USE OF THE CRITICAL INCIDENT SURVEY AS A REFLECTION ON THE TEACHING-LEARNING PROCESS

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Abstract

This teaching experience explores the use of the Critical Incidents Survey, predefined in the Moodle platform, used in the Elective I: Topics of circular economy, of the Civil Industrial Engineering course at the Universidad de Atacama. This practice generates an instance of reflection of the teaching work, with the intention of improving the teaching process to university students. The sample consisted of 60 students in their first year of the course. The intervention was developed in two stages; first, a previous programming of the activities to be developed during the four months of the course was carried out, which, once concluded, would support the use of the virtual forum, so that the student could communicate and build knowledge through interaction with other people and support the construction of knowledge. In a second stage, the impact of these activities on students is evaluated using the critical incident survey. Finally, the results obtained reveal that the use of tools to improve the reflection of students and teachers on everything developed in class can help to focus the effort and recognize the active role of each one of them in their practices.

Keywords: Critical Incident Survey, Forum, Reflection.

Introduction

Technology in education allows a qualitative leap in methodology, providing an environment that allows the development of research and the creation of knowledge to improve the teaching-learning experience. The Universidad de Atacama has institutionalized the use of the Moodle platform, which has some outstanding advantages for incorporating essential resources, such as online content and activities; interactive and transparent evaluation; and fluid teacher-student interaction (Ross, 2008), advantages that make this virtual platform be considered as an instrument that allows the development of transversal skills of students (López & Romero, 2010). All this, because it has tools that allow the socialization of knowledge, and also provide the opportunity to participate in a reflective and collaborative way. This experience is focused on two of them, one of which is the forum, which allows students and teachers to exchange ideas by posting comments related to topics, which encourages a debate. "The asynchronous exercise itself allows students to articulate their ideas and opinions from different sources of discussion, promoting learning through various forms of interaction distributed in different spaces and times" (Tagua de Pepa, 2006, p. 4).

For Fedorov, (2006), the methodological strategy of the virtual forum has a positive impact on the development of different elements of critical thinking. According to Arango, (2003):

"A virtual forum is an Internet communication scenario, where debate, agreement and consensus of ideas are encouraged. It is a tool that allows a user to publish his message at any time, remaining visible so that other users who enter later can read it and reply". (p. 2).

The second corresponds to the predefined Critical Incident (CI) survey, which, when used at the end of the course, allows the evaluation of the teaching process used in the course, because a critical reflection can promote a deeper understanding of teaching (Richards & Lockhart, 1998). A critical incident is an event that occurs at a specific time and place, an event that generates a conflict in the usual strategies used by the teacher to do his or her job. The presence of a critical incident in the classroom, leads the teacher to seek alternatives to try to solve the conflict and regain control of the teaching process, but it is not enough to propose new and diverse strategies, but it is required to reflect on the pedagogical practice that is being carried out, and even requires some review of some aspects of the teacher's professional identity (Monereo, 2010).

Problem to be addressed

Currently, the use of technologies has allowed students to assume a more active and collaborative role, supporting the joint construction of knowledge by those involved, the teacher assumes a function of moderator or support guide different from its

traditional role, for some authors, such as Dominguez (2001) and Garcia et al. (2008). these changes do not happen automatically by the mere incorporation of technology in education and it is necessary to contribute to the transformation with education and training processes that lead students and teachers to assume a change in the traditional functions and the way of transmitting knowledge, promoting interpersonal contacts and eliminating the barriers of space and time.

The objective of this experience is:

Reflect on the critical moments that students remember in order to learn about the activities that are contributing to their teaching-learning process.

Experience

The research was of an experimental, descriptive nature. A non-probabilistic and intentional sample was used, belonging to 60 students of the first year of Industrial Civil Engineering, enrolled in the Elective I subject, called topics of circular economy and sustainable development, of the Faculty of Engineering, at the Universidad de Atacama.

The use of didactics was carried out in 4 months in which the subject was developed, this experience has the objective that the student can develop communication skills and that it can be taken as a means to develop a dynamic, participatory and enriching activity that favors the collaborative process of teaching and learning.

The forum will be used as a complement to give continuity to the activities carried out in the course, favoring the exchange of ideas and the contrast of opinions. The tools used to measure the behavior was the Critical Incident Survey, predefined by the Moodle platform.

The Critical Incident Survey is based on a survey by Stephen Brookfield and consists of asking students to reflect on the critical moments they remember from the course, consisting of 5 questions with free-text answers:

1. At what point in the class were you most engaged as a student?

2. At what point in the class were you most detached as a student?

3. What action by any person in the forums did you find most affirming or helpful?

4. What action by any person in the forums did you find most intriguing or confusing?

5. Which event surprised you the most?

The critical incident survey was applied at the end of the course. The activities to be developed and supported through the use of the forum are distributed in the following way:

Month 1

Activity 1	Forum 1
-Autonomous work Read "Contribution of Civil Engineering to Sustainable Development. Present and future" and the graduate profile of Industrial Civil Engineering of the Universidad de Atacama.	Reflection and opinion regarding your responsibility as a future professional with sustainable development.

Month 2

Activity 2	Forum 2
-Autonomous work Conduct research on sustainable consumption	Reflection on the relationship between sustainable consumption and sustainable development.

Month 3

Activity 3	Forum 3
-Online master class by the teacher, explaining the life cycle of products. -Group work in which students must select an everyday product and graph its life cycle. -Online class exposition of the work by the students.	Reflection on the analysis of the life cycle of the products we usually consume and what we have learned in relation to this topic.

Month 4

Activity 4	Forum 4
-Webinar: Engineering, sustainability and circular economy, the objective of this activity is to provide a space to reflect on how the economic, social and environmental dimensions affect us as a society and how through innovative entrepreneurship, solutions can be sought and found supported by the environment, F4F SpA (Food for the future), a company that transforms organic waste into ingredients of high nutritional value using insects.	Reflection on the concepts learned in the course and how they can be applied in the enterprises.

Data analysis

Once the activities described above are concluded, students are invited to answer the critical incident survey available on the Moodle platform, in order to analyze the five student responses and reflect on them. As they are free-text answers, a similarity of these answers is made in order to group and dimension them. After the collection and analysis of the critical incident survey, a focus group was held with 10 of the students of the subject. The focus group guideline was constituted by the 5 questions of the critical incidents survey and supported by the information collected in the previous instrument, which allowed discovering and deepening aspects related to the answers and assumptions built around the survey at the time they answered.

Results

The Critical Incident Survey

The purpose of this survey is to identify what might have caused students some doubt, surprise, discomfort or concern due to lack of consistency or unexpected results. The following results were obtained:

1. At what moment, during the class, did you feel more involved as a student?

The answers were grouped as follows;

When participating in the forums 17%(A);

In group work 23% (B);

In classes guided by the teacher 50% (C);

At all times 10% (D).

The distribution is as shown in Figure 1, where most of them are more engaged in classes guided by the teacher (C) and in group work. (B).
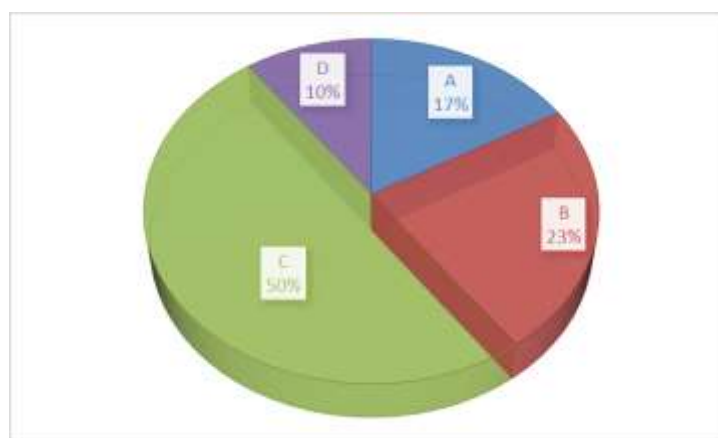

Figure 1. Most involved moments as students

1. At what point during the class did you feel most alienated as a student?

The responses were grouped as follows;

At no time 60% (A);

When the subject matter was repetitive 13% (B);

When the concepts were not understood 20% (C);

Connection problems 7% (D),

Where it was found (Figure 2), that 60% of the students stated that they did not feel distancing as students from the class, followed by those who felt distancing at the moments when there were connection failures.
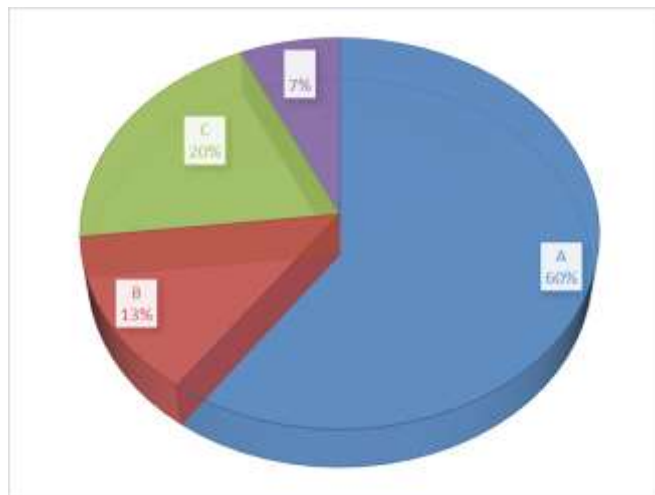

Figure 2. More distant moments as students.

1.   What action, by any of its participants, have you found most useful or positive in the forum?

The responses were grouped as follows;

Getting to know the different opinions and points of view of my peers 48%(A);

Quicker participation in the forum after a group activity 14%(B);

Prior research to participate in forums 14% (C);

None 24% (D).

Where it was found (Figure 3), that most of the students stated that they found the forum more useful to know the different opinions and points of view of their classmates.
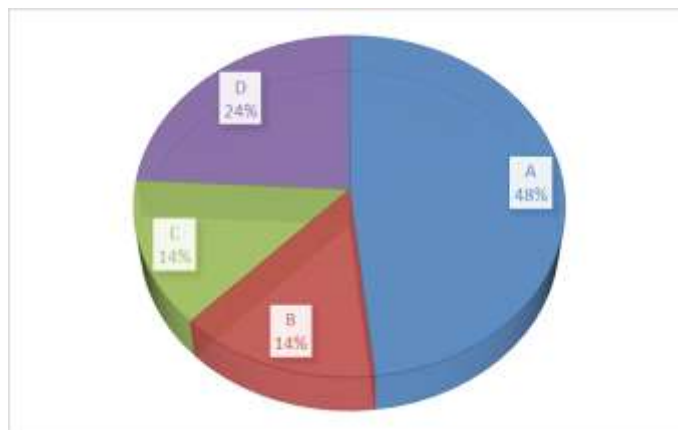

Figure 3. Most useful action in the use of the fórum.

2.   What action within the forum have you found most complex or confusing by any of its participants?

Responses were grouped as follows;

None 41% (A);

Looking for reliable sources 21% (B);

At the beginning of the subject 17% (C);

Extent of participation in the forum 21% (D).

Where it was found (Figure 4) that most of them stated that no action seemed more complex within the forum.
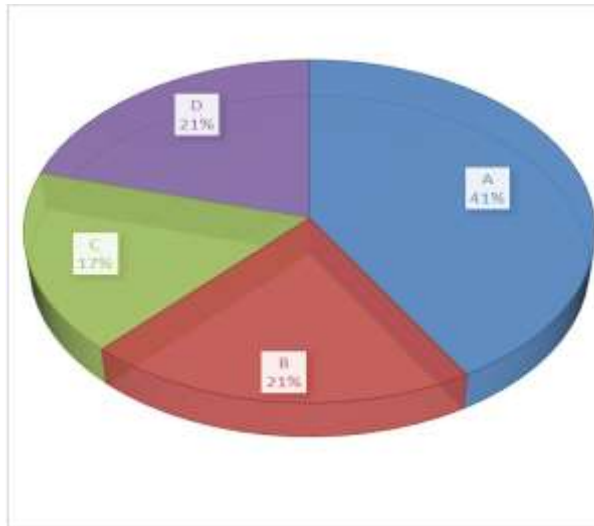

Figure 4. Action within the forum has seemed more complex to him.

3.   Which event surprised you the most?

Responses were grouped as follows;

Dissertations before the forum 40% (A);

Webinar before the forum 23% (B);

Having to reflect before participating in forums 13% (C);

All 17% (D);

None 7% (E).

Where it was found (Figure 5), that most of the students said that they were more surprised by the activities of the dissertation in class.
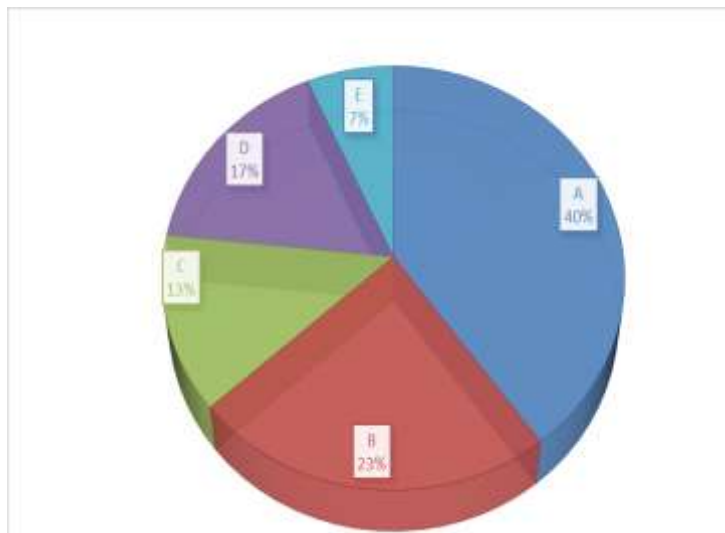

Figure 5. Events that have surprised you the most.

Focus group analysis

- The students attributed that their participation in the course was mediated by factors such as:
- - The fact that the students did not know each other, which caused communication problems at the beginning of the course; however, this was solved as they carried out group work with rotation of the members of the group.
- - The mastery of virtual environments, which they had to learn to use unexpectedly and quickly as the course progressed.
- - Access to the Internet, sometimes they had connectivity problems.
- - The impact of the contents according to the interest and activities designed for the student.

Conclusions

In the present experience, it was possible to notice that the use of the Critical Incidents Survey is a tool that allows the teacher to carry out a reflective work; it allows to identify the significant situations that the students are facing in their teaching process and its use stimulates the teacher's capacity of decision and response, who must be able to face in a strategic and innovative way.

Likewise, as an intervention tool, it is useful to raise the awareness of those involved, assessing the actions triggered, and to propose alternative actions for similar contingencies (Bilbao & Monereo, 2011).

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