THE SCHOOL-UNIVERSITY-RESEARCH INTERACTION AS AN INSTRUMENT TO IMPROVE THE TRAINING OF STUDENTS BOTH IN HIGH SCHOOL AND UNIVERSITY

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Abstract

Nowadays the relationships that can be established between secondary education and university can be considered as a tool for learning improvement and the orientation of the students in their academic future. If we use as a link the learning of common concepts already seen in high school and university, and research developed at university, different activities can be carried out that could be useful for both university and high school students.

Traditionally high school stage has been seen as an independent time from university, where students are trained to prepare their way to university. This point of view had as consequence that many students, when arriving at university, did not find the expected formation due to lack of information, preconceived ideas, prejudices, etc.

On the other hand, within the university studies, one of the capacities in which it is currently emphasizing is the development of their communicative capacities. Oral expression is of vital importance for the university student: thanks to it, they will be able to communicate results, discuss, etc. and fundamentally in their development once outside university, from job searching, papers, etc. Today, more than ever, the communication of information in a clear manner is an indispensable capacity and should not be underestimated in the training of our students.

Knowing these needs, a plan of action has been established by San Jorge University, Ánfora School and GATHERS research group belonging to San Jorge University. In this project, they try to alleviate these needs of students, both university and high school.

The origin of this activity takes place in the subjects of the degree of Pharmacy of San Jorge University: Analytical Techniques (second year) and Documentation and Scientific Methodology (third year). Through these activities, students made a series of presentations at Ánfora School to high school students. In these lectures university students explained both concepts of Analytical Techniques and environmental problems from the perspective of the subject. On the other hand, Documentation and Scientific Methodology subject students exposed the necessary process to carry out an investigation, and the steps to obtain a scientific result. Through these presentations, university students exercised their communication skills in a different environment, and also explained concepts seen in class, which helps to set concepts under the premise that there is nothing better to learn about something than having to explain it to others. In addition, high school students in these presentations had the opportunity to get in touch with first-hand university students, with whom they could interact and share experiences about university experience.

Presentations from San Jorge University students have been evaluated in three ways: self-assessment of the speakers, students and lecturers. The results show a satisfaction of more than 90% on the part of the assistants and of the speakers recommending it for the future courses.

Within Anfora School, at the same time as these presentations are made and, in collaboration with GATHERS research group, students have the opportunity to participate in different experiments. In these assays, students have the opportunity to apply the knowledge acquired in real environmental assays, which helps to set academic concepts and, at the same time, become aware of what the scientific world and research is.

Keywords: university, high-school, research, assay, presentation, oral presentation.
1 INTRODUCTION

At the time of proposing this project, the education of the student was raised, not as an individual who is studying a year of study, but as the individual with all his potential, with his interests and his objectives. That is why a global process was proposed where different stages of education were put in contact, both the institute and the university, and these two are joined by the research stage.

Three working groups were contacted. On the one hand, Ánfora School, where the project activities would be carried out, and where their students would be one of the participating student groups. On the other hand, the San Jorge University, with its students of second of Analytical Techniques and third of the subject of Documentation and Scientific Methodology. Finally, the research group GATHERS would contribute their research experience and part of their staff to the project.

Within the teaching, the improvement of the students' oral expression and the understanding and interpretation of the language has been one of the primary objectives in the school. However, within the educational field a differentiation between spoken and written communication takes place, giving a secondary character to the written one.

Due to this consideration, students have acquired their language skills spontaneously, thanks to their interactions with their social environment mainly. Despite the equalizing factor of oral abilities carried out by the media, school interaction the circumstances of each person continue to mark their communication skills and in some cases giving rise to prejudices that can mark the professional career of the staff, if we keep in mind that a personal interview is the cover letter that can open or close doors.

When a student arrives at the university, these gaps in communication are accentuated because the opposite effect occurs between the need to clearly express the knowledge acquired in public against the prejudices that the student has in his / her collegiate stage. This is why the subject must progressively learn in order to improve their communication skills, as presented by Staab, 1982[1] "It is vitally important to provide students with many opportunities to speak, to different audiences and with diverse purposes"

The methodologies used around the oral language according to Cots, 1995[2], must be carried out at three levels of language: the form, function and the sociocultural meaning.

- **Form**: where the student will take into account the structures and rules of the language in order to evaluate them and use them for the proposed objective.
- **Function**: adapt the language to the context in which it is circumscribed (inform, entertain persuade to organize ...). Since according to Kaufman and Rodriguez, 1993 "Different functions require different fabrics, they deal in different ways with words, sentences, constructions ..."
- **Sociocultural meaning**: the language must be adapted to each situation depending on the environment, public, political situation.

In summary "If the objective of a pedagogical program is to train competent individuals in the different uses of a language, an essential component of this program must be the student's ability to reflect on language as a form of social action” ... " A realistic and pedagogically useful communicative competence model must be able to incorporate both the purely formal aspects of the language system and those whose presence is subject to variation depending on the discursive, spatio-temporal, psychological and socio-cultural context in which the need arises. Communicate with others "(Cots, 1995: 18-19)[2]

Based on these concepts, the project falls within the subject of Analytical Techniques, belonging to the second year of the degree in Pharmacy and Documentation and Scientific Methodology, belonging to the third year of the Pharmacy degree. In the subject of Analytical Techniques, chemical concepts are described that the student will have to internalize and apply in many aspects of his professional life and especially if he decides to take a scientific path. The subject of Pharmacy and Documentation and Scientific Methodology teaches the application of the scientific method in the area of Health Sciences, including the management of bibliographic databases and skills for critical reading and communication of scientific texts.

As a complement to these two subjects and in collaboration with the Ánfora school, a proposal has been developed through which the student will improve their communication skills, exposing themselves to a different audience and outside of their university environment. In the preparation of these papers, the student can do individually or in pairs, both in preparation and in the exhibition,
being able to choose a language as Spanish or English. The presentations may be made in different formats as will be seen later (power point, videos ...) and may apply different techniques (gamification, discussion from the presentation of a problem).

In addition to improving their communication skills, the student will set the concepts seen in class since indirectly we are applying the methodology of "teaching others". On the other hand, through this activity as well as carrying out a formative and awareness-raising action for the Ánfora students through the selection of topics of interest selected by the teaching team. Through these presentations, a training activity is carried out to the students of the Ánfora School through the topics that will be proposed: description of the Pharmaceutical profile, presentation of environmental problems both in the recycling of pharmaceutical medicines (SIGRE) and both fluvial and atmospheric discharges.

One of the activities that is included in these presentations is the possibility given to the Ánfora students to interact with university students. This interaction gives students a vision of the path that awaits students once they finish their high school period. This part will focus on the path followed to reach the university, the problems that may arise, how to make decisions and finally how to face some university studies. This activity, despite being in a time where information is easily accessible, allows students to obtain first-hand information from students who were not much in the same situation as themselves, which encourages much more the exchange of information.

Finally, through the relationship between the Ánfora School and the GATHERS research group of the San Jorge University, the students of the school have the opportunity to participate in scientific tests, logically in their own tasks. In these tasks, students contribute their knowledge in chemistry, mathematics and environmental sciences in the preparation of samples, devices and obtaining results. Subsequently, the results are analyzed in class in order to reinforce concepts seen both in class and in the presentations.

All this leads to a project where different students participate in different activities obtaining a mutual benefit that results both in their academic and personal development and that have a great impact on their future, both for the university student, reinforcing concepts and improving their oral communication as for the high school student, where he can expand his vision to the world and especially to the future that awaits him whether he is a university student or not.

2 METHODOLOGY

At the time of developing a methodology, the following objectives were set:

The main objective of this project is to develop a series of methodologies that allow both high school and university students to benefit from a three-way relationship between Colegio Ánfora, San Jorge University and the GATHERS research group at San Jorge University.

The secondary objectives for this activity are the following:

- Design an activity that perfectly suits the students of the subjects of Analytical Techniques and Documentation and Scientific Methodology to improve their communication skills. Because it is a pilot experience we must adapt to the needs / availability of students for the development of this activity.
- Develop a new environment where students will be exposed to an audience other than the university, making them adapt.
- Design of new material by the student. Initially the student will be given a series of topics that must be developed in his presentation and that will be related to the subjects of Analytical Techniques and Documentation and Scientific Methodology. Once elaborated, it will be supervised by the teachers. The parameters of these presentations will be the student's own responsibility (duration, format, language).
- Set concepts seen in class through the methodology of "teaching others" and that we are indirectly applying.
- To develop a formative activity in Ánfora School: through topics that are interesting for them: to inform about the abuse of drugs, environmental problems, explain what a pharmacist is and its impact on society, importance of university studies ...
- Development of an evaluation system that allows to correct the deficiencies observed in the application of the activity, in the quality of the presentations, the amount of information received
by the students attending. For this, an evaluation will be applied from three points of view, where the student will self-evaluate himself, an evaluation will be made by the teaching team and finally from the point of view of the students attending the presentations. In the beginning it is thought that the final evaluation will be reversed in the final grade of the subject.

- Conduct questionnaires in order to implement improvements for successive applications of this activity.
- Implement scientific essays at the Ánfora School, so that they are accessible to the student and their participation is encouraged.
- Include in the classes the concepts seen both in the papers and in the scientific essays.
- Analyze and disseminate the results to the entire educational community through presentations, congresses or articles.

Based on these objectives at the beginning of the course, meetings were organized with the professors of the subjects of Analytical Techniques and Documentation and Scientific Methodology with the teachers of the Ánfora School, in order to schedule the sessions that take place during the year: duration, theme and concepts to review. At the same time, the following tasks were programmed to carry out the project:

- Task 1: set the topics that will be the subject of the presentations among the teachers of the subjects. The themes will be selected based on their interest both for the student and for those attending the presentations. At the same time, the rubrics that will be used to evaluate the activity will be designed.
- Task 2: selection of participants. The students of the subject of Analytical Techniques will be informed about the possibility of participating in the project and the different available topics will be offered.
- Task 3: Once the students participating in the activity have been selected, a consensus will be reached with them on the mode of participation, that is: power point presentation, video, game, problem presentation.
- Task 4: Carrying out a series of lectures for students of the Ánfora School. In this case. A period of time will be agreed, depending on the availability of the students to make the presentation.
- Task 5: second selection of the participants of the subject Documentation and Scientific Methodology, commenting on the possibility of participating in the project and the different available themes will be offered.
- Task 6: Once the students participating in the activity have been selected, a consensus will be reached with them on the mode of participation, that is: power point presentation, video, game, problem presentation.
- Task 7: Carrying out a series of lectures for students of the Ánfora School. In this case. A period of time will be agreed upon, depending on the availability of the students to make the presentation.
- Task 8: trials of the GATHERS group throughout the year, incorporating available Ánfora students.
- Task 9: Evaluation of the activity through self-evaluations, evaluations by the teachers and by the assistants. The activity will also be evaluated in order to detect points of improvement. In the classes by exercises or exams the concepts seen in the essays and in the papers will be evaluated.

The evaluation is carried out at three levels through different surveys designed by the teaching team:

1. Self-evaluation: through this methodology the student develops a critical spirit, takes responsibility for their successes and mistakes.
2. Evaluation by the teaching team: the professors will evaluate the activity following a rubric that integrates all the aspects to be assessed but that above all will focus on the main objective of this activity, which is that the student improves their oral communication skills.
3 Evaluation by the students attending: the same students of the Ánfora School will complete a questionnaire, in order to determine the amount of information transmitted which will be an indicator of the quality of the presentation.

3 RESULTS

The most relevant results obtained through the surveys show that 90% of the students found the activities interesting, 95% would repeat this type of activities more often and 85% found them useful. Among the students-speakers 100% found the activity useful and they would repeat it. Scientific results are currently being published in Q1 resumes from tests carried out at the Ánfora School.

4 CONCLUSIONS

The main objective of the project is focused on students improving their communication skills in an environment different from the university to which students are accustomed. Two activities were carried out during the course. In a first activity a group of 5 students explained how to perform the calculations in a laboratory, referring to real cases and fiction, which have appeared in movies. In the other activity, a student made a presentation and an exercise about how a research process is carried out, from the appearance of the problem to its resolution using scientific methodology.

The valuation cannot be more positive. The implication on the part of the students has been total, arriving to surprise me in some moments, so much by the preparation as by the ease with which they realized the two activities. In the first activity it was a group of students and the responsibility diffuses within the group, being more difficult to evaluate an improvement or performance within the group. However, in the second activity, with one student, their involvement and participation in the project could be better appreciated. The participating students integrated much better the knowledge they taught in their presentations and although it is not significant, the students approved the subjects on which this teaching innovation project is based.

On the other hand, the acceptance by the students of the Ánfora School has also been very satisfactory. In both activities, 30 students met voluntarily and were very participative in both the proposed activities and when asking questions and encouraging debate.

The evaluation of the other two professors USJ, responsible for the subject: Documentation and Scientific Technology, has also been very satisfactory, highlighting, above all, the involvement of the student, both in the development of the content and in the moderation of the activity.

One of the highlights of this project is the quality of the presentations and the maturity shown by the students when presenting their respective papers. They knew how to adapt to the audience they had, they prepared some contents adapted to high school students and above all they overcame the difficulties that appeared at each moment with ease and very good attitude, with which the challenge of presenting and teaching a new audience in a different environment They overcame it. Another thing to highlight, would be the social work done with the students of the Ánfora School, not only showed knowledge, but also gave a vision of what is the university world and research very important for students in short time must decide their future.

REFERENCES