THE INSTITUTIONAL PERSPECTIVE ON THE USE OF COMMUNICATION TECHNOLOGIES IN PORTUGUESE PUBLIC HIGHER EDUCATION: A RESEARCH PROPOSAL

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Abstract

This paper presents and discusses the research rationale adopted to study the institutional perspective of the Portuguese higher education institutions as far as the use of communication technologies to support education is concerned. The paper presents the research questions, the analysis model, the methodology used and the outline of the data collection instruments developed. Some preliminary results are also presented and the next steps of the research project are outlined.

Keywords: use, communication technology, higher education, institution, Portugal.

1 INTRODUCTION

The effective usage of communication technologies to support educational purposes is an important issue on higher education institutions (HEI). HEI are being challenged by several internal and external factors, including the increasing use of Web 2.0 technologies, the pressure to offer distance education programs, the open educational resources movement, and the need to cope with students holding a new and diverse set of habits about the use of communication technologies.

The use of communication technologies in HEI can be studied under different perspectives. On the doctoral program on Information and Communication in Digital Platforms offered by the Universities of Aveiro and Oporto (Portugal), a research project about the Portuguese reality is underway considering several perspectives. The institutional perspective is the object of this paper.

Research has been published concerning the usage of communication technologies to support educational purposes. Some observe and compare realities from different countries (Armstrong & Franklin, 2008; Collis & Wende, 2002), and others concentrate on a specific country (Minocha, 2009). There are also studies about individual institutions (Heikkilä, Haarala-Muhonen, & Nevgi, 2005; Löfström & Nevgi, 2007). Other issues have been under study, like the use of specific communication technologies (Weiss & Hanson-Baldauf, 2008) and the approaches of teaching and learning that take into account communication technologies (Siemens, 2005; Siemens & Tittenberger, 2009). In the case of Portugal, there are also some published results (Carvalho, Aguiar, Carvalho, & Cabecinhas, 2008; Coutinho, 2008).

The institutional perspective is considered in some projects, which is revealed through subjects such as institutional strategy (Bates, 2000; Boezerooij, 2006; JISC, 2006), teacher training on the use of information and communication technologies (Heikkilä, et al., 2005), security concerns about the institutional use of communication technologies (Gorge, 2007) and the management of digital content (Armstrong & Franklin, 2008; Harley, et al., 2006).

The aim of this study is to describe the Portuguese reality about the institutional perspective on the use of communication technologies in public HEI to support educational purposes. Three main objectives were considered: the first objective is to identify which communication technologies are used; the second objective is to describe the uses identified, aiming to understand the difficulties found by institutional actors, and to show which opportunities and challenges are faced; the knowledge produced achieving the two previous objectives is the base to eventually produce useful recommendations for HEI about the present and future use of communication technologies for educational purposes, which is the third main objective.

For the purpose of this paper, communication technologies are technologies that use the internet as their support platform. The classification used on this project resulted from a collaborative effort done with another researcher (work not yet published). It has considered classifications from other authors (Armstrong & Franklin, 2008; Grodecka, Wild, & Kieslinger, 2009; Hart, 2009) and a synthesis were

made based on them. The result of this effort is a classification with seven categories, which are: virtual learning environment (VLE) / learning management systems (LMS); technologies for publication and share content; technologies for collaboration; social networks; interpersonal communication technologies; content aggregation technologies; and 3D virtual environments. Also for the purpose of this paper, the support of educational activities means all activities that aim to result in learning by students. This project is based on educational activities that use communication technologies.

The conceptual framework of this project is presented on the next section, followed by a description of the methodology used. The activities undergoing are outlined and some very preliminary results are reported.

2   CONCEPTUAL FRAMEWORK

Considering the context of this project and its objective, the general research question is:

How Portuguese HEI use and plan to use communication technologies to support education?

The general research question is divided in six specific research questions concerned with subjects such as institutional strategies, resources and institutional policies, actors introducing communication technologies in HEI, the present *versus* the future use, and the duality between the perceptions of faculty, on one hand, and of staff with institutional responsibilities (SIR) related with the use of communication technologies to support educational activities, on the other hand.

To find answers to the research question, this project approaches the institutional perspective of the use of communication technologies under two main concepts, the "institutional framework" concept and the concept of "use", which are the basis of a model of analysis (Quivy & Campenhoudt, 2005, p. 109). Each concept is viewed under different dimensions and in some cases dimensions are divided in their components. Indicators were stated to every component and/or dimension. Table 1 shows a concise version of the model of analysis, showing their concepts, dimensions and components.

The concept of "institutional framework" is about institutional aspects related with the use of communication technologies to support educational activities. The dimensions of the concept of "institutional framework" are:

- HEI basic characterization: this dimension contributes to know basic data of the Portuguese HEI, like their name, their nature (universitary, polytechnic, military, policial), their dimension and geographic location;

- Strategy: rather than being consensual, strategy is a concept with many definitions and perspectives. Mintzberg describes ten schools of thought (Mintzberg, Ahlstrand, & Lampel, 1998, p. 5) and argues that it is better to present five definitions of strategy rather than just one (Mintzberg, 1987; Mintzberg, et al., 1998, p. 9). Those five definitions reflect different points of view, namely considering strategy as a plan, as a ploy, as a pattern, as a position and as a perspective. These different points of view can be combined, which is useful to understand the strategy of organizations. HEI have been taking into consideration the concept of strategy, sometimes under the planning school of thought (Bates, 2000; Keller, 1983; Rowley, Lujan, & Dolence, 1997). Strategy about the use of communication technologies to support education has been considered (Bates, 2000; Boezerooij, 2006; JISC, 2006; Löfström & Nevgi, 2007; Wende & Beerkens, 1999). The dimension of institutional strategy is very important to understand the institutional approach to the use of communication technologies: does the HEI have a strategy to that use? Is the strategy documented? Do faculty and SIR have similar perceptions about their institutional strategy? Strategy to the use of communication technologies is integrated with the broader and more general institutional strategy? Some more indicators from other dimensions of the model of analysis also contribute to understand the strategy of HEI about the use of communication technologies to support education;

- Institutional resources and policies: to implement a strategy, it is necessary to have resources available and policies to use them. This dimension is divided into several components: financial resources, which are sometimes mentioned as being scarce (Löfström & Nevgi, 2007, p. 322; Orr, Williams, & Pennington, 2009, p. 259); technology resources, being infrastructural and human technical resources; faculty training, which is a subject frequently mentioned (Bates, 2000, p. 98; 2005; Collis & Wende, 2002, p. 223; Heikkilä, et al., 2005, p. 320; Löfström & Nevgi, 2007; Orr, et al., 2009); institutional policies, namely about rules and

conditions of using communication technologies (Criddle; Franklin & Harmelen, 2007; University of Manitoba, 2005), about preservation of digitally generated content, or about the use of open educational resources (OER) (D'Antoni, 2008; Harley, 2008; Vickery & Wunsch-Vincent, 2007), for example; and human (faculty) resources, which is important in terms of incentives, recognition and reward (Collis & Wende, 2002, p. 37; Orr, et al., 2009, p. 261; Stensaker, et al., 2007, p. 424);

- Management: at least two subjects are important to consider in terms of management, being monitoring the use of communication technologies and evaluating that use (Bates, 2000, p. 47; Löfström & Nevgi, 2007, p. 320). If the use is observed, accounted and evaluated, future decisions will be much more strongly supported.

Table 1 – A concise view of the model of analysis: concepts, dimensions and components.

Concept	Dimension	Component
Institutional framework	HEI basic characterization	
	Strategy	
	Institutional resources and policies	Finances
		Technology
		Faculty training
		Institutional policies
		Human resources (faculty)
	Management	Monitorization
		Evaluation
Use	Agent	Faculty
		SIR
	Technology	Introdution of technologies
		Institutionally available technologies
		Technologies not institutionally available
		Learning activities
		Types of teaching/learning
		Time
		Environment
		Impact

The concept of "use" is about the effective use of communication technologies to support education. Specifically, two dimensions of this concept are considered on the model of analysis:

- Agent: on this project, there are two different agents that use or promote the use of communication technologies to support education. Those agents are faculty and SIR. Other authors present a similar approach, like Boezerooij, which considers "instructors", "decision makers" and "support staff" (Boezerooij, 2006, p. 71). Both agents are characterized by several similar indicators, like genre or age. They are also characterized by specific indicators. For instance, the number of years of teaching experience and the scientific domain of teaching are indicators of faculty, and the institutional role is an indicator of SIR;

- Technology: this dimension is about the technologies that are used to support education. It is divided into several components: introduction of technology on the institutional use, to know who are introducing them (faculty, students or SIR); technologies made available (and not made available but used) and/or institutionally promoted to be used; learning activities that use communication technologies, which in this project were the activities proposed by Siemens (Siemens & Tittenberger, 2009, p. 18); the type of teaching/learning activites, to distinguish their formality (OECD, 2007; Tissot, 2008), their mode (presencial, b-learning or distance learning) or the academic level of students involved; time, specially the frequency of use; environment, to know where the use occurs (in classroom or outside classroom); and impact, including indicators such as the level of satisfaction or the perception of the contribute of using communication technologies on educational activities.

3   METHODOLOGY

This is an exploratory research project aiming to understand how Portuguese public HEI are using communication technologies to support educational activities. It is expected that results from this

project would be the basis to plan and implement other projects to respond to more detailed questions and to explain some facts revealed on this project.

The boundaries of the universe under study are well known (Oppenheim, 1992, p. 44). In terms of public Portuguese HEI, there are fifteen university HEI, twenty polytechnic HEI and five military and policial HEI (four are acknowledged as giving university education and one as giving polytechnic education). Seven universities also have polytechnic units.

Descriptive techniques (Carmo & Ferreira, 2008, p. 231; Oppenheim, 1992, p. 38) are used to show how HEI use communication technologies. This project produces quantitative and qualitative data. The first phase of the project is mainly quantitative, and data is collected using an online questionnaire based on the model of analysis presented on the previous section. The results from this questionnaire describe the object under study and give some important topics to explore in subsequent detailed interviews, which are the main object of the second phase of data collection. Documents are also analysed, even if institutional data is rarely publicly available. Data from interviews and documents will be processed using qualitative methods.

The questionnaire has four main parts. The first part includes questions to characterise the participants, like their age or the HEI where they belong. Questions on the second part are about the concept of "institutional framework", and the questions on the third part are about the concept of "use". These two concepts are the main concepts of the conceptual framework of the project presented on the previous section. The last part includes concluding questions, like the way participants have known about the questionnaire and an open question to participants let comments and suggestions. This is followed by the "submission" button.

The online questionnaire was prepared and tested during 2010. Two versions were designed, one for faculty and another one for SIR, like rectors, deans, e-learning units staff and similar institutional roles. The subjects are the same on both versions. They are very similar in terms of content, but the questions were written considering different institutional roles. In some cases, the same person is qualified with both institutional roles, and so it is allowed to contribute accordingly, answering to the two different versions of the questionnaire. However SIR are difficult to find and to account, the number of teachers is reasonable known. This number varies each year, but statistics from the Portuguese Government shows that the average number of teachers in the public HEI between 2001 and 2008 is 25.027 (GPEARI - Gabinete de Planeamento, 2010). It also shows that the number of teachers in 2008 (24.728), the last year with available data, is 0,988% of the average between 2001 and 2008. Then, for the purpose of this paper, the official data from 2008 will be considered.

Nine teachers participated on the first tests of the questionnaire. These tests consisted on filling the questionnaire (paper) on the presence of the researcher. That presence was passive, and the researcher did not answer any question asked by participants. The objective of his presence is to eventually take notes and to interview each participant immediately after the questionnaire is completed. Those unstructured interviews were sound-recorded and the main question of them was: "What can you tell me that can help to improve this questionnaire?".

Data from these first nine tests and interviews were processed using content analysis (Carmo & Ferreira, 2008, p. 265; Cohen, Manion, & Morrison, 2007, p. 475). The unit of analysis was the subject mentioned by the interviewed. Eight codes were considered, such as "interpretation" when difficulties to interpret and understand a question was mentioned, "length" to situations where participants mentioned something about the time needed to complete the questionnaire, or "scale" for every case when participants complain about the scales of measure used in the questionnaire. The analysis of these tests was very useful and contributed in several ways to the improvement of the questionnaire. The more important contribution was about the scale used in a significant number of questions. It was used a rating scale ranging from "completely false" to "completely true" to ask the perception of participants on questions about institutional strategy to the use of communication technologies, or the resources made available to that use, for instance. The fact is that teachers felt that scale is very hard and demands knowledge they sometimes are not completely sure about. However, they seem able to answer correctly if the rating scale was about agreement/disagreement.

Change this scale had consequences: the answers would not be so objective with the "agreement" scale but, at the same time, participants revealed to be uncomfortable with the previous one. Also adds to the "agreement" scale" the fact that the objective of the study is to understand the perceptions of the participants about the subjects questioned, which are not always based on an absolute objective knowledge of reality. The main improvement on the questionnaire was then the change of the rating scale ranging from "completely false" to "completely true" to a rating scale ranging from

"totally disagree" to "totally agree". Several questions were rephrased accordingly to the new scale adopted. Some cautions were taken on the adoption of this scale, such as assuring its uni-dimensionality and its linearity (Oppenheim, 1992, p. 187).

Another important point was raised by those nine tests. In four out of nine answers to the questionnaire mentions were made about the length and to the time needed to answer it completely. Those mentions referred to the fact that the questionnaire was long. Analysing the data available, one participant took between ten and twenty minutes to complete the questionnaire, five participants needed between twenty and thirty minutes and three participants spent more than thirty minutes. It was then considered the possibility to change the questionnaire decreasing the number of questions. However, every attempt done for that purpose resulted in an unbalanced set of questions. Also, diminishing the number of questions would not give the data necessary to answer the research questions of the project. It was then decided to take the risk: the number of final participants on the questionnaire could be lower than if the questionnaire has considerably fewer questions.

The questionnaire was then re-tested to assure that the main problems previously identified were positively corrected. Of great importance was the need to confirm that the change of the rating scale was successful. The second phase of tests involved two teachers and two SIR testing the two versions of the questionnaire. Participants on both phases were different. The procedures used on these tests were similar to the procedures used on the first phase of tests. Participants were also interviewed after filling the questionnaire and that data was codified with the same codes as on the first sets of tests.

The problems with the scales of measurement detected on the first phase seem to be rightly corrected. On the second phase of tests, no problems were reported concerning the "agreement" scale. No significant problems were identified on the second phase of tests, so the improvement on the questionnaire was in minor points.

The questionnaire was then distributed among all the Portuguese public HEI. This process started in late October 2010. Several approaches were used to reach the potential participants: contacting directly the HEI, using social networks and personal contacts. Finally, direct emailing to faculty was a solution to reach teachers in HEI where the number of answers was too low.

Semi-structured interviews to selected SIR are the next phase of data collection. This qualitative data will be processed using content analysis. Then, stats results from the questionnaire will be crossed with results from interviews and documents.

4   WORK-IN-PROGRESS

The project has now three main activities in progress. First, the questionnaire is still open to answer, after several efforts to reach the largest possible number of potential participants. From now on (mid January 2011) it will still be open for about two more weeks, even if it is not expected a significant increase in the response rate.

Second, interviews to SIR are being planned and prepared. Subjects like the number of interviews to be carried out and their distribution among the HEI are under consideration.

The third major activity is data processing, firstly of data from questionnaires and secondly of data from the interviews after they are done.

Some data from the questionnaires can already be presented. However, it should be considered that this is just a very preliminary disclosure, based on data collected until December 30th, 2010.

Because the questionnaire is still open to participation, data was not yet cleaned from abnormal cases and it is not final. It will be necessary to exclude cases with a limited number of answers, check for questionnaires in which the answer is always the same, and other situations. The data used to obtain the results that follows are from faculty. For this purpose, they were solely considered finished answers to the questionnaire (these are easy to distinguish because there is a button at the end to submit the questionnaire).

At December 30th, 2010, 696 teachers have finished the questionnaire, which represents 2,8% of the universe under study (24.728). As this is a national project, it is important to know if those answers are well distributed in different aspects. Participants in the study includes faculty from almost all of the scientific teaching areas considered ("Portaria nº 256/2006 de 16 de Março (CNAEF)," 2005). From the 24 categories available to choose from, just 3 had no answers, namely "personal services",

"security services" and "transport services". The most represented categories were "health", with 13,1%, "engineering and similar techniques", with 12,8%, and "business sciences", with 11,9%.

Almost all the Portuguese public HEI are represented on the data already available. There are just 4 HEI without any answer at the moment. These 4 HEI are all of military or security nature. All other HEI have faculty that participated, from all over the Portuguese country.

Genre is an important variable, and the data shows a balanced participation on the project. Fig. 1 shows that there were more female than male participating, with a short leading difference to women, with 52% against 48% to men. However, in the official data of the universe under study (GPEARI - Gabinete de Planeamento, 2010), the presence of men is more expressive, with 57% out of total, in contrast with 43% of women. These numbers suggest that, in the project's participants, women were more willing to participate answering the questionnaire than men.

Genre

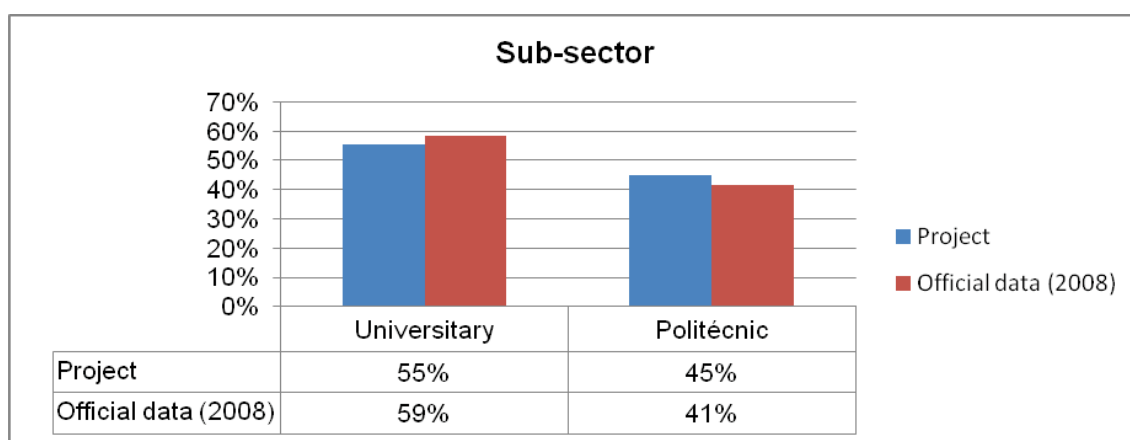|	Male	Female
Project	48%	52%
Official data (2008)	57%	43%
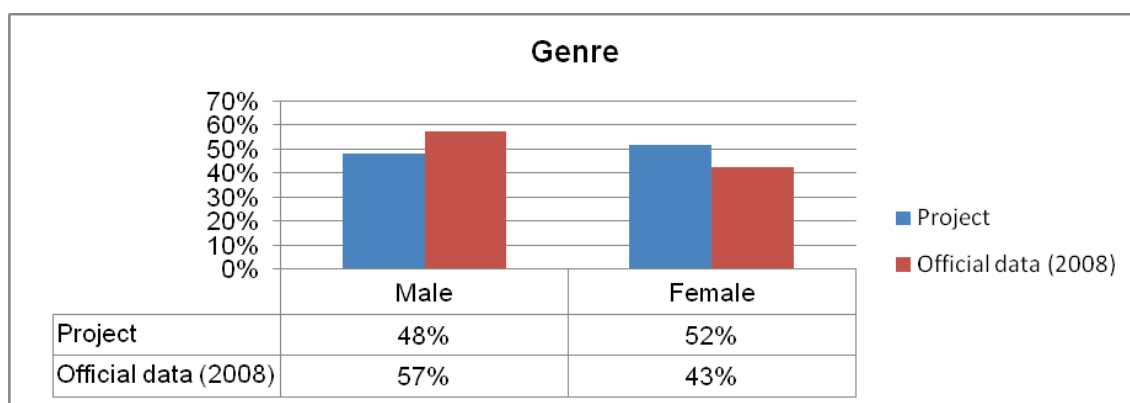
Figure 1 – Participants in the project that finished answering the questionnaire compared with official data (2008): 690 participants that answered the question of genre were considered on this comparison.

Age of participants is another important variable to this project. On Fig. 2 it can be observed that the age of participants in the project is very likely the age of the members of the universe under study. In fact, there are great similarities, with minor differences.

A third variable of analysis is the sub-sector of higher education that faculty belongs to. In Portugal there are two higher education sub-sectors, namely the universitary sub-sector and the polytechnic sub-sector. In some cases, an HEI have units from both sub-systems. The University of Aveiro is such an example: it has several universitary units and also four polytechnic units. The questionnaire allowed each teacher to specifically identify his own HEI and sub-sector. Fig. 3 compares the teachers' answers with official data. It can be observed that the differences between the two sub-systems are larger in the official data than on the project's data. Most answers in any of these two series are from the universitary sub-sector. The differences are about 4% in each sub-sector.

Age

|	<30	30-39	40-49	50-59	>=60
Project	6%	32%	35%	22%	5%
Official data (2008)	6%	28%	35%	24%	7%
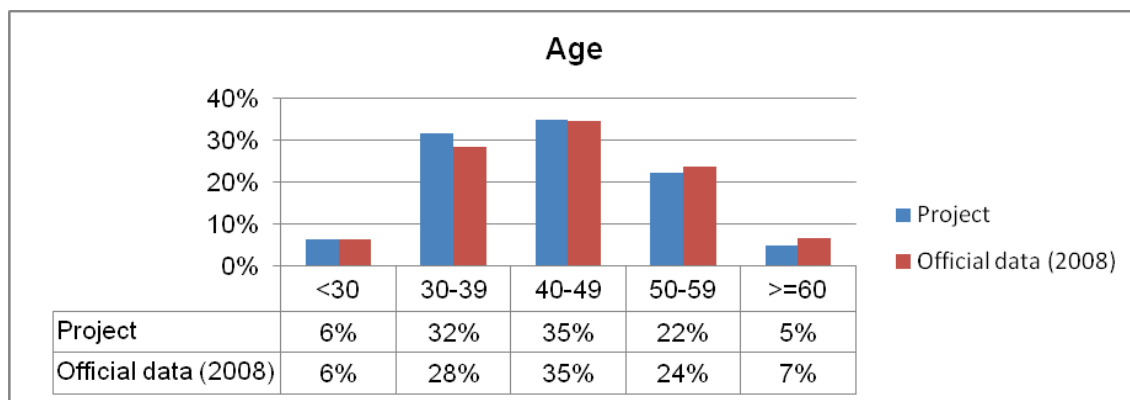
Figure 2 - Participants in the project that finished answering the questionnaire compared with official data (2008): 694 participants that answered the question about age were considered on this comparison.

Sub-sector

	Universitary	Politécnic
Project	55%	45%
Official data (2008)	59%	41%

Figure 3 - Participants in the project that finished answering the questionnaire compared with official data (2008). 684 participants that identified their HEI were considered on this comparison.

Another variable is the number of years of teaching experience. As it is shown in Fig. 4, the leading interval is the 10-19 years of experience, with important levels of participation from teachers under 10 years of experience and from teachers between 20 and 29 years of experience. The higher intervals have shown lower rates of response.

Number of years of teacher experience

	<10	10-19	20-29	30-39	>40	no answer
%	29,2%	38,2%	23,0%	8,3%	1,0%	0,3%
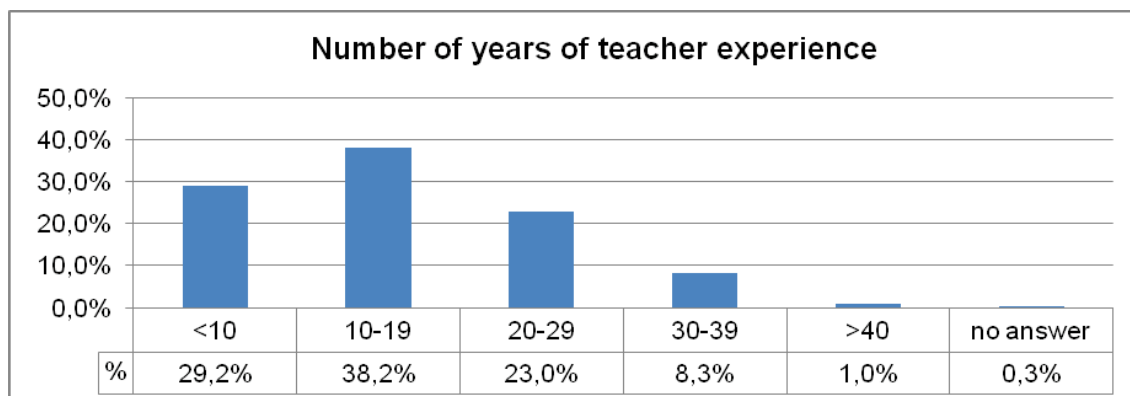
Figure 4 - Participants in the project that finished answering the questionnaire. 690 participants answered the question about the number of years of teacher experience.

5 CONCLUDING REMARKS

As this is a research-in-progress paper, there are not yet general and sound conclusions from this project. However, some concluding remarks can be left:

- The testing process of questionnaire was very helpful to improve it, especially regarding the rating scale used;

- The spreading process of questionnaire was very hard, and it is now evident how difficult is it to have a large number of participants answering the questionnaire. This process was done with another researcher, and a detailed document is now being prepared describing all the process and its results;

- Preliminary data and results suggest that the questionnaire was reasonably distributed on the universe under study. There are answers from almost all the HEI, and variables like genre, age and sub-sector are in line with official data of the universe under study. There is also a good representation of scientific areas of teaching, with answers from almost all of categories considered.

On the next months data will be processed and detailed results will be disclosed.

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