

The Student and Professor's Portfolio: Elements of Group Mentoring

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Abstract

Mentoring, understood both as a tutoring as well as educational support and also seeking the development of skills and completion of academic objectives has become a subject of vital importance in the framework of the European Higher Education Area. In this paper we present a number of proposals on Group Mentoring that our research group has developed over the past academic term. The use of the portfolio is proposed to enhance the student's performance and improve their instrumental and interpersonal skills. Also, the use of the professor's portfolio is upheld as means of evaluation and continual improvement of the teaching activities during the mentoring sessions.

Keywords

Group Mentoring, Better Performance, Proficiencies, Portfolio.

1. Introduction

1.1 EHEA

As we are all well aware, the European High Education Area (EHEA from now on) was established by the European Union to harmonize the European Higher Education systems in order to ensure a homogenous structure amongst the graduate and postgraduate levels. In other words, an equivalent value of the workload found in the subjects, courses, studies



and grades as well as a common degree structure and continued training throughout the Member States. This philosophy, which grants Europe with a homogenous University System, flexible and compatible allowing for a greater student and graduate mobility, is complimented with the idea of establishing a level of quality and transparency which enhances the attractiveness of the system and boosts its international competitiveness.

To achieve this end, provided by the undergraduate studies, the student has to acquire general knowledge in a specific subject area which guarantees them sufficient personal proficiencies (scientific and technical, ethical and social) and constitute basic teachings and general training. Besides, this first cycle comprises learning oriented towards more professional activities, structured around a set of skills, abilities or competences which will qualify them to reason, form judgments and communicate in an efficient manner, as well as manage systems of normal complexity, always through a set of social and ethical responsibilities.

During the postgraduate study programs, the student will receive advanced knowledge that will provide them with a basis to develop original and independent work, even in a research context, since the purpose of these programs is to further specialize the student in an academic, professional and researcher background (MSc and PhD).

It appears logical that, in such a context, the student becomes the center of the system, its main agent, which is why the efforts they carry out in order to acquire their knowledge have to be evaluated and not only the lecture hours they are mandated to assist. Furthermore, the philosophy of learning must change as well, granting more importance to the utilization of the educational tools rather than the mere accumulation of knowledge. Another important aspect linked to the previous one is the preparation towards ongoing training during the academic and professional life of the graduate.

1.2 Competences of the undergraduate

The education traditionally imparted by the Spanish universities has been characterized by the transmission of knowledge and the development of highly specialized professionals. The acquired title will serve the graduate as an accreditation to fulfill the roles assigned to



a specific career profile. As a consequence of this system, the job market integrates graduates and post graduates characterized by a high degree of professionalism. Nonetheless, recent researches suggest that this is not enough: businesses and users of public services demand a set of competences that have not been acquired by the graduate such as instrumental proficiencies (managerial duties, language skills, and computer know-how), interpersonal skills (written and spoken expression, leadership and teamwork) and cognitive abilities (decision-making skills, critical thinking, common sense and creativity). Likewise, a set of skills not directly related to the academic field has been missing. These include: adaptation to change, integration, versatility, mobility, availability, implication and commitment to the position and the firm. The lack of these attributes justifies the need for change, which can be implemented by taking advantage of the current university framework. Finally, a significant part of the responsibility for this change has to be accepted by the professor as a new concept of the student-centered method of teaching.

2. Group Mentoring

Group-wide mentoring, supplied by the university, can be an efficient tool to bolster the learning process and the autonomous development of the student, such as the acquisition, integration and implementation of the proficiencies in action. Proficiencies that, inexcusably, all university undergraduates must possess and know how to apply as a certification of their abilities, upbringing and professional and human value. It is with good reason that the University Mentoring's reason for being is, in terms of academic-professional and personal counseling, a relevant endeavor for all university students and educators. It branches as well into other dimensions: it projects a more fulfilling and integral education, it facilitates new methodological approaches, boosts the autonomous learning abilities of the students by their competences, etc.

Moreover, group mentoring is the process of guidance of a group of students with the objective of opening a space for communication, conversation and group-wide orientation. A sphere of knowledge where students have the opportunity to review and discuss alongside their tutor the subjects of their most interest, inquietude and preoccupation as



well as improving their academic performance, solving problems, developing study, reflexing, social and cohabitation habits. (De Serranos and Olivas, 1989).

Group Mentoring helps develop the essential intellectual skills related to research and information gathering, critical thinking, reasoning, argumentation, analysis, summarizing, relational search and practical application of theoretical knowledge. All of this is done through a process of experimentation, acquisition of learning techniques, data analysis, case studies, open debate forums and interactions between the group members. All along these sessions other social competencies are indirectly developed, such as: communication, listening, tolerance, open-mindedness, open dialogue, socialization, initiative and entrepreneurship.

Group Mentoring (GM) arose organically to address the needs of extremely large groups during the learning process. In such large groups there are instances of student passiveness towards their own education, low participation levels and incredibly low levels of assistance to conventional tutoring (Junta de Andalucía (Cidua), 2005).

There are various problems that emerge when conducting Group Mentoring sessions. The most prominent one is the importance of establishing the members of each group since a balance has to be struck between the knowledge, skills and attitudes of the group. Another aspect would be its configuration taking into account that time is needed for a group to be consolidated since there are no previous working habits with this teaching model; on the other hand, each group has a different learning rhythm and the professor must observe its evolution through each member's participation which may lead to a failure to meet the proposed objectives, henceforth the importance of a well-defined and well-explained objective proposal.



3. The Portfolio: An element of work

3.1 Definition and Objectives

According to the R.A.E., the portfolio is a “Hand briefcase for the purpose of carrying books, papers, etc.” Aside from the literal meaning of this word, “portfolio” has been imported from the Anglo-Saxon context “Portfolio Assessment” which could be translated into Spanish as an “Evaluation folder” o “Portfolio Process”. Therefore a portfolio is a document designed with the task of providing qualitative and quantitative information, illustrating the achievements, skills and experiences the group has obtained regarding their objectives.

Fundamentally, the main objectives of the Portfolio are:

- Guide the group during their activities and the perception of their progress.
- Stimulate the students not to comfort to the current results and make them more concerned with their learning process.
- Outline the importance of creativity and the concept of the group and integrate previous knowledge into the learning experience.
- Establish the groups strengths and weaknesses regarding the academic curriculum.
- Promote autonomous and critical thinking within the group which, on one hand, guarantees a general formation for the group and, on the other hand, establishes different areas of knowledge for each member to immerse into.
- Develop skills to locate the pertinent information in order to formulate, analyze and solve problems.

3.2 Development

The portfolio will provide with the maximum amount of relevant information regarding the educational progress of the group. Therefore, the data gathering phase, prior to its processing and evaluation, is extremely important. The compilation and selection of relevant information is the longest but most important part of the whole process. The



organization of the information will be easier if indexed the same way as the final portfolio. The presentation of the portfolio must be organized and consistent. A cover is needed with the name Group and Topic title. Finally, in order to provide some assistance to the persons who will be reviewing the portfolio on a later date it is recommended to number every page and include a section index.

There exists a certain consensus among the authors that have worked on the subject, which distinguish the following phases when developing a student portfolio (Barberá, 2005):

Phase 1. Information gathering

This stage focuses on compiling, debating organizing and reviewing the necessary documents. These documents could be of different content: conceptual, procedural, ideas,...; proceeding from different sources since the tasks could have been generated in class or outside the class (conceptual maps, exams, monographs, reports, interviews,...) and be on a different physical mediums (digital, paper, audio, etc.).

Phase 2. Information selection

At this stage, the best Works have to be chosen or the parts of those activities that show a better development in the education process to be exposed before the professor and the rest of the students.

Phase 3 Evaluation of the selected documents

This phase is necessary because if afterthoughts are not included group weaknesses may not be detected and improvements will not be taken into consideration.

Phase 4. Portfolio Elaboration

During this phase, all the evidence gathered is structured and organized in a comprehensible fashion valuing creative and outside-the-box thinking while maintaining the dynamic and evolutive nature of the process. The portfolio, although it can also have an electronic format, will be presented paper bound. Portfolio management is a constant exercise. The summary diagrams for each unit will also be provided with examples, proposed exercises and their grade, which will be based on the exposition as well as the written documents attached to it.



More specifically, our portfolio will be structured around four blocs: first, it will be composed of the minimum, mandatory activities that are compulsory for every member of the group; the second bloc will be based around the exposition and presentation of those tasks; the third bloc will be designated towards any optional activities that the group members find relevant and the final bloc will be reserved for references, learning stages and their critical assessment which will be used to compile the thoughts on the subject matter, their personal progress and how they were feeling during the learning process.

Based on these 4 blocs, the requirement levels will be defined as follows:

Minimum requirements, which will correspond to all those activities which are mandatory for obtaining a passing grade.

Complimentary activities, which can be suggested by the professor or freely brought up and that will show a general idea of the students attitude during the mentoring sessions.

Within-group suggestions, that will provide an idea of the information and experiences acquired by the group and gauge the group's initiative and implication in the learning process.

In order to fulfill the Portfolio's function in an optimal fashion, the mentor has to review their activities through-out the sessions, interacting with the group which will lead to an in-depth knowledge of the group's evolution and later improvement of the final results.

4. Scope of action and Methodology

The proposed approach follows a full program of Group Mentoring (GM) sessions applied to the subject of Calculus, a basic, 6 credit subject from the first semester of the first year of various engineering degrees. 0.45 credits, out of 0.9, belong to Laboratory Practice (LP) and the other 0.45 to GM. The sessions will be distributed as follows: 6 meetings lasting 1.5 hours each, 3 of those dedicated to GM. Both LP and GM will each be worth 10% of the final grade. The GM sessions will be held during the months of September, October and November as to not interfere with the first round of exams, which start in December. The Center proposes to alternate between GM and LP.



The ordinary group is divided into smaller circles that hold between 12 and 15 students each. These circles, after an evaluation of previous knowledge will be divided again into 3 groups between 4 and 5 people each, to homogenize the academic levels of the work sessions. This final assembly of people will be the actual GM. Since the students which we are working with are all the first year students, they are classified according to previous studies (Technological or Social Sciences Background, Trade School backgrounds, previous centers, student's current proficiencies and attitudes.

Each of the 3 groups develops their own material: a summary-diagram of the subject with specific examples to ensure the proper understanding, proposed exercises regarding the subject matter that will be used, alongside the exercises evaluation sessions, to compliment the group's portfolio that will be used for the GM's evaluation.

Each GM session will be distributed into three 30 minute blocs:

1st: Exposition of the session's topic by the members of the group, delivery of the proposed exercises as well as corrections and additional points to those exposed by the Lectures.

2nd: Group solving of the unit evaluation exercises.

3rd: Corrections and evaluation (averaging the group grades over the presentation, which will add to the average of the grade of the work done during the session).

The presentation of the topic of the following mentoring session and the proposed exercises will be done during an in-class exposition.

Some of the group mentoring sessions that have been successfully executed, as well as their methodological proposals are described hereafter:

September – October GM1: Calculus Fundamentals GM

General Objectives: Improve the academic performance in all Mathematics-related subjects; generate a positive attitude to avoid frustration and desertion; develop the following skills: study habits, teamwork, creativity and decision making.

Specific Objectives: To establish basic concepts and algorithms; homogenize mathematical knowledge to ease the adaptation to the university framework; to work on the usage of the mathematical language.



Methodology: diagnostic evaluation where the needs of the student are detected; search for materials that may facilitate the understanding of the subject; organization of the materials; delivery of the GM portfolio composed of: summary-diagram, examples, proposed exercises and evaluation exercises.

Some of the contents that have been studied in the framework of this GM are: Real and complex numbers; Inequalities and inequations; Functions and sequences; limits and continuity; derivatives and their applications; immediate integrals, integration methods and area calculation.

During the evaluation stage we take into account: spoken answers which show the comprehension and utilization of the basic concepts of the subject; solutions to the problems de-signed to test the abilities and skills acquired; evaluation exercises for distance participation students.

October – November GM2: Support GM

Objectives: Improve academic performance, act on topics with proven difficulty by previous promotions, and develop the following skills: learning habits, teamwork, creativity and decision-making.

Methodology: diagnostic evaluation where the needs and deficits of the student are detected; search for materials that may facilitate understanding of the subject; organization of the material; delivery of the GM portfolio composed of: summary-diagram, examples, proposed exercises and evaluation exercises.

Some contents: Taylor's Formula; Improper and Parametric Integrals, Functions of Several Variables: Dominion, image, level lines, Limits and Continuity, Derivability and differentiability, extrema.

Evaluation: Spoken answers which shows the comprehension and utilization of the basic concepts of the subject; the solutions to the problems designed to test the abilities and skills acquired; evaluation exercises for the distance participation students; portfolio evaluation taking into account the notes of the expositions and the answers of the group

November – December GM3: Real World Math Applications GM



Objectives: Many students view the subject as something distant from the rest of courses, which is why the main objective consists in searching for practical applications of any of Mathematical concept.

Methodology: a basic set of guidelines is established and it is proposed it is proposed to prepare a presentation which will be defended publicly.

Some Contents: the group is given freedom to research for practical applications of the topics covered by the course.

Evaluation: within-group knowledge sharing, elaboration of a tree diagram that connects the subject to the selected topic.

5. Evaluation

Evaluating a portfolio, more so if it is a group one, is a complex procedure that involves much more than merely assigning a grade. Our intention is to prioritize a teaching model that is based on group-wide learning which is why we give a special attention to the management and skill development. We understand that the evaluation has a transformative function and must be done consistently during the teaching process. And all of this must lead to an expected result, fulfilling the groups expectations and delivering a fair and satisfactory final product.

The evaluation process has been done continuously and always interacting with the students, allowing us to review their work done so far before the final evaluation. Our evaluation system comes from a global vision of the portfolio, not from a mere sum of its parts.

We have evaluated the portfolio starting from a series of indicators that show us the group learning process which become the determinants of the final grade. Some of the evaluation criteria that we have used are as follows: organization, presentation, choice of contents and its management, development of independent thought, etc. In short, these criteria are closely linked to the competences that are expected to be developed during group mentoring sessions as well as the objectives set by them.



These indicators are listed below:

- Presentation: identification and location of the activities and people who form the group.
- Written expression: must be clear, accurate and with impeccable grammar.
- Information presented, which must be current, diverse and balanced (extracted from external sources) and thoughtfully selected.
- Organization and integration: it must be clear for the professor the learning process that the group has followed and their ability to relate each one of the activities to achieve a global vision.
- Complementary and optional activity selection.
- Creativity: contents, ideas, suggestions, work selection, language and form.
- Implication, participation and commitment.

6. The Portfolio or Professor's Diary

The professor's portfolio can be conceived as a product developed with the express purpose of providing evidence of their teaching function and the opinions they merit as well as the teaching objectives they set for themselves. Therefore it can be attributed two main functions: a supporting role, since it acts as an external showcase and a teaching role, since it allows an overview of the pedagogical function and the objectives derived from it. The Portfolio has a standard format. There is consensus that it has to encapsulate two blocs: personal presentation and the forethought. During the personal presentation the tutor presents their queries, weaknesses and strengths and contemplation on what the teaching process means for them. The evidence and forethought is the central bloc of the portfolio and includes a set of samples of the teaching functions as well as the posterior remarks. The evidence bloc must build a representative sample of everything that constitutes group mentoring. This part is open to also include other evaluation techniques, teaching actions, student evaluations, contributions of colleagues, etc. Any evidence must be accompanied



by their respective afterthought that makes it clear which aspects the tutor has taken into consideration into the planning phase and execution of the group mentoring. In the after-thoughts, the teacher analyzes every incident occurred during his teaching and presents ways of professional improvement. For example: if an exercise has shown lower results than expected, what criteria are considered for a positive evaluation, etc.

In this way, the portfolio works as an instrument that allows to contemplate on the teaching-learning process and forms the basis on which the professor-tutor establishes the educational objectives.

The portfolio is being written from the classroom experiences with the student group assigned to a set of GM sessions. A continuous analysis is done over the workings of the classroom and the effectiveness of the lecture hours.

The constant entries in the Portfolio, which should be written at the moment the GM session has concluded, could be as follows:

1. How did the day go? A summary of the planning, objectives and the vision of what has transpired in the classroom.
2. Difficulties. What was the biggest challenge? Possible solutions.
3. What has worked? Why did it work?
4. Others: this section should comment on any aspect that can't be fitted into any of the previous sections.

Some of the most notable aspects of the first sections are: each group's level of satisfaction, the groups that feels at ease with the chosen method, participation in the group discussions and different suggestions to the improvement of the academic results.

The tutoring sessions have been executed without major difficulties. Maybe the only notable problem is that allowing the sessions to develop according to what is happening in class leads to a deviation from the plan and delays that make difficult to cover part of the as-signed issues. There were also problems due to conferences programmed by the Center, which caused delays and changes of some of the sessions, for this reason we point out the necessity to improve the organization of the sessions.



Amongst those things that worked correctly we would like to outline the importance of encouraging debates and discussions, which has been achieved. They were always based on quite a solid knowledge and had a rigour which is not usually found in the first-year students. As a future improvement and in order to enrich future sessions, activities that would test the reading comprehension of the group could be proposed as well as a group assignment dedicated to the elaboration of an article on the subject.

7. Conclusions and final remarks

From the results obtained by our students, we would like to mention the high number of passing grades (coming close to 80%), although on the other hand there is a very low number of students that obtain the highest mark (only 5%).

When students are asked for their level of satisfaction: 25% are very satisfied with the course, 35% are moderately satisfied, 30% are satisfied, 7% are poorly satisfied and 3% are not satisfied at all.

When asked about their thoughts regarding the development of their proficiencies, those that were considered the best developed were placed in the following order: analysis and synthesis of information, problem-solving skills, critical thinking, oral expression and creativity.

For all of the above, we consider that our efforts are going in the right direction

8. References

- Aronson E., Patnoe S. (1997). *The jigsaw classroom: building cooperation in the classroom*. Addison Wesley Longman, New York.
- Barberá E. (2005). *La evaluación de competencias complejas: la práctica del portafolio*. Educere. Venezuela.



Barragán R. (2005). El portafolio, metodología de evaluación y aprendizaje de cara al nuevo espacio europeo de educación superior. RELATEC: Revista Latinoamericana de Tecnología Educativa. Universidad de Extremadura.

De Serranos, G. y Olivas, A. (1989). Acción tutorial en grupo. Escuela Española. Madrid.

González J., Wagenaar R. (2003). Tuning. Educational Structures in Europe, Universidad de Deusto.

Junta de Andalucía (Cidua). (2005). Informe de la Comisión para la Innovación de la Docencia en las Universidades de Andalucía. Sevilla

Otero J.A. et al. (2011). Algunas actividades docentes en las asignaturas de Matemáticas en el marco del EEES, Actas 15 JAEM. Gijón.

Otero J.A. et al. (2014). Group tutorials: Some experiences, Conference Proceedings 4TH VALENCIA GLOBAL.

Shea G.F. (1992). Mentoring, London, Kogan Page.

Tejada J. M., Arias L. F. (2003). El significado de la tutoría académica en estudiantes de primer ingreso, Revista de Educación Superior, Volumen 3, N° 127, pp. 25.

Universidad Autónoma de Barcelona. (2004). Documento marco sobre la tutoría en la Universidad de Barcelona. Barcelona.

Universidad de Oviedo. Declaraciones de la Sorbona y Bolonia y Comunicados de Praga, Berlín, Bergen, Londres y Lovaina, (1998, 1999, 2001, 2003, 2005, 2007 y 2009).
http://www.uniovi.net/zope/EEES/faq/marco_legal

