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Educational Innovation: A Study of Differential Changes among Teachers at the University of Malaga

Innovación educativa: un estudio de los cambios diferenciales entre el profesorado de la Universidad de Málaga

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Abstract

Educational innovation is a factor that has been highlighted in the last years as a developmental element in classroom life. This study is an attempt to identify possible differences in different settings, among teachers who had launched an innovation project, and others who had not. For that purpose, a questionnaire was distributed among the faculty of the University of Malaga. The sample consisted of 112 teachers, 29 of whom had undertaken projects of innovation. The results show that significant differences exist between the two groups of teachers in relation to pupils, other teachers, resources, and use of aids and educational programming. The paper concludes with a profile of innovative teachers and some reflections on the importance of innovation and its role in the educational reforms currently taking place.

Key words: Educational innovation, teacher training, university professors, teacher evaluation.

Resumen

La innovación educativa es un factor que ha destacado en los últimos años, como elemento de desarrollo en la vida de las aulas. En esta investigación, se trató de identificar posibles diferencias, en distintos ámbitos, entre docentes que habían puesto en marcha algún proyecto de innovación, y otros que no lo habían hecho. Para ello se repartió un cuestionario entre el profesorado de la Universidad de Málaga. La muestra constó de 112 profesores, 29 de los cuales tenían en marcha proyectos de innovación. Los resultados muestran que existen diferencias significativas entre ambos grupos de profesores en relación con el alumnado, el resto de docentes, los recursos, la utilización de las ayudas y la programación docente. El trabajo concluye con un perfil del profesorado innovador y algunas reflexiones sobre la importancia de la innovación y su papel en las reformas educativas que se están experimentando.

Palabras clave: Innovación educativa, formación del profesorado, profesores de universidad, evaluación del profesor.

Introduction

Nichols in 1983 defined innovation as that “idea, object or practice perceived as new by an individual or individuals, which seeks to introduce improvements in relation to the desired goals, which has a natural foundation, and that is planned and deliberate” (Nichols, 1983, p. 4).^{*} Although 20 years have passed, this definition is still valid. Innovation is the effort of an agent to try more often than not to obtain an improvement based on the field of knowledge which he or she is trying to develop. To paraphrase De la Torre (1994), an innovation project is a proposed plan and its development, with the goal of changing and improving some specific aspect of education (curriculum, management of interpersonal relations or training,

^{*} Translator's note: As the original English versions of the works originally produced in that language, and cited in this work, were unavailable for use in this translation, it was necessary to employ the technique of back-translation, for which we offer our most humble apologies.

etc.) Therefore, it has to do with a planned action that implies the existence of a change not maturative, evolutionary or casual, but a change sought, planned and developed with intentionality. Change is a process of personal and organizational learning (Fullan, 1996). Since the eighties the process of innovation has been understood from a systemic perspective (Havelock and Huberman, 1980), i.e., as a chronological sequence of events, changes in strategies and attitudes, a process of problem-solving and a view of the process as an open system.

In the case of the university, the goal of educational innovation generally coincides with the pursuit of improvement in teaching. The ultimate goal is aimed, therefore, toward students, with the optimization of the classroom as a training environment (Marcelo, 1996).

Since the first approaches to the study of innovation as an educational phenomenon, the proposed models and classifications of these have been diverse. Havelock (1969) identified three models: research, development and dissemination; social interaction; problem-solving. As for Shon (1971), he spoke of the center-periphery model and the model of proliferation of centers. Domínguez (2000, quoted by Grau, 2000), reviewed the models and authors connected with innovation, which Jorge E. Grau (2000) collected and synthesized (see Table I).

Table I. Models, Perspective y Authors

Models	Perspective	Authors
Research and development	Technology	Brickell, 1964 Guba y Clark, 1967 Havelock, 1973
Organizational	Cultural	Zaltman, 1977 Brow y Moberg, 1980
Problem-solving	Cultural	Coughan, 1972 Havelock, 1973 Monish, 1978 Huberman, 1984
Cooperative decision-making	Cultural-sociopolitical	Rogers y Shoemaker, 1971 Olson, 1980 Escudero, 1984 Delomme, 1985
Social interaction	Cultural-sociopolitical	Rogers y Shoemaker, 1971 Watson, 1967 Morrish, 1978
Systematic-environmental	Technology-political	Stiles-Robinson, 1973 Banathy, 1973 Levin, 1974 Escudero, 1984

Source: Domínguez (2000, cited by Grau, 2000, p. 163).

During the past decade, the University of Malaga launched several lines of teacher-training aimed at improving teaching (Cebrián, 1997). These include:

- a) Educational documentation service.
- b) Courses, workshops, seminars and other training activities.
- c) Solicitations of projects on the improvement of teaching practice.

It is precisely this last (c), launched by the former University of Malaga Institute of Education Sciences, which comes closest to the concept of university educational innovation previously presented. As a means for change directed toward improving teaching, the projects sought to support the efforts of teachers willing to contribute their experiences and reflections toward improving their educational work. In this sense, the teacher considered as innovative is the one who has responded to one or more of these project solicitations. Throughout the study, we have at all times avoided identifying the presence or absence of new technologies as a means of innovation, since that implies a whole process of reflection that can draw on different resources—among others, the new technologies. The most common themes of the projects presented were as follows (Tójar, 1997, p. 14):

- Programming of courses and curriculum; development of aspects such as coordination and production of teaching materials.
- Introduction and experimentation of new teaching strategies or teaching resources that will encourage more active and motivational teaching.
- Development of models and instruments for evaluating classroom or learning interaction.
- Launching of joint reflection processes.

In this work we have proposed two basic objectives. On the one hand, to analyze the changes experienced by teachers during the last three years of their teaching, and on the other, to prove the differences and similarities that may exist between the general faculty (not necessarily innovative) concerning previously-valued dimensions, depending on whether or not they participated in innovation projects. These changes and possible differences were studied in several dimensions: performance and relationship with students, interaction with other teachers, use of teaching resources, research aids or support, teaching program and changes in teaching. Finally, we have attempted to provide a comprehensive profile of teachers who launch innovation projects.

To develop this work, we have used the survey technique, creating for the study a specific questionnaire with closed and semi-open questions. The data collected were analyzed descriptively, counting the frequency of response. Subsequently we evaluated the differences among teachers through the comparison of means. In the following sections, details are given regarding the procedure followed, the results obtained and the conclusions about them.

1. Method

1.1. Sample

To collect the data, we drew up a specific questionnaire sent by regular mail to all the faculty members at the University of Malaga. It set a deadline for the receipt of the questionnaires, after which, of about 1900 sent to teachers at the University of Malaga, 112 were valid. Of those, 29 came from teachers who were implementing or had implemented an innovation project the last three years. While the degree of response was moderate, the final quantity allowed us to continue with the project.

The Universities Act, implemented in 2002, replaced the former University Reform Law (URL), which was in force while our exploratory research was being carried out. The URL structured university faculty as *regular teaching staff* and *temporary teaching personnel (under special contract)*. The regular teaching staff was organized as university full tenured professor (UFTP), university full professor (UFP), director of one of the university's schools (DUS) and teacher in a university school (TUS). As to temporary teaching personnel, these were organized as teaching assistants and associate professors (full-time or part-time). The university had, according to the URL, research fellows authorized to teach, according to their type of scholarship.

Of the set of questionnaires received, 38.4% were from university full professors, followed by associate professors (25.9%) and university school professors with 17.9%. Of the total, 30.4% have a seniority of 6-10 years teaching, followed by teachers with a seniority of 3-5 years (25.9%) and academics with a seniority of between 11 and 20 years (22.3%). Conspicuous is the fact that 74.12% of the total have not participated in previous projects.

There are marked differences between age groups and teaching categories. The participating associate professors tend to have a seniority of 3-5 years, while teachers from the regular staff usually have from 6 to 20 years of experience. The university school professors stand out from the rest with between 6 and 10 years of experience (see Table II).

Table II. Teaching experience and category.
(Chi-squared: 86.97 with 24 g.l. [p<0.0001])

Teaching category	Years of experience				
	3-5	6-10	11-20	>20	<2
Associates	16	7	1	1	4
Aides	4	2			
D.U.S.			1	1	
U.T.F.P.		1	3	5	
T.U.S.	4	11	3	2	
U.F.P.	4	13	17	9	
Other	1				2

2. Instrument

The questionnaire prepared for this investigation (see Appendix I) consists of 74 questions on various aspects of interest. In the first section, teachers were asked about their area of expertise, their department and center of affiliation. It also included a block of closed questions about their teaching category, years of teaching experience, participation during the last three years in workshops or training courses, and call-ups for innovation projects, number of subjects and students.

In the second section, they were asked to answer several blocks of questions with answers arranged in a Likert-type scale of five options (very little, a little, so-so, much, very much). The aim was to gather information on the possibility that the teachers had changed in the last three years concerning the relationship with their students and the other teachers; the use of teaching resources; knowledge about research aids; educational programming; and, finally, about the cause of these changes.

The last section was to be answered by teachers who had participated in innovation projects. This third part of the questionnaire included blocks of questions organized into three areas: students, teachers involved, adequacy of resources available to begin the project; plus various issues related to processes of result transferring, their dissemination, modification of objectives during project implementation, etc.

3. Analysis and results

The data collected are qualitative, of ordinal type. On that basis there has been made a descriptive analysis of all variables, based on their frequencies, fashion, media. As well, an effort has been made to analyze the possible relationships and differences between teachers. Initially, the data suggest turning to statistics such as Chi-square, although the number of data did not allow the construction of contingency tables with enough guarantees allowing for the presence of structural zeros, and the existence of values of less than five in more than 20% of the cells. However, to compare possible differences between groups of teachers involved in innovation projects and not in innovation, we have analyzed the differences between means. This procedure should be taken only as a guide, with the limitations of these results described in the conclusions.

3.1 Questions for all participants

The first two sections of the questionnaire were answered by all the teachers, both those who had been part of innovative projects and those who had not. In the first section, they were asked to answer a series of general information questions, which allowed us to establish the base level on which to compare the responses of the 'innovative' teachers, so that it would be possible to identify significant

differences with which to establish an operational profile for each group of teachers.

This section describes the results of the first two sections of the questionnaire.

a) Faculty profile. The participating teachers usually had been assigned two to four subjects. Of the total, 33.9% taught two courses; 25%, three; and 21.4% were teaching four subjects. Similarly, 47.3% of the teachers were working with between three and four groups per course. This means that 36.6% were assigned between 151 and 300 students; 28.6%, fewer than 150 students; and 27.7%, more than 300 students.

There are indications of differences between teaching categories regarding the number of different subjects instructors teach. The university full professors usually teach two or three subjects. As for the teachers at the university schools, they usually are assigned three. The university full tenured professors develop one or two subjects, the same as teaching assistants. Finally, associate professors teach two to four courses, although, along with teachers at university schools, there can be cases where they teach five or more subjects (see Table III).

Table III. Teaching category by number of subjects

Nº de courses	Associate	Aide	D.U.S.	U.F.T.P.	Other	T.U.S.	U.F.P.
1	2	3		3	2	1	5
2	7	3	1	3		5	19
3	6		1	1	1	8	11
4	9			2		5	8
5 or more	5					1	

b) Changes in the students. When teachers were asked if they perceived changes in students in the three years preceding the survey, 52.7% said they found “many” changes regarding communication in class, although only 36.6% suggested “a lot” more class participation—a percentage similar to the number of teachers who reported having experienced “a lot” higher attendance (30.4%). These changes did not appear in regard to tutoring; the majority of teachers (60.7%) stated that attendance in it improved “a little” or “so-so”, although more than half experienced a substantial improvement in their relations with students (51.8%). When teachers were asked if they were more conscious of the teaching-learning process in the evaluation, 63.3% answered in the affirmative.

c) Changes in the teachers. Given the issues regarding the inter-teacher relationship, 43.2% of the teachers suggested a substantial improvement in collaboration with their colleagues. This is roughly equal to 44.9% of the valid questionnaires, in which it is said to have improved interpersonal relationships in general. These values are observed again when the question focuses on carrying

out the evaluation of students in coordination with other teachers, where only 41.4% said it had improved “much” or “very much” in the last three years. The value is similar when the task is the teaching program (52.7% claimed to have improved substantially). On the other hand, 49.5% of teachers have shared subjects with their colleagues from the last three years to the present.

d) Changes in teaching resources. In the next block of questions, teachers were asked to report on issues related to the use of teaching resources. A majority of the teachers (66%) said they were “much” or “very much” more aware of the school’s resources. Similar data were obtained regarding their knowledge of the operation of the magazine and newspaper archives (71.8%) and the library (79.5%). The use of school resources for teaching also showed significant improvements, rising to 64.3%. This is evidenced by the increased use of the overhead projector (66% say they have improved remarkably). However, the use of technological resources (especially the use of video) does not seem to have improved (45.2% say they have increased very little.) There were similar results shown concerning knowledge of the computer labs, where the distribution of teachers was homogeneous between choices. Thirty-four point six percent said they had improved “a little” or “very little”, and 46.7%, “much” or “very much”. Similarly, the use of the computer to give classes was little changed (45.5% said they have increased its use “very little”).

e) Changes in knowledge about research support or aids. Although knowledge of the institutional aids for research seems to have improved significantly to 42.6%, still, a large percentage (30.9%) has advanced “a little” or “very little.”

f) Changes in the programming of courses. Another point of interest focuses on finding out to what extent there have been modifications in the teaching program. An outstanding 38.7% say they make many changes, along with a 37.8% whose changes are moderate (regular). Almost half of those surveyed felt they made moderate changes in the organization of the class; 34.2% described the changes as “many.” On the other hand, 55.8% experienced significant changes (“much” and “very much”) regarding the student evaluation system, and those also related a better management of the time devoted to each thematic unit. In this regard, 67.6% of the surveyees experienced a substantial improvement (“much” or “very much”). Consistent with previous results, the teachers considered that they had experienced changes in their teaching methodology, moderate for 39.1% of them, and major for 40.9%. Therefore it is not surprising that 76.5% of the participants have made an outstanding update (“much” or “very much”) in their bibliography (see Table IV).

Table IV. Modifications in the teaching program

Items	Response options				
	1	2	3	4	5
I make changes in the programs of my courses.	1.8	9.0	37.8	38.7	12.6
I have changed the organization of my classes.	4.5	14.4	42.3	34.2	4.5
I have improved the student-evaluation system.	1.8	9.9	32.4	49.5	6.3
I administer better the time devoted to each topic or thematic unit.	2.7	4.5	25.2	51.4	16.2
I have changed the teaching methodology.	5.5	14.5	39.1	34.5	6.4
I update the bibliography with publications from recent years.	2.7	6.3	14.4	44.1	32.4

g) Changes in teaching. The next set of questions was to find out to what the teachers attribute the changes. Overwhelmingly, participants felt that the changes were due to their own initiative (91.7%) and teaching experience (89.1%); they assigned little importance to the workshops, to the seminars, and even to the innovation projects.

3.2. Questions asked of participants in innovation projects

The third section of questions was answered only by those who had participated in some innovation project aimed at improving teaching practice. The number of surveyees who met this requirement was only 29. As in the previous section questions were grouped into blocks according to the subject: students, teachers and means of carrying out innovation, as well as items relating to the achievement of objectives, transfer of results and social impact.

a) Changes in students. Regarding the students, most of those surveyed (74.3%) felt that the student participated marginally (“very little”, “a little” or “so-so”). On the other hand, collaboration to carry out the project in the classroom improved; 28.6% said that students participated a lot, and 34.3% said they participated in a “so-so” way, but presented little difficulty in adapting to the proposal. The surveyees considered overwhelmingly (42.9%, “much”; and 25.7%; “very much”) that students showed themselves motivated by the project, while their performance simultaneously improved a great deal (60% with “a lot” or higher). All this is consistent with a positive acceptance of the proposed changes and a good evaluation of the innovation by the students (see Table V).

Table V. Modifications in the teaching program

Items	Response options				
	1	2	3	4	5
Participates in the design and development of projects.	20.0	28.6	25.7	14.3	11.4
Collaborates in the classroom with the development of the project.	14.3	14.3	34.3	28.6	8.6
Has difficulty in adapting to proposed innovation.	26.5	32.4	26.5	11.8	2.9
Innovation has served to motivate him or her	0.0	8.6	22.9	42.9	25.7
Has improved his or her achievement, thanks to innovation.	0.0	5.7	34.3	45.7	14.3
Has accepted with pleasure the changes introduced.	5.7	5.7	25.7	51.4	11.4
Appreciates your innovative work.	5.9	8.8	35.3	35.3	14.7

b) Changes in teachers. Of those surveyed, 61.7% said that teachers have been involved in the evaluation of the project. They believed in a higher proportion (73.5%) that it has been very helpful and motivational in the work of teaching (70.6%). Just over half of the participants (52.9%) were very satisfied with the innovation, and 23.5% chose the option “very much.” For 79.4%, the innovative action allowed them to increase their interest in improving their teaching practice.

c) Support or aids for innovation. Financial assistance received for the innovation projects was seen as “low” or “so-so” by 60.6% of the teachers. When asked if the institutional support had been enough, there was no agreement among the participants; the distribution of the options over the scale was uniform. Conspicuous in this block of questions was the fact that 35.5% said that the pedagogical counseling offered in connection with the projects was meager. None of those surveyed chose the option “very much” (see Table VI).

Table VI. Resources for innovation

Items	Response options				
Has been sufficient...?	1	2	3	4	5
Financial aid	15.2	27.3	33.3	15.2	9.1
Institutional support	18.8	18.8	25.0	21.9	15.6
Pedagogical counsel	16.1	35.5	25.8	22.6	

d) Objectives and dissemination of projects. As expected, 78.6% of those surveyed claimed to have achieved the objectives of the innovation project. However, apparently there were more problems in the dissemination of their results, so that only 46.4% chose the option “much” or “very much”; 35.7% think the dissemination should be classified as “so-so” (see Table VII.)

Table VII. Achievement of objectives

Items	Response options				
	1	2	3	4	5
Objectives of the project have been met.			21.4	60.7	17.9
Results have been adequately disseminated.	3.6	14.3	35.7	39.3	7.1

During the innovation process, 40.7% of the teachers made changes in the project objectives. Thus, 46.4% introduced new objectives when they began the innovation.

e) Significance of the projects. Innovation projects did not seem to favor exchanges with colleagues from other universities in a substantial way (see Table VIII), although they did introduce the teacher to a dynamic that endured over time (as noted by more than 53% of the teachers), and this was transferred to neighboring areas.

Table VIII. Objectives and communication of the results

Items	Response options				
	1	2	3	4	5
The objectives, once initiated, have been modified.	11.1	11.1	37.0	37.0	3.7
New objectives have been included.	14.3	10.7	28.6	46.4	
They have permitted exchanges with colleagues.	18.5	18.5	22.2	25.9	14.8
The innovations continue over time.	3.8	11.5	30.8	34.6	19.2
The innovations are transferred to other settings.	3.8	15.4	30.8	42.3	7.7

f) Personal benefits. The majority of the teachers considered that with their innovation projects they provided a service to society, while they made a relevant contribution to the corresponding area of knowledge, which required an update on issues of evaluation by 44.8% of the participants. Innovation among teachers encouraged the sense of autonomy and the development of self-criticism (see Table IX).

Table IX. Personal and social impact

Items	Response options				
	1	2	3	4	5
I am rendering a service to society.			37.9	27.6	34.5
I am making relevant contributions to the area.			39.3	25.0	32.1
I have needed to update myself in evaluation.	3.6	17.2	31.0	24.1	20.7
I feel more independent.	3.7	11.1	33.3	25.9	25.9
I have increased my critical sense.			25.0	53.6	21.4

3.3. Comparison among teachers

To identify possible differences between teachers who participated in innovation projects and those who did not, we chose to compare the means in the different questions. For this, we used a significance level of 0.05. Despite its being the usual procedure in this type of investigations, we should recognize that it is not rigorously exact in accordance with the nature of the data (ordinals), and therefore the results of this analysis should be taken only as a guide.

The teachers showed differences in interpersonal relationships with colleagues, inducing a stronger collaboration in carrying out tasks, as shown in Table X.

Table X. Differences of significant means between innovative and non-innovative teachers

Setting – Item	t	g. l.	p
• Concerning the students			
They come to tutorial sessions more regularly.	2.448	80	0.017
• Concerning the teachers			
I develop more tasks in collaboration with my colleagues.	2.582	76	0.012
• Concerning the use of teaching resources			
I use a computer in my classes.	2.652	66	0.010
I use videos in my classes.	3.809	98	0.000
• Concerning research aids			
Degree to which I participate in them	3.473	84	0.001
• Concerning programming changes			
I have improved the student-evaluation system.	3.194	101	0.002
• The changes in my teaching are due to:			
Courses, workshops, training seminars.	2.495	71	0.015
Participation in innovation projects.	5.770	65	0.000

The teachers improved in their use of computer and video in their classes. Other changes in favor of taking part in innovation projects were experienced in the highest degree of participation in research aids and improvements in evaluation procedures. Similarly, innovative teachers perceived that the changes in their work have, as a conspicuous cause, their participation in the courses, workshops, seminars and projects of innovation (Table IX).

IV. Discussion

Reading the results obtained shows that changes in university teaching are made quickly, with more speed than one might expect. This conclusion follows the observation that teachers (both participants and nonparticipants in innovations) have experienced remarkable changes over the past three years. Improvement in

communication has been shown between teachers and students, as well as the relationship between the two groups, although this has not carried over to the tutorials. Likewise, the teachers considered more and more the teaching-learning processes in making evaluations.

From a systemic perspective, the improvements experienced by different teachers involved in innovation projects, act as a stimulus for improvement within the complex network of interactions in which the university operates. Considering that the institution is organized as a system of units and relationships, it is to be hoped that the action initiated by these teachers will spread to other units, promoting the development of the institution. A sample of this interaction between subsystems was observed from the beginning, for example, in the improvement of relations between fellow teachers. Another advance directly experienced was a growing acquaintance with teaching resources provided by the school, such as the operation of the magazine and newspaper archive, the library and the overhead projector. On the other hand, the use of video and computers for classes did not increase.

Changes in the teaching program, although moderate, were experienced in the evaluation process, management of time in the thematic units, and updating of the bibliography. Finally, these changes seem to originate (according to the data collected) in the teacher's own initiative as well as coming about as the result of experience.

The participants in the innovation projects present characteristics different from those of the other surveyees, and have a specific profile. Comparing these with the teachers not participating in the projects, the first present the following characteristics to a greater degree:

- They receive a greater number of students in tutoring sessions.
- They establish collaborations with colleagues for various tasks.
- They use video and computers to develop their classes.
- They participate in public invitations to support research and teaching.
- They improve the evaluation process.
- They attribute the reason for the improvements seen to several factors, among them, courses, workshops and training projects in which they have participated.

To these characteristics extracted from the research presented, we would have to add another, coming out of common sense. Any person who participates in such projects, which require a high degree of commitment, is someone who puts into practice his or her best skills as an entrepreneur, has concern for improvement, continually reflects on his or her own work and desires continuous improvement.

Thus, the study has met the basic objectives: to find out the changes experienced by teachers in recent years; to differentiate between teachers who participate and those who do not participate in the projects, and to establish a profile of

participating teachers based precisely on the differences with respect to the rest of the teachers. Two main conclusions, previously noted, can be drawn from all this.

- a) Changes are really *inherent* in the university.
- b) Innovation projects accelerate these changes, initiated and guided in a pre-determined direction (for the purposes of the project).

Therefore, as deliberate and planned actions, innovations act as catalysts for change, while determining its essence, i.e., the meaning it must adopt.

These results provide promising lines of action, especially at a time like the present, during the full development of the new university reform. Innovation not only encourages improvement, but also allows education to advance in a reasonable time. This research, therefore, is not closed; there are diverse lines to be continued. Among others:

- To increase the sample and spread it to other universities.
- To improve the instrument.
- To enhance the design with ethnographic methodologies.
- To use processes for evaluating the results so as to contrast teachers' opinions.
- To reflect, so as to incorporate institutional innovation as a tool.
- To identify criteria and indicators that would permit the evaluation of projects.

There are numerous new projects which can continue this work. Despite the results, it presents some improvable points, limiting the generalization of the conclusions drawn. This research is based on a non-random sample, small, but sufficient for the descriptive purposes intended. However, the number of data has not permitted the application of contrast tests consistent with the nature of the information, and has turned to statistics such as the *t test*, which, although it is frequently used in these types of investigations, is not the most appropriate for generalizing the results. Therefore, the conclusions of the comparison between groups should be taken as orientational and provisional, although they fit perfectly with the profiles generated in each of the groups of teachers. On the other hand, the instrument used meets the exploratory objectives. However, it will be necessary, as stated above, to expand the questionnaire further, in an attempt to create a more versatile tool, valid and flexible for different contexts.

It is interesting to emphasize, at this stage of the document, that the instrument should be supplemented with items that attempt to identify whether behind the experiences of each teacher there is a theoretical line coherent and sufficiently argued. In this way, it would be possible to contrast the existence of various models of innovation, as expressed earlier in this article (Domínguez, 2000).

Finally, let us reiterate that this research will have little importance unless there is a follow-up of innovation at the University of Malaga, under the same criteria and indicators presented here (enriched by the suggestions mentioned above), so as to

allow control and analysis of the evolution of the innovation projects and their impact on the academic community.

References

Cebrián, M. (1997). La formación del profesorado universitario en el ámbito docente: Líneas de actuación del ICE de la Universidad de Málaga. *Cuadernos de Información*, 9, 7-10.

De la Torre, S. (1994). *Innovación curricular. Proceso, estrategias y evaluación*. Madrid: Dykinson.

Fullan, M. G. (1996). Turning systemic thinking on its head. *Phi Delta Kappan*, 77 (6), 420-423.

Grau, J. E. (2000). Gestión de innovaciones. In I. Cantón (Coord.), *Evaluación, cambio y calidad en las organizaciones educativas*. Buenos Aires: Fundación para el Desarrollo de los Estudios Cognitivos

Havelock, R. G. & Huberman, A. M. (1980). *Innovación y problemas de la educación*. Paris: UNESCO.

Havelock, R. G. (1969). *Planning for dissemination through dissemination and utilization of knowledge*. Ann Arbor, MI: Center for Research on Utilization of Scientific Knowledge.

Marcelo, C. (1996). La innovación como formación. In Sociedad Española de Pedagogía, *XI Congreso Nacional de Pedagogía. Innovación Pedagógica y Políticas Educativas* (pp. 43-86). San Sebastian: Sociedad Española de Pedagogía-Universidad del País Vasco.

Nichols, A. (1983). *Managing educational innovations*. London: Allen & Unwin.

Shon, D. (1971). *Beyond the stable state*. London: Temple Smith.

Tójar, J. C. (1997). Innovación educativa y desarrollo profesional docente en la Universidad. In J. C. Tójar & R. Manchado (Coords.), *Innovación educativa y formación del profesorado*. Malaga: ICE de la Universidad de Málaga.

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