

## Cooperative Work for Teacher Training

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*Abstract:* - Many training strategies for teacher training have been developed to train university lecturers. Our objective in this paper is to analyze the cooperative work as a strategy for training university teachers in the context of a Training Program for new lecturers at the Polytechnic University of Valencia. We will describe the training Program and its key for training university teachers: Base-Group strategy. Further on we will explain its norms and how they work. Finally we will analyze the advantages and drawbacks found when they have been used. As far as we know, there is no further published research about cooperative work for teacher training.

*Key-Words:* - Teacher training, training strategies, cooperative work.

### 1 Introduction

Starting in the academic year 1998-1999, the Teacher Training Institute of the Polytechnic University of Valencia has been offering an initial training course for university lecturers called Initial Pedagogical Training for University Lecturers (FIPPU).

The objective of this course [1] is to acquire the basic competence in order to start and successfully develop a teaching career at university level. We divide this competence in three fields:

1. Pedagogical competence
  - To build the teaching-learning process
  - To manage the working methods and learners' learning tasks.
  - To use different strategies to communicate pedagogically.
  - To use correctly different resources in the teaching and learning process.
  - To manage interaction between teachers and learners.
  - Learners' tutorship throughout their studies.
2. Institutional competence.
  - To fully educate learners.
  - To work in cross-disciplinary teams with a focus on educational innovation projects.
3. Social- professional competence.
  - To develop thought processes in the teaching methods.
  - To face duties and ethical dilemmas found in the university teaching activities.

In order to achieve this competence there have been formulated several training strategies, one of them being cooperative work through small groups

called base-groups. This way, teachers can use their own experience in order to motivate cooperative work in their students [2, 3]. Despite other teacher collaborative methodologies such as the ones presented in [4 and 5], we will use only lecturing collaborative techniques.

The paper is structured as follows. Section 2 will describe the University training Program FIPPU. Its key for training teachers, namely Base-Group strategy, is explained in section 3. Section 4 shows the questionnaire used for obtaining the advantages and drawbacks of the base-group strategy. Results obtained and our analysis are given in section 5. Finally, the conclusions and further research are explained in section 6.

### 2 What is FIPPU

The Initial Pedagogical Training for University Lecturers (FIPPU) is held along one academic year and lasts 250 hours, ranking from September to October the following year.

The training activities are developed with the assistance of experts on university pedagogy, scholars of the university, tutors, and advisers of the Teacher Training Institute (ICE).

Several teaching methodologies are used in the programme, whose basic principle is flexibility, both in its progress as in its adapting to the individual needs and situations of each participant.

The structure of the programme is mainly divided in four kinds of work:

- Core Theoretical Training, which consists of theoretical seminars whose main focus is on the competence to be developed.

- Complementary Theoretical Training, which fulfils the development of specific competence derived from each teacher's personal training project.
- Practical Training, which implies taking part in groups of work which meet on a regular basis in order to share experiences, analyse their teaching methods, and so on. All this process is supervised by a pedagogical adviser from ICE.
- Teaching Portfolio, which consists of the development of a progressive work of the teacher and which allows the assessment of the acquired competence in the training process.

In order to do so, several training strategies are used: intensive seminars, training workshops, symposia, collaborative work in base-groups [6], teaching portfolio [7], video recordings, tutorship, and so on.

### 3 Historical Background

The developed cooperative work is set in a series of meetings organized by base-groups belonging to the 9<sup>th</sup> edition of the Initial Pedagogical Training for University Lecturers (FIPPU). Each base-group is formed by around six teachers and the tutorship of a pedagogical adviser, whose goal was to prepare the ground for the cooperative work. The ultimate objective was for every teacher to produce a so called Teaching Portfolio, an open flexible document which conveys a deep thought about the improvement of the teacher's pedagogical competence and which implies a process of progressive revision and improvement. The FIPPU program has been going on for 9 years. During this period 268 lecturers have taken part in it. Their ages were between 28 and 50 and the average age has been 36 years old.

Figure 1 shows the FIPPU evolution age age-wise. Lecturers younger than 36 are more keen on taking part, probably due to fact that the interest in improving pedagogic training is combined with a need in new lecturers to be promoted. The graph variations are also influenced by other aspects like contract policy in different departments, a fact not analyzed here. Nevertheless, there is a considerably large amount of experienced lecturers who also decide to widen their pedagogical skills, being aware of new research in the field and the need to update their methodology by attending a systematic program like FIPPU, which provides them with an accurate knowledge of the constructivist theories of learning.

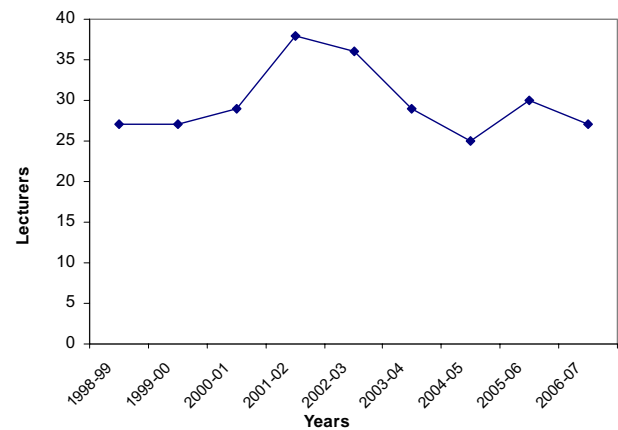


Figure 1. Evolution of the FIPPU

Our university is made up of 15 schools. Table 1 shows the names of schools and faculties whose lecturers have taken part in any of the nine FIPPU editions so far. Also the acronyms used for each school are included.

The lecturers teaching at the Polytechnic University of Valencia belong to one of the 29 existing departments. Table 2 shows the names of those departments whose lecturers have taken part in any of the FIPPU editions as well as the acronyms used for each one of them.

Figure 3 shows the number of lecturers from each department who have taken part in any of the nine FIPPU editions so far.

The department with a larger number of participants is DOEEFC with 17 lecturers. After this one are DSIC, DICGF and DFA with 15 lecturers. These are departments either with a recent structure and therefore with new lecturers or with a high index of teaching and researching activity. In contrast there are some departments with very little participation, showing then a smaller amount of activity, a fact which turns into a scarce training request for their lecturers.

However, generalization in this sense might be inadequate, since participation in the FIPPU program is decided individually by each lecturer with the assistance of a tutor and therefore does not respond to an agreed decision in the department.

Figure 4 shows the number of lecturers who have taken part in any of the FIPPU editions depending on their belonging to one of the schools or faculties of the Polytechnic University of Valencia. The school with a larger number of participants is ETSII with 38 lecturers, followed by ETSIS with 33. This fact can be found to be obvious if we consider the fact that these are two of the oldest schools of the university. This fact also implies a larger number of students and lecturers and a higher index of training activities.

Name of school	Acronym
School of Computer Science	EI
Higher Polytechnic School of Alcoy	EPSA
Higher Polytechnic School of Gandía	EPSG
School of Agricultural Engineering	ESIA
School of Architecture	ETSA
School of Building Management	ETSGE
School of Applied Computer Science	ETSIA
School of Civil Engineering	ETSICCP
School of Design Engineering	ETSID
School of Engineering in Geodesy, Cartography and Surveying	ETSIGCT
School of Industrial Engineering	ETSII
School of Telecommunications Engineering	ETSIT
School of Rural Environments and Enology	ETSMRE
School of Technical Architecture	EUAT
School of Applied Computer Science- Faculty of Computer Science	EUI-FI
School of Agricultural Engineering	EUITA
School of Industrial General Engineering	EUITI
Faculty of Business Administration and Management	FADE
Faculty of Fine Arts	FBBAA
Faculty of Computer Science	FI
Others	H and M

Table 1. Acronyms of schools.

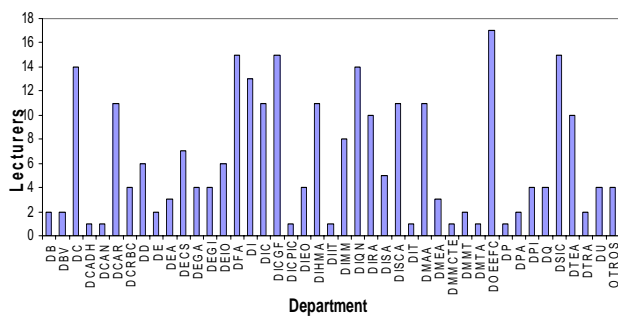


Figure 3. Number of lecturers department-wise.

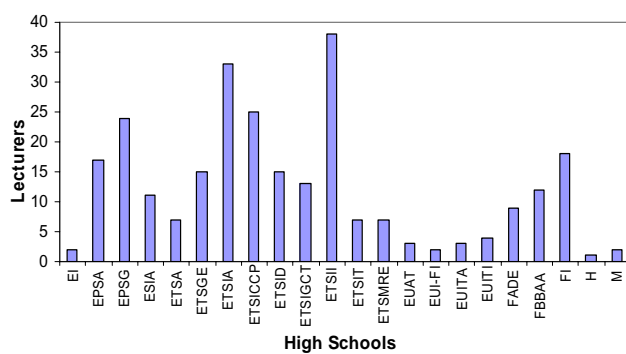


Figure 4. Number of lecturers school-wise.

There are few cases of schools or faculties with little or no representation at the FIPPU program, a fact which implies a positive value and support of the teaching community of the university.

#### 4 Base-group strategy

The base-group teaching strategy consists of making five to six teachers' groups and a pedagogical adviser who meet on a regular basis about once a month. In these meetings a number of common objectives are

Name of department	Acronym
Dept. of Biotechnology	DB
Dept. of Vegetal Biology	DBV
Dept. of Communications	DC
Dept. of Audiovisual Communication, Documentation and History of Art	DCADHA
Dept. of Animal Science	DCAN
Dept. of Architectural Constructions	DCAR
Dept. of Conservation and Restoration of Cultural Heritage	DCRBC
Dept. of Drawing	DD
Dept. of Sculpture	DE
Dept. of Agroforest Ecosystems	DEA
Dept. of Economy and Social Sciences	DECS
Dept. of Graphic Expression in Architecture	DEGA
Dept. of Graphics Engineering	DEGI
Dept. of Applied Statistics and Operational Research, and Quality	DEIO
Dept. of Applied Physics	DFA
Dept. of Applied Linguistics	DLA
Dept. of Construction Engineering	DIC
Dept. of Cartographic Engineering, Geodesy and Photogrammetry	DICGF
Dept. of Construction Engineering and Civil Engineering Projects	DICPIC
Dept. of Electronic Engineering	DIEO
Dept. of Hydraulic Engineering and Environment	DIHMA
Dept. of Transport Infrastructure and Engineering	DIIT
Dept. of Mechanical and Materials Engineering	DIMM
Dept. of Chemical and Nuclear Engineering	DIQN
Dept. of Rural and Agrifood Engineering	DIRA
Dept. of Systems Engineering and Control	DISA
Dept. of Systems Data Processing and Computers	DISCA
Dept. of Land Engineering	DIT
Dept. of Land Engineering	DMAA
Dept. of Agrarian Mechanisation	DMEA
Dept. of Mechanical and Materials Engineering	DMMCTE
Dept. of Thermal Engines and Machines	DMMT
Dept. of Agrarian Technology and Mechanisation	DMTA
Dept. of Business Organisation	DOEEFC
Dept. of Painting	DP
Dept. of Architectural Projects	DPA
Dept. of Engineering Projects	DPI
Dept. of Chemistry	DQ
Dept. of Computer Systems and Computation	DSIC
Dept. of Food Technology	DTEA
Dept. of Applied Thermodynamics	DTRA
Dept. of Urbanism	DU
Dept. of Architectural Composition	
Dept. of Graphics Engineering	
Dept. of Electrical Engineering	
Dept. of Textile and Paper Engineering	
Dept. of Vegetal Production	OTHERS

Table 2. Acronyms of departments.

discussed. These groups can be considered to be the main part of the FIPPU programme, since they allow contact between the members of the group in a constant way.

The objective of this kind of strategy is to develop academic, professional, social and communicative competence [8]. After that, teachers are organized and motivated for cooperation [9, 10].

The goal of this strategy consists in giving support each one of the group members so that they can

achieve their personal goals, as well as providing a search for common objectives in as much as the similarities of the fields of the teachers can offer and be needed. In summary, this technique offers skills for cooperation, as well as creating an individual sense of responsibility on each one of the students [11, 12].

These base-groups are formed within an intensive seminar, an activity which sets off the programme. For that, a number of specific criteria are taken into account. The group is started in the intensive seminar since, as their first task, they are entrusted to think about a name that will identify them. For that purpose, they all have to make suggestions and agree on a final decision.

According to Johnson and Johnson, 1990, the definition of collaborative learning is [3] “the instructional use of small groups so that students work together to maximize their own and each other’s learning”. This definition fits perfectly well into the initial strategy subject of this study. Furthermore, the same authors consider that this process is a gradual one in which each member feels mutually committed to each other’s learning, a fact which generates a positive cross-dependence which does not imply competition.

Taking into account the fact that heterogeneity can bring a big amount of richness into the group, the most important requirement in the formation of the groups is the fact that teachers belong to different teaching areas. This way, a wider view of the topics dealt with can be obtained, and different points of view not so commonly thought of can come up in the discussions. In the approach of the program the figure of the tutor turns out to be essential and, for this reason, the new teachers can rely on the support of a pedagogic adviser and a tutor of their teaching area. The functions of each one of them, which can be seen later, are complementary. The pedagogic tutor who is assigned to every base-group has as basic tasks: to provide an expert vision of everything that carries the teaching-learning process; to become a guide along the program and to offer support before any difficulty that the teachers might find in their teaching practice, both to an individual level as in the team. On the other hand, the tutor chosen by every new teacher is a colleague with longer teaching experience and must belong to the same speciality. Thus, the advice is guaranteed in those aspects more technical that the rest of components of the group cannot estimate due to the fact that they belong to different areas.

In these periodic meetings there are two basic lines of discussion: the topics necessary for the accomplishment of the individual portfolio and the personal concerns of the new teachers arising from

their thought about their educational tasks. The portfolio is a dossier that every new teacher delivers obligatorily on having finished the course and, in it, the efforts realized by the teacher are reflected in order to achieve personal aims to improve their role as teachers. The places where the meetings of the base-group are carried out are normally small rooms that favour the formation of a helpful environment where work can be easily done. In addition they are provided with the audio-visual means necessary to be able to carry out the different activities that form the program, such as the visualization of the recordings of the teachers of the group during one of their classes. Due to the diversity of schedules of the members of the group and in order to facilitate the next meeting, on having finished every session, a day, time and place for the meeting is agreed.

In every base-group a secretary is appointed whose task is to be bridge between the rest of components and the pedagogic adviser. Another task is to keep the minutes of each one of the meetings. The minutes are checked by the pedagogic tutor and, later, it is sent via e-mail to each one of the participants. In this record there are gathered the tasks and the main issues, as well as the assignments to be done for the following meeting and the day of the meeting.

## 5 Questionnaire for base-group valuation

In order to be able to analyze the weak points and establish the adequate thought, a survey was carried out aimed at the members of each base-group. The items are as follows:

Advantages:

1. How does the base-group improve your motivation?
2. How does the based-group help its members to face a situation from different points of view?
3. Do the educational strategies from other base-group members show you new teaching methodologies?
4. Does the base-group help establish friendship and support between members?
5. Bringing personal experiences to the group.
6. Exchanging complementary information related to the teaching career (conferences, access to vacancies, and so on)
7. Working for the achievement of common objectives, but not leaving aside personal goals.
8. To confirm strong points of your teaching methods through analysis of one of your lessons.

Drawbacks:

9. Difficulty in finding a date for meetings

10. Being unpunctual, a fact which carries waste of time.
11. Talking about topics not related to the agenda.
12. Need of more time to agree on certain ideas.

Questions:

13. Despite the possible difficulties faced, are you satisfied with the work done in the base-group?
14. Did the meetings help you write your teaching portfolio?

## 6 Questionnaire results and their Analysis

In this section the obtained results are shown and so, following the data, the possible meditation is analysed, a fact which can help confirm the strong points and to improve the weak ones of the cooperative work for the formation of university teachers. It is obvious that the cooperative work improved the motivation to a high extent of the participating teachers.

In figure 4 we can see the results corresponding to the motivation of the teachers. In this respect it is necessary to emphasize that only for 4.17 % the strategy had little effect on the motivation. The major index of answers was given in the option "quite", with 54 %. Bearing this in mind, it is possible to argue that the cooperative work improved the motivation of the participating teachers as opposed to other strategies.

Attending to the results shown in figure 5, we can say that the fact of presenting different points of view to the same situation enriched the personal possibilities of every participant in a moderate or significant degree. 45 % of the participants inclined for the option "quite", whereas only 8.33 % did it for the "little" option. Undoubtedly the possibility of interaction between the participating teachers meant the interchange of experiences and hence the enrichment of the personal points of view.

Obviously the diversity of strategies represents an element that has an effect on every matter in a particular way. Figure 6 shows that the used strategies affected a little or quite a lot in the respective teaching areas of every teacher. In general a tendency is observed in the data to support the idea that the cooperative work improved the different strategies used by the teachers. Therefore it can be stated that the strategies used in the teaching could have increased the confidence of the teacher as consequence of the cooperative strategy.

The data shown in figure 7 comes to prove that the friendship and support between the components of the base-group improved widely, which undoubtedly had positive consequences on the rest of elements of interaction of the participants (motivation, scope of

the activities, interchange, etc). In this direction it is possible to argue that the cooperative work reverberated positively on the competition for the interaction of the group.

Figure 8 shows that the experiences of the members of the group enriched the activity of each of the participants. The exposition of other experiences different from the each one's had a positive effect when it came to view the learning problems from a different vantage point and therefore enriching. It is significant to see that no participant gave an opposite opinion.

It is evident that the cooperative work supposed the interchange of complementary information to favour the teaching career of the participants and this way it can be stated by the data shown in figure 9. The common activities approach, orientated to improving the teaching curriculum, had a positive effect on each of the members that, only for 4,17 % it meant a scanty effect in their interchange of information and nobody posed void impact. Therefore it is necessary to indicate that the teacher that is formed in an area of cooperative work has major opportunities to reach their teaching objectives in the short term.

It is important to be able to arrange both levels of aims, and the cooperative work throws information on the good march with regard to the attainment of the common and personal objectives. According to the data shown in figure 10, by no means did the common objectives prevent or affect negatively on the personal objectives.

According to the information shown in figure 11, one of the outstanding aspects that improved with the cooperative work was to confirm both strengths and weaknesses of the personal teaching. If we add the information on the answers "quite" (50 %) and "very much" (33.33 %) we can get an idea of the importance of this aspect for the improvement of the personal teaching. Undoubtedly this question served to reaffirm the strong points of each one of the participants, as well as the improvement of those weak points that had been detected with the help of the base-group.

It is obvious that the cooperative work implies the need of being adapted to a common schedule in order to develop the activities. Nevertheless, the answers given in figure 12 state that the difficulty to find a date for meetings seems to be the main drawback found by most teachers who answered the survey. This is so since merely 8.34% of them found little or no difficulty to set a date.

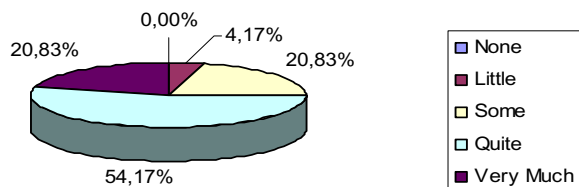


Figure 4. To improve motivation

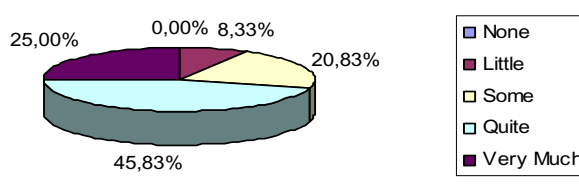


Figure 5. To present from different points of view

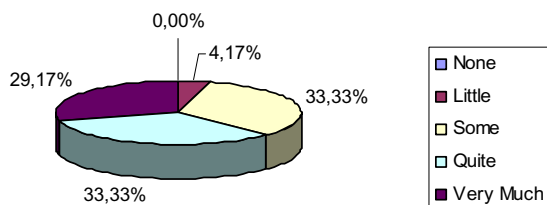


Figure 6. Application of the strategies used

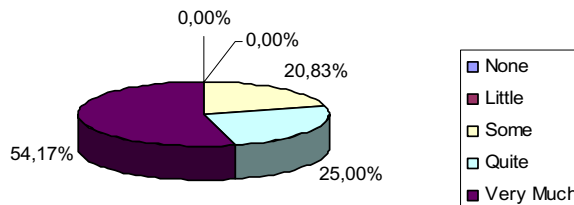


Figure 7. Creating friendship and support bonds

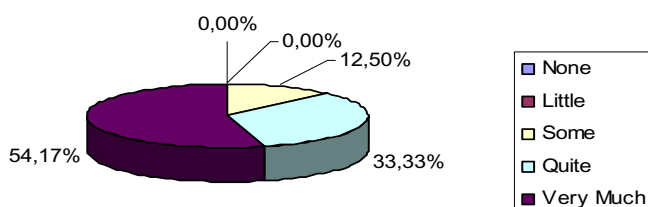


Figure 8. Bringing complementary personal experiences

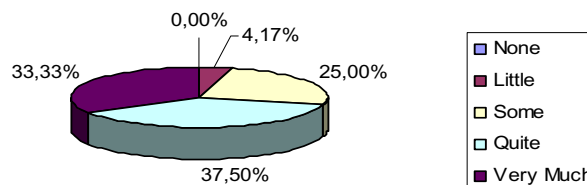


Figure 9. Exchanging complementary information

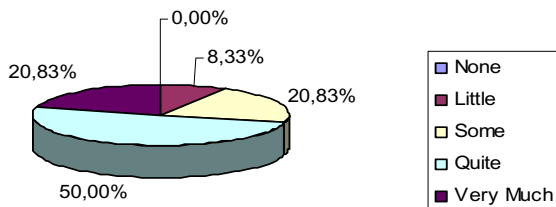


Figure 10. Working to achieve common goals

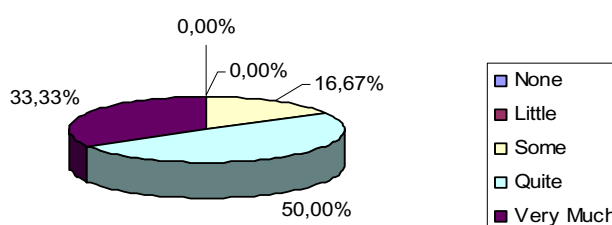


Figure 11. Strengths through class recording

Nevertheless, the lack of punctuality, leading to an unnecessary waste of time, is the least important drawback found in the survey, as it is shown in figure 13. We regard this as a cultural fact, its results depending on the location where the survey is taken.

Figure 14 deals with talking about topics not related to the agenda, which is another one of the drawbacks and comprises a fact that makes participants lose their attention. The answers for “very much” are not really meaningful (12.5%), but if we add them to both “quite” (16.67%) and “some” (41.67%), all three represent the second least favourable percentage.

However, the need of a bigger time investment in order to discuss ideas was not a main drawback, contrary to what might have been thought (see figure

15). Even though the answers “some” (37.5%) confirm the big amount of time investment needed to achieve agreement, we can assume from answers “quite” (25%) and “very much” (12.5%) that the percentage of teachers who regard it as a drawback decreases.

The next item deals with whether you are satisfied of the work done in your base-group in spite of the difficulties that you have found. The results are shown in figure 16. The response has been categorical. Whereas for 91.67 % the work was satisfactory, only 8.33 % disagrees. Here are confirmed thus the answers that have been previously analyzed and that would determine a valuable strategy for teaching improvement.



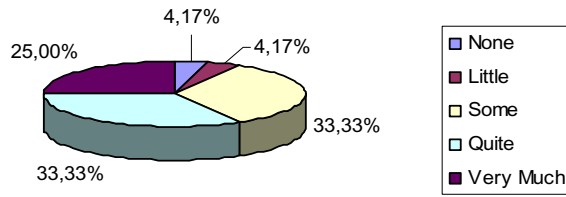


Figure 12. Difficulty in finding dates for meetings

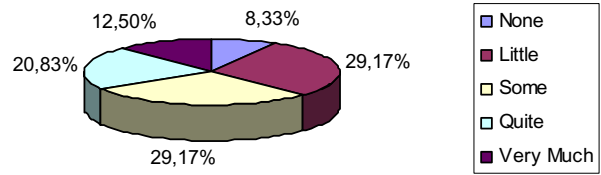


Figure 13. Time wasting due to unpunctuality

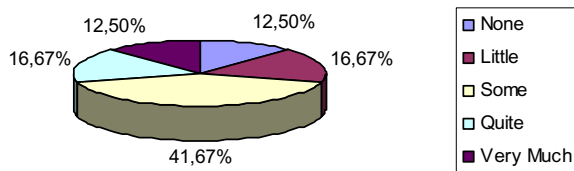


Figure 14. Talking about topics not related to the agenda

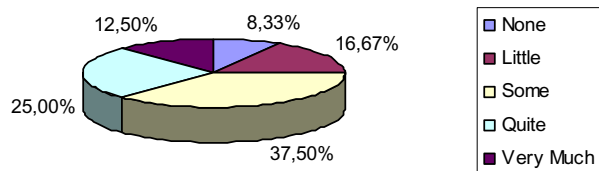


Figure 15. Need of more time to agree on certain ideas

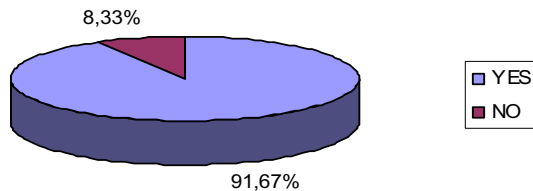


Figure 16. Are you satisfied with the work done in the base-group?

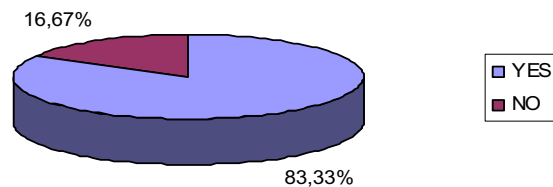


Figure 17. Did the meetings help you write your teaching portfolio?

The last question (whose results are shown in figure 17) is if the meetings have helped you to complete your teaching portfolio. With regard to the effect of the cooperative work in the attainment of the educational portfolio an outstanding 83.33 of participants thought that this strategy was essential.

Finally, a few open questions were asked where the opinions of those taking the survey were required. They were as follows:

- Check schedule availability before forming base-groups.
- More time for entertainment, since friendship is one of the most important values obtained.
- I don't think the portfolio should be the key element of this seminar.
- The meetings and cooperative work have definitely had a positive influence on my approach to learning.
- The Portfolio shouldn't be the most important aspect of FIPPU. Rather than a "diary-folder", there should be activities which give as a result a clear improvement in our teaching methods, taking advantage of the cross-disciplinary character of the base-group. In order to do so, the management of the teaching innovation in our courses should be aimed at presenting papers in seminars or articles about

teaching, always with the support of an ICE pedagogical adviser.

## 7 Conclusions

In order to work in a cooperative way, it is necessary to share experiences and knowledge and to have a very clear common objective in which feedback is essential for success. The thing to be learnt can only be achieved if the work of the group is cooperative. It is the group's task to decide how to do the job, what the procedures will be, how to divide the workload, and what tasks are to be done.

Cooperative work, if not essential to obtain the major objective in the framework of FIPPU, happened to be very enriching. Especially exchange of experiences and communicative intercourse between the participating members had an outstanding effect in order to make a progress in the learning process.

We should point out that no member found a single negative effect in the strategy and in general results were optimistic or very optimistic in some cases.

The teaching improvement was specially affected by the recording of one of the lessons, an event which caused the reaffirming of the strengths of each one of the participants, as well as the improvement of the weaknesses. Not even the issue of finding a date for the meetings was an important factor which might devalue this learning strategy.

It can be therefore argued that motivation, a key aspect in learning processes, was improved with the help of cooperative learning, as opposed to other learning strategies. An outstanding 91.67% of participants thought that cooperative work resulted in a useful strategy in order to achieve the learning objectives.

*References:*

- [1] Instituto de Ciencias de la Educación, *Formación inicial pedagógica para el profesorado de la Universidad Politécnica de Valencia*, Ediciones UPV, 2006.
- [2] Johnson, David W., R. Johnson, and E. Holubec. *Circles of Learning: Cooperation in the Classroom*. Edina, Interaction Book Company, 1990.
- [3] Johnson, D. W., Johnson, R. T., and Smith, K., "The state of cooperative learning in postsecondary and professional settings, *Educational Psychology Review*, Vol. 19, No. 1, 2007, pp. 15-29.
- [4] Noppamas Pukkhem, Wiwat Vatanawood. A Multi-Instructor Cooperative Model for Supporting Learning Objects Aggregation based on XML-Based Planning Strategy. WSEAS Transactions on Computers. Issue 10, Volume 4, October 2005.
- [5] Dragan Stokic, Ljubisa Urosevic. System for Provision of Content/Context Specific Services for Collaborative Learning in Enterprise Networks. WSEAS Transactions on Information Science & Applications. Issue 2, Volume 4, February 2007.
- [6] Abdulhussain E. Mahdi. Peer-Supported Learning Groups: A Collaborative Approach to Supporting Students Learning in Engineering and Technology. WSEAS Transactions on Advances in Engineering Education. November 2004.
- [7] Hsien Tang Lin, Chi Huang Chiu, Shyan Ming Yuan. The Construction of Course Management System with Portfolio. 5th WSEAS International Conference on Telecommunications and Informatics (TELE-INFO '06). Istanbul, Turkey, May 27-29, 2006
- [8] Slavin, R.E. Comprehensive approaches to cooperative learning, *Theory into Practice*, Vol. 38, No. 2, 1999, pp. 74-79.
- [9] Antil, L., J. Jenkins, S. Wayne, and P. Vadasy. Cooperative Learning: Prevalence, Conceptualizations, and the Relationship between Research and Practice. *American Educational Research Journal*, Vol. 35, No.3, 1998, pp. 419-454.
- [10] Jenkins, J. R., Antil, L. R., Wayne, S. K., and Vadasy, P. F., How Cooperative Learning Works for Special Education and Remedial Students, *Exceptional Children*, Vol. 69, No. 3, 2003, pp. 279-292.
- [11] Cohen, E.G. Restructuring the Classroom: Conditions for Positive Small Groups, *Review of Educational Research*, Vol. 64, No.1, 1994, pp 1-35.
- [12] Cohen, E. G., Lotan, R. A., Abram, P. L., Scarloss, B. A., and Schultz, S. E., Can groups learn?, *Teachers College Record*, Vol. 104, No. 6, 2002, pp. 1045-1068.