Full Length Research Paper

Educational formats, student profiles and academic results

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Abstract

This work analyzes the three educational formats: face-to-face, blended-learning (b-learning) and on-line, used in the Master's in Public Health program of the National Institute of Public Health (NIPH) between 2006 and 2009. These formats were compared in terms of the student profile, academic results and students' satisfaction. Methodologically, the study combined quantitative and qualitative techniques for data collection and analysis. Results show the existence of a different type of student for each educational format. On-line students are usually doctors who are more than 40 years old, in high executive positions. Those in the face-to-face format are mostly people who are under 30 years of age, who just received their bachelor's degree and their entering careers broaden to the health sciences and professions. Those in the b-learning format are in intermediate age groups (between 30 and 40) and are the most multidisciplinary group although health professions are still the majority. The academic results also show differences. The best grades are mostly obtained in the b-learning format, in spite of the fact that no significant differences were found. The levels of satisfaction with the teaching process are greater in the face-to-face and b-learning formats, than with on-line.

Keywords: Educational formats, Student profiles, Students of public health.

INTRODUCTION

Different higher education institutions in the world now offer training programs in diverse educational formats, such as face-to-face, b-learning and on-line. The rapid development of information and communication technologies (ICTs) has provided new learning opportunities for on-line education and encouraged the development of alternatives to the face-to-face format. This last one, as is well known, focuses on learning processes centered on the physical classroom. The on-line format allows the students to participate in online activities, using computers, cell phones and other technological devices. Some higher education institutions offer b-learning programs, which require the students to attend face-to-face activities during the week-end or during intensive periods and online activities are often incorporated during the week.

A person's decision to obtain a post-graduate degree is affected by a series of factors, which include the educational level, marital status, family situation - including the family's decision to enter the program - availability of childcare, income level, housing situation, location, access to technological resources, age, and interest in professional goals, among other factors. These factors demand that, besides the full-time programs, the higher education institutions develop on-line alternatives and other formats to deliver programs to allow for professional growth and personal demands of students. The on-line and b-learning programs are becoming more and more popular, since they provide a flexible academic process for students with different learning styles, work needs and geographic locations.

E-learning (electronic learning) refers to learning through ICTs. E-learning allows students to complete synchronous activities (carried out in real time) or asynchronous (not in to real time). E-learning offers flexibility for the students who, for some reason, cannot participate in face-to-face programs; nevertheless, there

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are limitations such as bandwidth restrictions, access to equipment, personal motivation, degree of satisfaction with respect to the interactions with classmates, professors and tutors, among other factors (Kinuthis et al 2008; Montenegro, 2008) . B-learning (blended learning) refers to multi-modal learning, which incorporates activities in the physical classroom and on-line activities. Debate exists as to the exact meaning of b-learning, since there is no broadly accepted definition and the educational institutions use several terms to describe this format (such as mixed and hybrid) (Picciano, 2009). Some definitions of b-learnig are the following: 1) the use of the media in a traditional classroom or in the distance learning environment; 2) any combination of media that supports learning, independently of the combination of synchronous and asynchronous media; and 3) courses where online activities substitute classroom activities (E-learning Guild Handbook on Synchronous e-Learning, 2007). E-learning and b-learning are well designed formats that stimulate students to build their own learning processes, since activities are designed according to style, level and learning speed. The use of multiple formats allows students to experiment with the learning environments in a familiar way, while experiencing the challenge of learning in a different manner. Although there is no precise and generally accepted definition of b-learning, together with the scarce systematic research available on this format (Picciano, 2009), studies of b-learning programs have shown much success.

The National Institute of Public Health (NIPH) offers a master's program in public health in three formats: full-time, part-time and on-line. The full-time program uses the face-to-face format. The part-time uses b-learning: face-to-face on weekends and on-line during the week. The on-line program uses e-learning and requires the students to carry out synchronous and asynchronous activities. The three programs use a pedagogical model that is based on competencies and the students of the different concentration areas of the master's program must complete a core curriculum.

The main objective of this research is to analyze the possible associations among student profile, educational formats, academic results, and students' satisfaction.

MATERIAL AND METHODS

A descriptive study was carried out, using quantitative and qualitative methods for the collection of information and for its analysis.Thus, primary and secondary information sources were used.

Data bases were used for students in the Master's in Public Health Program, belonging to the 2006-2009 generations of the Academic Secretariat at the NIPH, in all the formats (face-to-face, b-learning, on-line). These have information on variables pertaining to the students'

personal profile, their grades and the evaluation of the teachers' performance. The data bases were analyzed using descriptive statistics (frequency tables and percentages) and the Multiple Correspondence Factor Analysis (MCFA) was also used to find out if relationships existed between the variables and the degree of dependence between them. This method allowed us to discover affinities between the responses, that is, the multiple correspondence factor analysis extracted the common characteristics of the 'responses' to the questions (variables) and included them in factors that summarized the degree of connection between them.

Later, a Cluster Analysis was done, to know the size or percentage of the groups of individuals with similar characteristics and which matched the AFCM results. The computer programs used for data analysis were the SPSS® (Statistical Package for the Social Sciences) and the SPADn® (System for data analysis developed by the Centre International de Statistique et d'Informatique Appliquées).

To go deeper into some of the points of the study, semi-structured interviews were carried out (primary sources). The sample selection was done by convenience and the number of interviews was decided according to the theoretical saturation criterion (Bertaux, 1993). Typical and extreme student cases were taken, by format. The inclusion criterion for the cases was the correspondence of student characteristics, selected with the factorial profile which turned out to be associated with the educational format. The number of interviewed students was six per educational format, that is, a total of 18 interviews. An interview guide was developed and the results were processed in a qualitative manner, using matrixes which allowed for the systematization and classification of information from which categories were developed to be analyzed. The interpretation of the information was done using inductive analysis through basic elements of the theory corresponding to the method proposed by Glaser and Strauss (Glaser et al, 1967).

To establish the level of student satisfaction with the teaching process, data bases were used from the Evaluation of Teachers' Performance program. This program evaluates teachers' work in the different didactic units of the graduate programs, including the following themes: planning the didactic unit, knowledge of the subject, teaching-learning strategies, aspects of group leadership and evaluation of learning. It also has information on whether or not the student would recommend the course, if he/she would recommend the contents and whether or not the guest professors enriched the course.

Sample characteristics

The study population was formed by all the students who

entered the Master's in Public Health program offered by the NIPH, in any of the three educational formats (face-to-face, b-learning and on-line), during three generations, 2006 to 2009. Data from 389 students was used: 98 face-to-face (25%), 119 b-learning (31%) and 172 on-line (44%).

With respect to the concentration area of the study program, the sample distribution was as follows: 36.5% general public health, 23.1% health administration, 13.6% epidemiology, 11.3% the social sciences, 7.7% health prevention, 3.1% environmental health, 2.8% nutrition and 1.8% biostatistics.

To explore academic achievement, quantitative grades were used from four core courses of the Master's in Public Health: biostatistics, epidemiology, quantitative methods and social sciences.

RESULTS

The analyses show different profiles associated to the educational format. The teaching format (face-to-face, b-learning or on-line) was the variable that determined the characteristics of these profiles.

The first group of students is the one who studies under the face-to-face format. In general, it presents the following characteristics:

- Under 30 years old
- Single
- Childless
- From the health sciences, humanistic careers, and health-related fields
- Recently graduated
- Entered the program freely; his/her candidacy is not backed by an institution
- Gets grades between 9 and 10 (in a scale 1-10)
- Grades teachers' performance as satisfactory

The second group of students is the one who studies under the on-line format. The analyses show that this profile is opposite to the one of the students in the face-to-face format. It has the following characteristics:

- Over 40 years old
- More than two children
- Mostly doctors or health professionals, with an executive position
- Entered the program through a health institution that backs him/her and pays for his/her tuition.
- Gets grades between 8 and 9 (in a scale 1-10)
- Does not come from the country's capital.
- Is highly critical of teachers' performance.

The third group of students is the one that has followed a program under the b-learning format. It has the following characteristics:

- 30 - 39 years old
- Only one child

- Health professionals and other public health related areas, in a technical position.
- Entered the program freely; is not backed by an institution
- Gets grades between 9.5 and 10 (in a scale 1-10)
- Evaluates teachers' performance as satisfactory

As seen, there are profiles that are very defined: at the extremes are the face-to-face and the on-line formats, and at the center, the b-learning student.

Face-to-face students are the youngest, without prior graduate studies and come from health related backgrounds. They have satisfactory academic results (between 9 and 10 on a 1-10 scale) and they also evaluate the teaching process satisfactorily.

In opposition, the on-line students are older, have a bachelor's degree mainly in medicine and have greater responsibilities, since they are working in executive positions. They have less satisfactory academic results (an average between 8 and 9) and are more critical of the teaching process.

The students in the b-learning format are of ages between both extremes, are the most multidisciplinary group due to their bachelors' degrees in diverse areas not related with health professions although there is a great representation of areas of health sciences. They are currently working in operative positions and are the ones who get the best academic results and better evaluate the teaching process.

Another result is with respect to academic achievement and institutional support. The highest achievement is associated with students who pay for their studies and are not backed by an institution.

In the information analysis, it is noteworthy that there is an absence of the gender variable among the questions determining the characteristics of the student profiles. This is a positive element which speaks favorably of the gender coverage in the NIPH academic programs, since 68% of the students in these generations are women. Nevertheless, we need to go deeper into this theme, since these results could also be related to the feminization process of medical education in the country (Nigenda et al, 2010).

As anticipated, the geographic variable is associated with the on-line format. Students in this format generally do not come from the country's capital but rather there is a good representation of all the states. This format is the most inclusive in terms of students origin and location.

According to the interviews, the format that is preferred by the students depends on their profile. For this reason, opinions were divided: for the face-to-face student, it is best to be in a classroom setting, with a professor in a traditional way; for the on-line student, the communication established with the teacher is valid, through a synchronous session and electronic media; and for the b-learning students, they have both components, the face-to-face and the on-line component,

so this format is ideal for them and even for students from the other formats, without finding weaknesses – perhaps for this reason, their achievement is the highest.

With respect to the advantages and disadvantages of the three formats, they point out that on-line offers the possibility of continuing with their work, caring for their family and not having to move to the different facilities where the program is offered. They also refer to the importance of interacting with their classmates, which they see as a disadvantage of this format, while highlighting the advantage of having flexible schedules to do homeworks and readings (this is one of the disadvantages of the face-to-face format – the limited and vertical times in which activities must be done); with respect to the b-learning format, they do not mention disadvantages.

With respect to academic performance, they state that professional experience plays an important role, as well as constant updating, and in the case of the b-learning and on-line formats, students have both, besides having work-related responsibilities, which reflect on their fulfillment of schoolwork. For this reason, they have better grades. Face-to-face students are mostly recently graduated from their bachelors' programs, do not have work experience or have very little, so that their performance is more limited; nevertheless, they work at their programs full-time and their youth makes them attach less value to grades.

Finally, it is important to point out that students of the three formats state being satisfied with the educational methodology and its pedagogical principles, but they demand greater feedback on their homework and other schoolwork. They also ask for greater communication with professor-researchers and not to have their interaction limited to the classroom (on-line or face-to-face), since they consider that informal interaction also trains the student.

DISCUSSION AND CONCLUSIONS

Recent studies have compared the efficacy of the different educational formats. A systematic revision of the literature, carried out by the U.S. Department of Education, compared the learning results of the different environments – on-line and face-to-face. It found that, in general, students perform better in online learning environments, than in a classroom (Means et al, 2009). Other studies suggest that certain educational formats are more adequate for certain learning styles; for example, some studies have found that students who are less inclined to conventional academic learning (external regulation), are more benefitted by the tools of electronic learning (Dirk et al, 2009). Others say that the educational format is not the most important factor to determine a program's success, but the design of the content with respect to the format, proposed learning objectives and other factors affecting the student's experience (Ramírez, 2007).

It is also important to consider the reasons for which the students select face-to-face, on-line or b-learning programs. There is no consensus with respect to this theme. Some studies have found that the students without work experience often prefer the face-to-face programs, while students who work are enormously benefitted by the online programs, due to family and professional demands (Kokol et al, 2006). On the contrary, other studies found that the students prefer the b-learning format to face-to-face or completely online programs, and they have the same levels of academic success in the three formats (Berenson et al, 2008). Since the students' needs continue to change, the higher education institutions must continuously examine the efficacy of the different educational formats.

Although this study did not evaluate the efficacy of the educational formats, they were considered as proxy variables to explore the theme. Some results coincide with what was reported in the literature, for example, concerning the selection of the format according to the level of the studies and work status: those who were recently graduated and have no work connection, select the face-to-face format, while people with a work connection, select another type of educational format that adjusts to their schedule.

An important reflection about b-learning format in teaching: Perhaps its success nowadays is due to the fact that even our students are not yet digital natives, but digital immigrants. Perhaps we're not yet completely prepared to substitute social face-to-face relationships with on-line alternatives in the learning process. What is true is that the possibilities that open with education by competencies and with innovative educational formats are infinite and, no doubt, will result in the training of more complete, integral and capable professionals.

This study documents the fact that, although we have different behavioral profiles, there are no great differences in results, in terms of academic results, between the formats. Many of the competencies that must be acquired depend on the instructional design of the course and the ability of the professor to promote learning environments. The quality of professors, tutors, follow-up activities, the composition of groups, the production of teaching tools, among other things, depend directly on the institutions, their organization and infrastructure. For all of this, we consider that the determining factor in the quality of teaching is the educational model and not the format, be it face-to-face or on-line. And in this sense, education by competencies turns into the ideal model for training health professionals that the country needs.

We coincide with what has been expressed by experts that assure that the future of education is in the

multimodal format: much individual or collaborative work with Internet tools –from master classes on the web to work materials or exercises – face-to-face seminars and individual tutoring sessions, online or in person (García et al, 2009).

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