Best academic practices in students of the Plan of Combined Studies in Medicine

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Abstract

Since 2011, students of the Faculty of Medicine of the National Autonomous University of Mexico with an outstanding academic record and a vocation for biomedical, socio-medical and clinical research, have the opportunity to participate in the Plan of Combined Studies in Medicine (PECEM) which allows to study medicine and a doctorate in medicine in a period of eight years. The purpose of this study is to examine the best academic, institutional and student practices in PECEM, to describe and transfer them to other educational contexts in the health area. An exploratory qualitative study with a phenomenological approach was carried out in PECEM students using the technique of focus groups (FG). A total of 52 students participated from the 6 generations of PECEM. Data from 6 FG was analyzed and best practices were identified in 3 dimensions: 1) institutional context, 2) internal dynamics of the group, and 3) self-regulation.

Keywords: Best academic practices, Focus groups, Qualitative method, Doctoral program, Undergraduate Medical Education

Introduction

The Faculty of Medicine of the UNAM is a public institution committed to form human resources in the health area, being a bachelor's degree as medical surgeons among its academic offerings for more than 100 years. PECEM was launched in 2011 and includes studies to obtain the mentioned bachelor's degree and the degree of Doctor in Medicine. The minimum requirements to enter the program in the third semester (second year) of the undergraduate
studies are: outstanding academic record (minimum GPA of 9 in a scale of 0 to 10), no failed subjects during the first year of studies and a vocation for research.

The aim of the program is that students through a single curriculum that lasts 8 to 9 years, acquire experience in research by participating in 7 semi-annual rotations with different research mentors that comply with the quality requirements established by the program: work in UNAM or in any of the National Institutes of Health in Mexico, and are involved in research and academic activities. Parallel to the medicine career subjects, PECEM students attend the following program-specific academic activities (electives) parallel to the faculty program of medicine [see figure 1]:

- Scientific research methodology
- Discussion of scientific articles
- Ethics
- Design and elaboration of a research protocol

The essential is to use the results of scientific research as a basis for medical practice (translational medicine). This postgraduate training, both in medicine and in research, has proven to produce trained professionals who position themselves in their workplace to successfully influence innovation in health services (Facultad de Medicina, 2011; Zhou, Savage, & Eisenberg, 2016).

To meet the demands and requirements of the PECEM, students can use academic practices to flexibly and creatively participate in this high complex scenario and achieve good academic performance. "Best practices" are described as the elements that have been shown to contribute to the achievement of the pedagogical goals in a successful manner. They are a set of actions that lead to excellent results in a specific context and are expected to work similarly in comparable environments. Best practices depend on multiple factors, examples of variables that can influence the student's performance are: the objectives to be achieved, the academic and social environment, and institutional and personal pedagogical issues (Spann, 1997; World Health Organization, 2008).

In the United States, a study that explored best practices included 6 samples of 911 men and women from 19 bachelor's degrees, 27 master's degrees and 29 doctoral degrees. They identified practices in the students, being the main indicators: faculty-student contact, active learning and cooperation among students (Kuh, Pace, & Vesper, 1997). Currently, most of the literature related to best practices in students in the field of health is centred in virtual environments; nonetheless, they share with the classroom experience characteristics such as self-control, ability to auto-motivate, solve problems, collaborative work, responsibility in learning and critical thinking (Pinchevsky-Font & Dunbar, 2015).

Navarro's (2003) perspective was recapitulated to explain the academic performance as a construct that approximates quantitatively and qualitatively the profile of skills, knowledge, attitudes and values developed by the student in the teaching-learning process. Academic performance is an intricate web of cognitive articulations that include the analysis of the variables related to social skills and self-control. This is closely linked to the evaluations of the academic programs, and considers the results of these to measure the learning achieved by the student. Furthermore, it identifies what students learn and their abilities and predisposition regarding educational stimuli. Many factors affect performance, among them, the complexity of the contents, the pedagogical capacity of the teacher, the academic demand and the commitment of the student.

The PECEM program implies a greater academic demand on the students than the bachelor's degree by itself, since they simultaneously carry out scientific research and other academic activities; despite this the PECEM students show a higher academic performance than those who only study the bachelor's degree. Proof of this is that students
who do not belong to the program show a high failure rate; in 2015, 54% of students failed anatomy and 42% biochemistry and molecular biology. In the second year, the subject with the highest failure rate was physiology being around 60% between 2008 and 2015 (Facultad de Medicina, 2015). Therefore, to explore best institutional and student academic practices of PECEM, will surely allow transferring them to other contexts of training in health. The questions that guided the study were:

1. What practices of PECEM students favour good academic performance in the Faculty of Medicine?
2. What characteristics of group interactions in PECEM students influence their academic performance?

**Method**

This paper presents a qualitative exploratory method with a phenomenological approach that emphasizes the experience of the people under study. The focus group (FG) technique was used; group conversations were conducted in a comfortable and permissive environment so that participants could express themselves freely (Krueger & Casey, 2000). The groups were designed to obtain the opinions and experiences of 6 generations of PECEM students with respect to the academic practices they use to stay in the program.

The PECEM coordination invited the students of the program to participate voluntarily in the FG. All sessions were carried out at the Secretary of Medical Education of the Faculty of Medicine, UNAM. The objective of the group interview was explained at the beginning of each session. Also, their consent was requested to record the sessions and it was made explicit that their participation was voluntary and anonymous, without any academic repercussion.

Approximately 12 hours of audio recording of the FGs were transcribed. In order to protect the anonymity, identifiers were created for the testimonies; FG1: the assigned number of the focal group carried out; M / F: male or female; GEN1: the generation; and 010517: the date when it took place carried out.

Each generation of the PECEM comprises between eight and twelve students, with a total of 59 in the six generations, all of them invited to participate voluntarily in the study. The FGs were led by two experienced moderators in the technique. The interview guides were based on the literature on best practices of institutions and postgraduate students in health sciences (Durán & Estay-Niculcar, 2016; World Health Organization, 2008), on the academic characteristics of the PECEM plan and on the results of the Maslach-Burnout-Inventory Student Survey (MBI-SS) to measure burnout in students applied by the coordination of the PECEM. Project was authorized in the ethics and research commissions of the National Autonomous University of Mexico, number FM/DI/151/2016.

**Results and Discussion**

The total population of the PECEM was 59 students at the time of the study, 52 participated in the FGs since seven of them were outside the city (see table 1).

When triangulating the data in a second level of analysis, the following three dimensions were established:

- Institutional context: Referred as the institution's support to students for their training, including the relationship with mentors, the selection of clinical units and research rotations.
- Internal dynamics of the group: referred to the common patterns of interaction between the students of each
generation of PECEM.

- Self-regulation and motivation: it was integrated with the positive beliefs of the students to achieve the proposed goals, the strategies to learn independently based on the planning of time, self-control and self-evaluation, as well as to value and have great interest in knowledge.

Institutional context

Regarding the dimension of the institutional context, it was identified that most of the students felt very close and accessible to those responsible for the program, who supported them in their academic, personal and emotional needs.

[Did you have support from the PECEM staff?] The way in which the doctor (head of the program) personalized the support and the closeness that she always had with us is something that I have not seen in any other program, and part of the fundamental support for us was that she always was very close and very worried... GF4/M/GEN2/250717

[The PECEM staff] ... helps us get groups not too far from our rotations or sometimes when I had a difficult time, it helped me get some extra support. In other words, you are very armoured and very protected and that gives you a lot of strength to be able to move things forward and that life does not come crumble over you GF4/M/GEN2/250717

The closeness with the program staff allowed a safer environment for the students, coupled with it, the laptop, financial support and management to carry out an academic stay abroad was an enormous motivation to continue belonging to PECEM.

I did not have a computer and it helped me a lot to get it GF4/M/GEN2/250717

It impresses me how they paid me for a six-month exchange. In other words, it is something that seems like simple and pure luck. GF4/M/GEN2/250717.

The support and motivation that students receive to perform within the program, in addition to the role of those responsible for PECEM, who are not directly involved in teaching, in most cases, provided confidence for the student to express their concerns and needs to solve arising problems (Arias Gallegos & Muñoz del Carpio Toia, 2016).

Some students pointed out that they sometimes perceived that those responsible for the program had little communication with students and teachers from the subjects in the medicine program, as well as some of the teachers of the elective subjects; this situation has hampered some of their research activities.

There are electives that should be improved because we had a lot of statistics and methodology classes and it really was to repeat and repeat the same thing many times GF4 / M / GEN3 / 240817

I consider that a problem that the program has is the difficulty to choose electives, for example, I wanted to take subjects such as Cancer Genomics, Molecular Biology, etc., but they were only in the morning and as in the morning we are medical students, then it was very complicated to be able to choose a subject that was really part of my interest. GF5/M/GEN1/080617

This situation was rectified with the passage of each generation; sometimes students had the opportunity to choose the elective they wanted, even though little guidance was provided, they had the good fortune to look and find the
elective subject depending on each one’s academic need.

An elective was like some failure, but it was part of a decision to know where you were going and without much guidance, right? GF5/F/GEN1/080617

There was flexibility to take electives and they never told me no [PECEM staff]. GF4/M/GEN2/250717

To continue in the institutional context, another of the variables is the interaction with the mentor within the research stays. The advisor guides students in their projects, supports and guides them in decision-making and gives a positive example as a researcher and as a person. The contact with mentors reinforced their interest in research, encouraged them to set higher goals for their academic training and to apply for an international rotation.

The advisor that I am with now, gave me the opportunity to go to the United States and do a stay focused on brain tumours, that was where I realized that really wanted study brain tumours, how good research was done and focused on brain tumours. GF4/M/GEN2/250717

The most important advisor is that one that’s gives attention to the students and is patient to teach, what I’ve liked the most is that he sits next to you, explains, tells you his experience and guides you in the next experiments ... GF1/M/GEN6/010517

I did very well with my advisor because every day I was with her in the laboratory and she was always open to inquires or suggestions, she gave me time to explain and that’s how you learn, because you start from scratch, I knew absolutely nothing ... GF1/M/GEN6/010517

The benefits that students receive from a committed advisor go beyond participating in publications and collaborating in research, the closeness with he/she provides support, protection, knowledge and advice that gives security to the student in his career as a researcher (Cruz Flores, Chehaybar y Kury, & Abreu, 2011). The opportunity to choose hospital venues was positive for the group dynamic. Having the possibility to do clinical practice and research stay in the same site was a situation that allowed them to adequately comply with the two activities.

In general, the semester we are taking has been a very good complement of the clinical part and the research part. It seems to me that the site shares both parts, I had the opportunity to attend in the afternoons to do research because it was in the same site ... then I was quite comfortable. GF6/F/GEN5/260617

Internal dynamics of the group

The students expressed the desire to have a greater opportunity to interact with other groups, for example, the relation with students who did not belong to the PECEM; during the curricular subjects, other ways of perceiving the medical career and enriched their experience as students were offered.

In the third year, we had classmates who were of the generation. I think it was very valuable to have them because they brought different things to the group, I think they were always very empathetic with us and they asked us what we were doing, and it was nice to be able to tell someone GF3/F/GEN4/230617

Each generation presented different characteristics depending on the circumstances and experiences they lived. Except for the third generation, that was well-defined as lacking communication between their members and poor
group decision making; the other generations (some with a closer interaction of collaboration, than others), were characterized by having the ability to put aside personal differences and unite to make decisions that favoured them as a group. This condition supported them to obtain excellent academic performance and to continue in the program.

Our PECEM generation has been very united we help each other in any problem that one member has. With our colleagues, who are not part of the program, it is a little more complicated because they were limited to the part of the bachelor’s degree. GF1/H/GEN6/010517

We did not get along, we were not the most united [PECEM generation]. But when it came to doing things for the common good, for example, leaving a clinical site, which we did not like, we did it together, that is, we tried to decide together ... GF5/F/GEN1/080617

Much of the success of the groups depends on how decisions are made (Peñuela & Alvarez, 2005). In the PECEM groups we found there was a synergy that allowed a group discourse to appear that led them to make the right decisions which in turn benefited them.

Self-regulation and motivation

In the dimension of self-regulation and motivation, the main attribution to achieve their goals was the desire to learn. The students conceived the requirements to stay in the PECEM as demands that they can achieve because they have the cognitive capacity for it. Learning some techniques to organize and distribute the time (of classes, study, research and family coexistence) and respect the schedules set by them was what allowed students to carry out all their activities and, at the same time, give themselves time for rest and recreation. These leisure moments were important to clear up their heads and function in academic and research tasks. Likewise, they avoided postponing homework and studying so as not to fall behind in their homework.

In the achievements for personal satisfaction, the main thing was the intrinsic motivation, that is, knowing that what you want to achieve is that, because you like it, because you have always wanted. GF1/M/GEN6/010517

Having a nine is not difficult, well at least it was not for me, and I think that for nobody here, it has ever been a problem. GF4/M/GEN2/250717

I believe that the most important thing that I have learned during the last year and a half is knowing how to manage time. GF5/M/GEN1/080617

It is difficult to balance everything, at times you are involved in the laboratory and you fall behind in school and then you want to move forward in school and you get behind in the laboratory and then like do some "juggling". GF3/F/GEN4/230617

Find the time to do academic activities, then give yourself the time to rest of these academic activities. I think that it was the best for me during this period. Because if I arrived at home very desperate or very tired of everything that I have at school, I could read for a while and if at night I couldn't read more of the subject that I had to study for the next day, I play something and that is it. GF4/M/GEN2/250717

Independent learning was relevant to obtain high grades in the evaluations and at the same time learn (Navarro, 2003), as reported in the United States study (Kuh et al., 1997), the students recognized that they did not depend on others to answer questions and were active in the search of information to understand what they studied and
investigated.

... doing the Doctorate or even studying medicine, requires a large amount of self-learning, I have had excellent teachers and tutors, but I think the important thing is the student. GF5/M/GEN1/080617

In PECEM students, self-regulation was recognized in their learning, they presented autonomy that implied an active attitude towards the acquisition of knowledge, the ability to observe, monitor and control their own behaviours to obtain more effective learning. Also, an independent, effective and strategic academic performance that alluded to a metacognitive capacity (Vives-Varela, Durán-Cárdenas, Varela-Ruíz, & Fortoul van der Goes, 2014), (Rosário et al., 2014). The intrinsic motivation and the passion to know were essential elements for their excellent academic performance.

Conclusions

The main recommendations derived from the best institutional academic practices and the students that favour the academic performance are:

The accompaniment of those responsible for the program is a relevant institutional practice that encouraged the committed participation of the students. In addition, the mentors of the research rotations provided academic orientation on the research and shared individual experiences of their professional career. Derived from this study one recommendation is to extend this practice in those programs in health sciences that contemplate in their curriculum a research approach.

The interaction of PECEM students with students who did not belong to the program enriched their academic perspective and favoured the exchange of different ways of conceiving health training. Also, PECEM students made the right group decisions, which had a positive impact on their academic performance. It is suggested that institutions include in the pedagogical strategies the development of skills in group decision making.

PECEM participants reported that self-regulation in their learning; mainly time management, independent study, autonomy towards the acquisition of knowledge and motivation to learn, were the essential elements to achieve excellent academic performance. Therefore, another recommendation would be that teachers lead their students to personal and autonomous learning. For this, they need to model self-regulation in the classes, with planning of their educational action, specify the objectives, order the teaching sequences, include different strategies that promote self-regulation and use a formative and self-regulating evaluation (De la Fuente & Justicia, 2003).

The close relationships with mentors and with the personnel responsible for the program are good institutional practices that have a positive impact on academic performance. In the dynamics of student groups, joint decision-making in favour of group development is a consider a best practice. Likewise, self-regulation in learning and motivation to learn are cognitive skills that translate into best practices for academic performance.

Take Home Messages

Notes On Contributors
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Appendices

Figure 1: PECEM in the faculty program of medicine

Table 1. Focus groups carried out in the PECEM generations

| Generation | Participants | Absent: Women / Men | Date of the GF | Semester in progress |
|------------|--------------|---------------------|----------------|---------------------|
| First (6)  | 2/3 / 0/1    | 0/1                 | 08/06/2017     | 14                  |
| Second (11)| 1/9 / 1/1    | 1/1                 | 06/25/2017     | 12                  |
|                | 2/5 | 1/0 | 18/09/2017 | 10 |
|----------------|-----|-----|------------|----|
| Third (8)      |     |     |            |    |
| Fourth (12)    | 4/8 | 0/0 | 23/06/2017 | 8  |
| Fifth (11)     | 5/6 | 0/0 | 19/06/2017 | 6  |
| Sixth (11)     | 3/5 | 2/1 | 05/24/2017 | 4  |
| Total focus groups: | 6   |     |            |    |
| 16/36 students (52) total: | 59  |

**Declaration of Interest**

The author has declared that there are no conflicts of interest.