# Effect of Participatory Methodologies in Academic Performance

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**Abstract.** The commitment of the academic community about their own learning has made to emerge different educational methodologies that differ regarding the treatment of the elements such as students, teacher and surrounding environment, how participate of teaching-learning process. The marked difference between constructivism and constructionism, are being studied to assess its potential compared with classic instructionist system. This paper compares two periods from 2007 to 2012 where only one of them was intervened with participatory methodologies and the results were significant. The sample used is of 341 students divided in twelve semesters, comparing differents variables such as age, genero, urban location and qualification of the subject Foods Engineering of Technology Faculty, Universidad de Santiago, Chile. based in the academic performance (Portfolio and Project). The results show a marked difference between the two periods and a significant decrease in the reprobation rate of students in the subject of Food Engineering II of Facultad Tecnológica, Universidad de Santiago de Chile.

**Keywords:** teaching-learning process, constructivism, constructionism, academic performance.

## 1. Introduction

Today educational innovation models proposed in the Teaching Learning Process (TLP) contrasting with classical constructivist models proposed. These last proposals have the teacher as the center of TLP. The teaching research is still young. But, the active and collaborative methodologies are studied only based on his methodology implementation, but rarely compares with their effectiveness in relation to their predecessors.

The Universidad de Santiago de Chile (Chile), are developing motivational politics to the insertion of innovations in methodological practices through the implementation of Teaching Innovation Projects that are awarded through grant funds every year and delivering a training proposal through the Diploma in Teaching, the impact of these policies is of much interest for Universidad de Santiago, because of continuing concern to establish quality processes in all areas, especially in academia.

The team participated in this contest and are awarded the project "Implementation of a teaching methodology of Food Engineering II course through experimentation in the classroom" which made an intervention for three years in the period 2010-2012, the results will be used to study and compare the period 2007-2009, which had no intervention participatory methodological, During the test, the academics were maintained in each subject. The research when comparing two time periods, with intervention of active methodologies (Portfolio and Project) and the other without intervention, demonstrates the significant improvement of participatory methodology in the control group. All research results are shown in this article.

## 2. Methodology

The methodology used in the project is based on the comparative analysis of information, to detect differences and the impact on academic performance through the variables:Urban Location (URL),

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Qualification high school (QHS), Age and Gender (GEN). Fig. 1, shows these variables and their relationship with experimental test.



Fig 1. Experimental Test

The study of the state of the art has been focused on educational publications, and / or university teaching conferences and online publications. The study population are students of the subject, Food Engineering II of the Facultad Tecnológica in period 2007-2012.

This period was divided into two parts, the second period was the that had active methodological intervention. The first period from 2007 to 2009 and the second from 2010 to 2012, the total analyzed sample is 341 students and is composed as shown in Table 2 set out below:

Table 1: Distribution of the population used

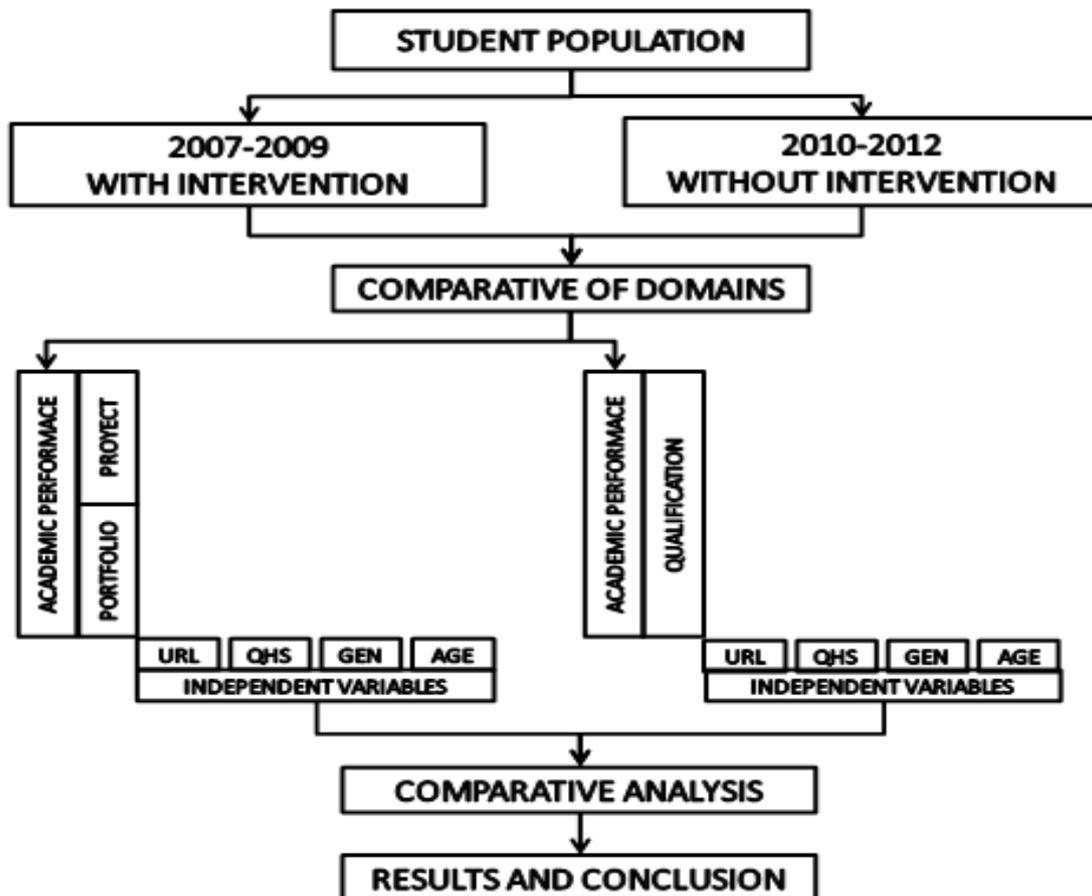| WITHOUT INTERVENTION | | WITH INTERVENTION | |
|---|---|---|---|
| Semester | N | Semester | N |
| 2007-1 | 22 | 2010-1 | 25 |
| 2007-2 | 31 | 2010-2 | Not implemented |
| 2008-1 | 25 | 2011-1 | 12 |
| 2008-2 | 43 | 2011-2 | Not implemented |
| 2009-1 | 29 | 2012-1 | 22 |
| 2009-2 | 29 | 2012-2 | 22 |
| TOTAL | 179 | TOTAL | 81 |



Fig 2. Diagram of Study Variables

In Fig.2, we can see the methodological process, the independent variables were characterized and compared to observe the similarity of the samples, and then observe changes in academic performance in each domain. This process is transparent to the contributions of active methodologies in the teaching-learning process.

# 3. State of the Art

In a world inundated by technology, the society is facing one of the phenomena that may be the cause of many health problems, social and even economic, this phenomenon is the great passivity generated by the use of technology, not only manifested in the physics passivity, also in the learning process which creates problems for teachers and their commitment to learning. Participatory methodologies allow the TLP is oriented toward understanding based on the action of the student-teacher duality, this view contrasts with the passivity that causes technological use today. This methodology requires a very dynamic teacher and not just a constructivist observer [1-4]. Requires a TLP where the elements are found active and participatory developing a group proceeding culture . Requires a PEA where the elements are active and participatory, developing a culture of group proceeding. This is where constructionism takes distance from constructivism, while constructivism intended that the learning appears by the clash between the surrounding environment and the student, with a teacher observation, while the construccionismo intended that learning evolves from social interaction, i.e. an environment, student and teacher more participatory (EST) [5-6]. According to these concepts that are much different, the participatory methodologies are more oriented to projects, where EST interaction is encouraged. Therefore, this methodology requires a teacher with skills to increase motivation, enhance communication and encourage participation in addition to their knowledge of the subject teaching [7-9].

Many authors have described participatory methodologies, which are shown as an example below:

- The group convergence in relation to profesorado is based on the attitude and aptitude. the attitude of teachers should be open, responsive and progressive, with an aptitude towards preparing oriented to the resignation of old habits [10-11].
- Participatory methodology is based on leadership the student and of the group; the first as an individual who can contribute much to their own teaching / learning, and the second as a privileged space for learning [12]. In addition, participatory methodologies are based on the development of links. In (Teacher and Student) the group are necessary for the exchange of knowledge, experience, experiences, feelings and others. It is based on collaboration and collective construction of knowledge (See Figure 3)
- This methodology is the set of processes, procedures, techniques, that actively involve the student and teacher in the TLP, the teacher/student and student/student links, who strengthened the implication responsible of the student engagement. This brings the satisfaction and enrichment to the teacher and student [13].
- Participatory methodologies and the role of the student as an active agent in the process, become a subject in guaranteed success a priori, both the process and the product [14].
- Encourages reflection on own learning and the teacher provides the necessary information for them to assess its achievements without losing sight of the agreed criteria [15].

Therefore, it is important to keep working on this line and provide the necessary resources so that teachers can play its role of catalyst and activator learning process.

Experience has shown that if you work from a participatory approach, whereby students are identified with the subject and with the model of teaching and learning that they shown, the result of the strategies teaching-learning are much better [16].

Moreover, these methodologies allow esudiante an active role. Moreover, these methodologies allows the estudiante an active role in the TLP [17]. Therefore, it is important to note that it is necessary that the group should be enabling, ie to be able to prepare and develop links that enable a fast, secure and uniform shift of information, creating a stage of maximum likelihood learning.
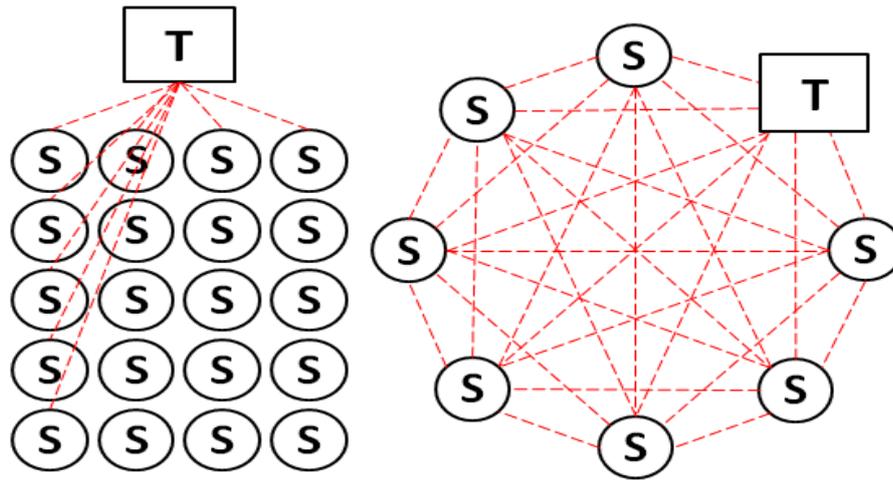
Fig. 3. Centered Methodologies in Teaching and Participatory.

# 4. Analysis and Graphics

## 4.1 Sample characterization

The sample is established of the semester 2017-1 to 2012-2, with two breaks in 2010-1 and 2011-1, because the program did not run.

The population consists of 341 students in the prior period mencionado, and is proceed to distinguish their characteristics by urban location, age, QHP and gender. The Fig, 4 shows the urban population distribution studied, with a notable slant towards the south of the city of Santiago.

| NPT | : NORTH WEST |
| NOR | : NORTH |
| NOT | : NORTH EAST |
| CEN | : CENTER |
| SPT | : SOUTH WEST |
| SUR | : SOUTH |
| SOT | : SOUTH EAST |
| OTR | : OTHER |
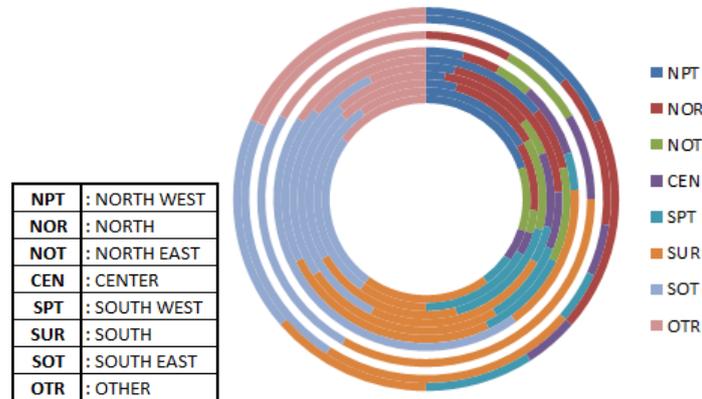


Fig. 4. Urban distribution of the population studied.

The show is basically composed of students in the south of Santiago, showing uniform and comparability.

Furthermore, the age distribution of income polación corresponds mostly to estudinates of 17 and 18 years old, which can be seen in Figure 5.
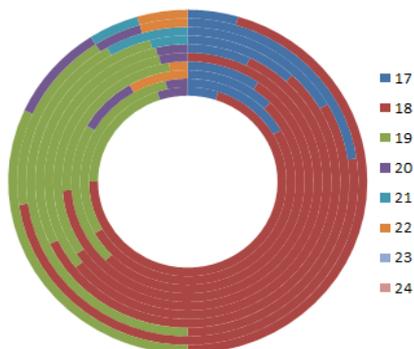


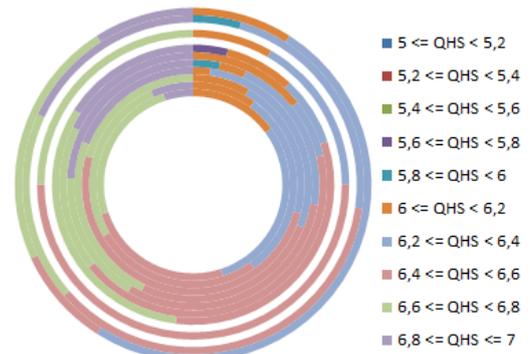Fig. 5. Age distribution of the population studied.



Fig. 6. QHP distribution of the study population.

Regarding the QHS, population has had a QHS greater than 6, this trend can be seen in Figure 6 furthermore, the population is markedly female, which can be seen in Figure 7.
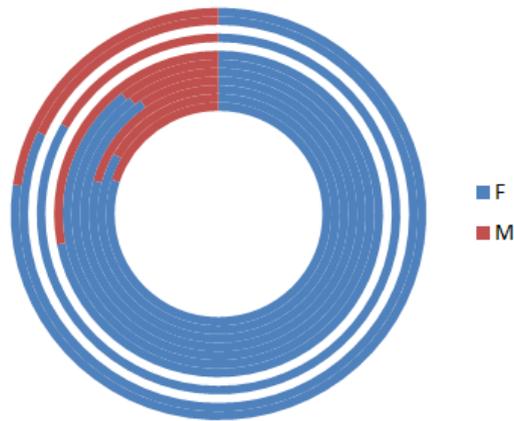


Fig. 7. Gender distribution of the study population.

After observing the characterization of the sample, we can estimate that it is a very steady and constant population during periods of study, so it was decided to use it for analysis to academic performance.

## 4.2 Academic Performance

Were performed relations between academic achievement and interventions, considering that for the period 2007-2009 was only one final qualification and for the period 2010-2012 was two the first portfolio and second a project then is proceeded the analyze the qualifications, before and after the intevención.
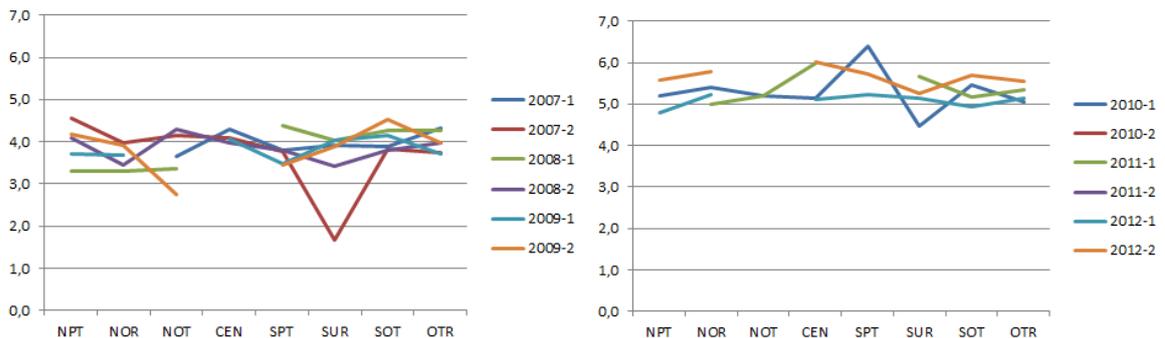


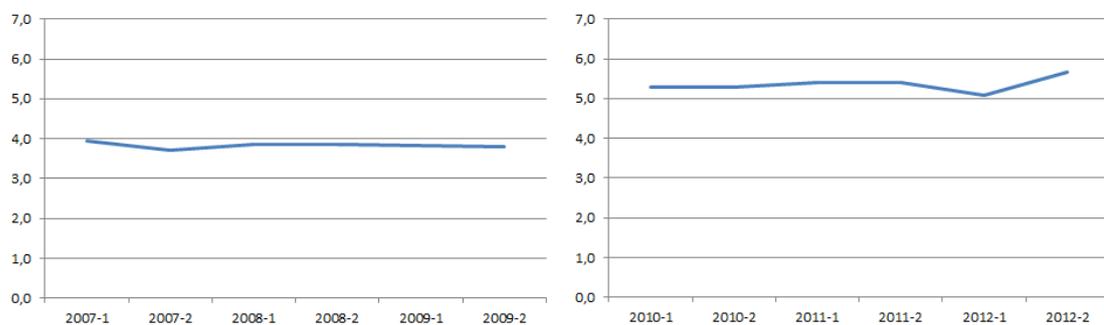Fig. 8. Academic Performance (Portfolio) for urban distribution before and after the intervention.



Fig. 9. Average academic performance (Portfolio) for urban distribution before and after the intervention.
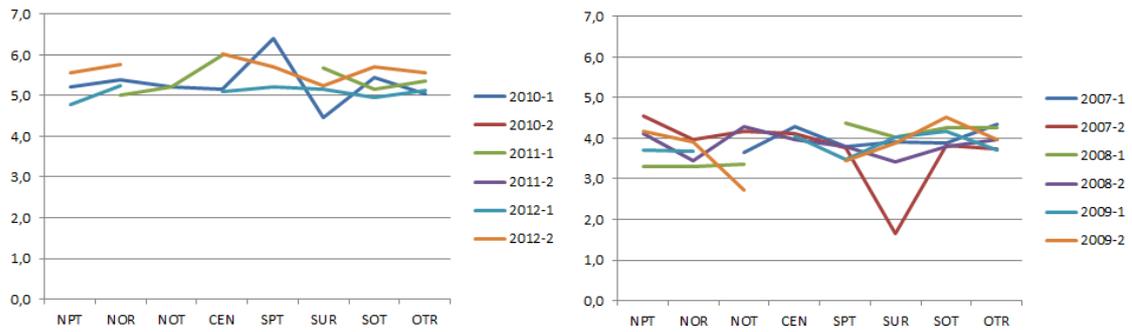
Fig. 10. Academic performance (Draft) for urban distribution before and after the intervention.
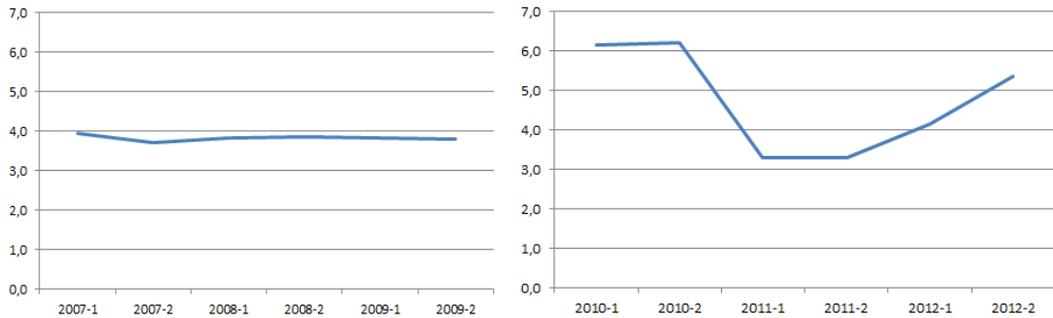


Fig. 11. Average academic performance (Draft) for urban distribution before and after the intervention.

By looking at Fig. 8, it can be determined that in the period 2010-2012 there is a substantial improvement in performance compared to the qualification of Portfolio and clearly is best for all semesters. In the Fig.9. the averages can displayed and is verify that aumento.Este behavior is repeated when academic performance is compared to the project qualification, which can be seen in Fig. 10 and 11.
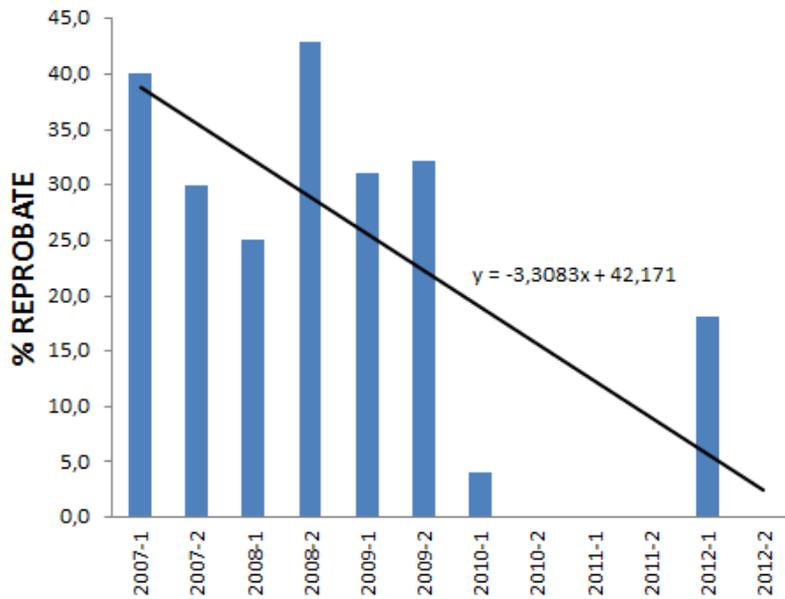


$$y = -3,3083x + 42,171$$

Fig. 12. Distribution of failure in the population and its trend line.

The power of participatory methodologies can be seen in Fig. 12 where is see the contribution and the tendency of the disapproval of students from 2007 to 2012.

## 5. Conclusions

After observing the graphics and check the performance in the period 2007-2009 (when there was no intervention with participatory methodologies). we see that this performance is lower than in the period 2010-2012 (when there was intervention participatory methodologies). Therefore, it can be concluded that methodologies participatory had a positive effect on increasing the academic desepeño, however can not be verified that learning is better. To do this, you must develop a new project to monitor changes in learning due to participatory methodologies.

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