing caps in the regular bin. Why don’t we use the recycling bins and put the caps on a separate container???
There will be a sweet award for the first to guess where this cap collector is!!”

Teacher, School C

Student feedback was immediate and the winner was given a chocolate bar. But the most interesting aspect of the project was the fact that, as the different challenges were

issued, many of the discussions extended beyond SCE, taking place in and outside the classroom. According to the teacher in charge, many students that were not involved in the project would question her about the challenges and the results. Because it is a non-curricular project, most interactions took place after classes. In the following chart we can see the daily distribution of student activities (number of posts and comments).

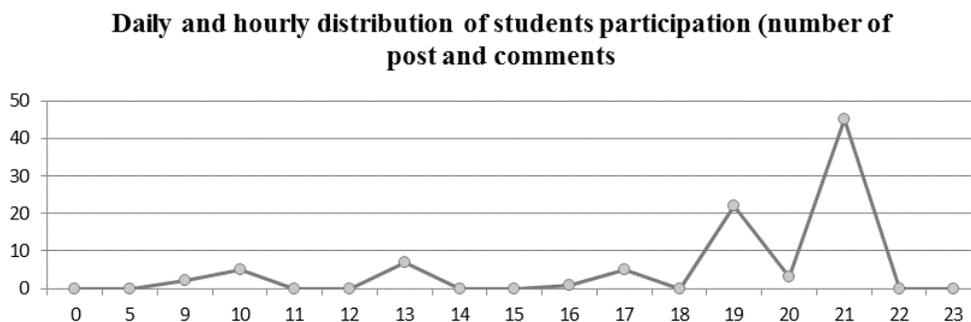


Figure 10. Student participation: daily distribution

In order to publicize the project and the different club activities posted in the blog, the teacher also used the school's mural, regularly reaching out to all members of the community and inviting other students to take part in the project. This was considered to be an effective strategy. Another interesting feature of the project was the fact that many other teachers also engaged in the discussions. This interaction played an important part in keeping students motivated and making the project known.

As mentioned previously, one of the challenges issued involved the creation of two cap collecting containers. Open to the school community, in order to enter the competition participants should publish rough drafts that would then go through a selection process. With the help of teachers and students, two drafts were chosen. Because there were many constraints associated with the actual building process, in one of the training sessions the teacher supervising the project asked for the cooperation of arts teachers and students.

Another teacher attending the workshop offered to help and working collaboratively (both teachers and students) they built the container below (Figure 11):



Figure 11. Container

This container went on to win a municipal award.

You speak, I speak, we speak (school B)

Involving an 11th grade class (students ages 16-17), this project was open to the community and, according to the teacher in charge, aimed at “promoting the use of Web 2.0 as a way of bringing participants closer and developing their critical sense”. Reaching outside the classroom and moving away from formal content, it consists of using SCE to promote a weekly debate with students. Having started in January, every week a different student would post a topic, some context and a few questions on a blog in order to kickoff the discussion. This discussion took place synchronously, using comments on the post. Because it requires participants to be online simultaneously, a meeting time was previously negotiated and agreed upon. Participants agreed to meet every Sunday from 7:00 to 8:00 p.m. Participation was optional and there was no kind of reward or compensation other than taking part in the

discussion and sharing personal thoughts and opinions. The topics discussed were very diverse and can be seen in the following table:

Table 1. *Discussion Themes*

<i>month</i>	<i>Discussion theme</i>
<i>January</i>	Young writers
	Teenage pregnancy
	First Sexual Intercourse
	STD (Sexually transmitted diseases)
<i>February</i>	Media
	Drugs
	Doping and performance enhancing drugs
	Can a teacher be a friend?
<i>March</i>	Domestic Violence
	Homosexuality
<i>April</i>	Sports in Adolescence
	Music festivals
	Precocious Youth
	Young people and social networks

In the period covered in this analysis, 18 students (from a total of 24) took part in the discussions. The following chart illustrates the distribution of activities within of the group:

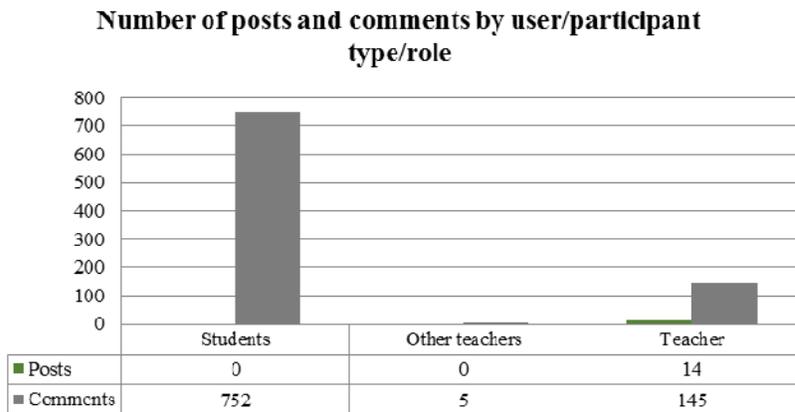


Figure 12. Activity distributed by participant/user type/role

As can be seen in the previous chart, from January to April, there were 14 posts, each for a different topic, generating 752 student comments. An empirical analysis of the comments indicates that the teacher took on the role of mediator, moderating the discussion: the students played the most active role. The following chart details the distribution of the blog activity throughout the time considered in this analysis:

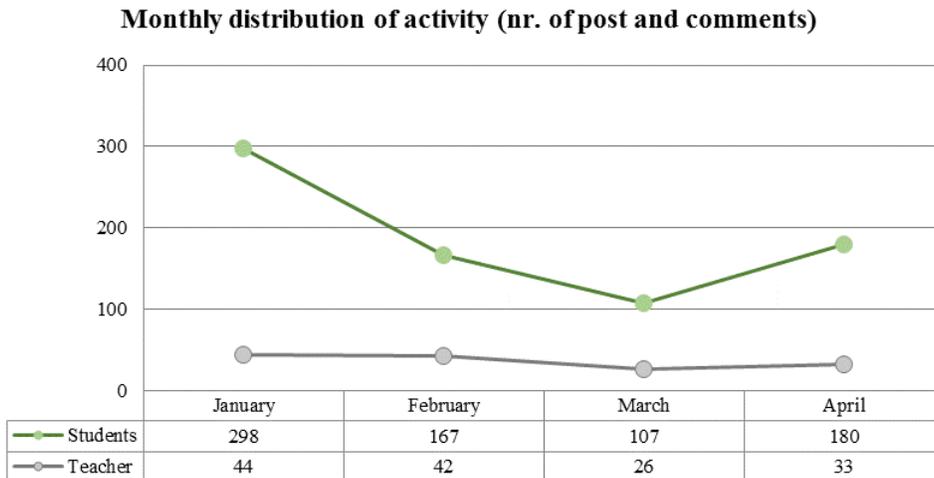


Figure 13. Activity - monthly distribution

The graph shows that after a very promising beginning, the blog activity decreased and became more stable. Much like in other cases described before, in March, in the weeks

corresponding to the Easter holidays, there is a further decline in the number of interventions. If we overlap the data from the graph with the topics covered in the discussions, in January all but one dealt with sexuality. These topics appeal to the target audience and seem to arise their curiosity. If you go through the comments, you can see there are still many myths and misconceptions surrounding these matters. In addition to the sensitivity and the intimate nature of these particular subjects, the fact that the debate was public had an impact in the discussions. When discussing and commenting on this project, other teachers referred that they followed the blog and the interactions but didn't feel comfortable enough to engage in the discussions, given their personal nature.

Even though the students taking part in the debates belonged to the same class and had know each other for at least two years, after the first discussion many revealed other sides of their personalities. In the first discussion, for example, one of the students shared a passage of poem he wrote. His classmates, who were not aware of his interest in poetry, reacted immediately, expressing their surprise. Students' engagement in the discussions wasn't limited to text. They shared many links related to the topics being discussed, adding to the debate.

Conclusion

The current activity of SCS is not limited to the practices briefly described above. SCS is already a platform where information, knowledge and experiences can be shared and can be considered a quality step forward towards the elimination of hierarchical institutional barriers. To some extent, the use cases described evidence that SCS can help institutions overcome these barriers: teachers and students are at the same level, the only difference between them lying on the setting and the role they play at a given moment. In the schools described it is usual for students to ask questions regarding curricular content. These

questions are answered not only by other students, but also by teachers. Moving beyond independent projects or individual blogs, the schools' digital wall are used to showcase different activities and to discuss all sorts of issues, prompting and adding value to the interactions taking place.

SCS is a Web 2.0 platform based on SAPO core technologies that may promote communication, sharing and collaboration in schools (K1 through 12). It also reveals the built-in dimension of Personal Learning Environments (PLE), making it possible to create and manage personal spaces with all the PLE features, within the institutional whole that makes up a school. The focus on the platform should not, however, be viewed from a technic standpoint that instrumentalises the PLE, but rather from a humanist perspective that values the individual or groups of individuals and their control over their learning activities – both formal and non-formal (Fiedler & Väljataga, 2010). SCS can, therefore, be considered an institutional supported PLE in which the focus is on the schools' commitment as a whole, rather than on isolated initiatives from teachers or students. As we have seen from the uses cases, in SCS, each school establishes its own network, using elements of their community. This option can be seen as a limiting aperture, but is related with privacy issues mostly due to the age of the target audience. This fact was particularly relevant in schools A and B.

Christensen et al. (2008) refers to disruptive innovation not only as something concerned with the improvement of a product (as sustaining innovation) but also with a radical change of paradigm and principles that underlie the product or process. Disruptive processes usually take place in smaller groups, slowly and gradually being adopted by larger groups. Of the cases described, this can be best seen in school B5, where SCS has been the catalyst for change. With an initial small group of active participants, its use has steadily spread to the rest of the school and is already promoting change in practices and procedures.

Angehrn, et al. (2009) identify some characteristics that a platform that supports and sustains innovation process should incorporate:

“Collaboration, knowledge sharing and exchange, reciprocal trust, recognized ownership, reinforcing and enlarging innovation stake-holders’ networks, clear network visualization, simple and reliable technology (...): all these factors need to be taken into account to develop effective IT tools aimed at supporting and boosting innovation processes.”

Angehrn, et al., 2009, p. 207

Even though some of the characteristics mentioned by Angehrn, et al. do not depend on the technological platform itself but rather on use, SCS can be viewed through these lenses in order to verify if it meets the conditions thought necessary for innovation.

Christensen et al. (2010) argue that combining change and innovation, and using technology as a catalyst for a disruptive, student-centered process, can be the key to have a school fitting the values of today’s knowledge society. The same authors also suggest that the personalization of teaching accommodates students’ multiple intelligences, as postulated by Gardner (1993) and can play a pivotal role in this process.

BA can be translated as place and is defined as “a shared space that serves as foundation of knowledge creation” (Nonaka & Konno, 2005, p. 1). Even though there are pieces of evidence that suggest it can become BA, and thus promote disruptive innovation, it is still early to draw definite conclusions. If in fact SCS is becoming part of the school ecosystem, only time will tell if these changes will be sustainable on the long run.

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