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Analysis of Teachers' Opinions about Student Participation in Entrepreneurial Activities in an Institution of Higher Education

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Abstract: This article aims to analyze the opinions of professors in a Mexican university about the participation of undergraduate students in entrepreneurial activities within their programs. This research used a quantitative methodology to determine whether students were encouraged to develop entrepreneurial skills and if they could identify those skills. In total, 60 teachers from different campuses and majors of six schools answered a questionnaire. The results showed that most teachers believed that the students in their programs could interact with entrepreneurs, participate in activities related to entrepreneurship as required, and learn entrepreneurial skills in their majors. However, most of the teachers indicated that the students also needed to learn more about entrepreneurship and recognized little or nothing about their entrepreneurial skills and that no instrument existed to identify and measure those skills. When analyzing the teachers' responses from three schools of the university, we observed that the teachers felt that the subject of entrepreneurship was less addressed in the School of Medicine and Health Sciences than in the Schools of Engineering and Sciences or Architecture and Design. Therefore, we recommend strengthening career programs with activities that identify and develop entrepreneurial skills. The results from this research can guide the teachers and authorities of the institution in determining opportunity areas and activities that promote the entrepreneurial mindset that the institution has set as a goal in its 2030 educative model.

Keywords: *Educational innovation, higher education, entrepreneurial education, entrepreneurial skills, entrepreneurship*

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INTRODUCTION

The world is transforming, mainly due to the challenges of automation and the social, environmental, and technological requirements of the so-called Industry 4.0 (Wilai, Surachai, Kittikhun, & Santidhorn, 2018; Zuzeviciute, Praneviciene, Simanaviciene, & Vasiliauskiene, 2017). For this reason, higher education institutions must make changes so the students can acquire the skills necessary for the knowledge society, including innovative entrepreneurship, self-knowledge, social intelligence, communication, and digital transformation (Gatpandan & Ambat, 2017; Huq & Gilbert, 2017).

In the case of entrepreneurship, the training pedagogy should be oriented more to learning methods and processes than to content (Huq & Gilbert, 2017), where the student must assume an active role in their training and commit to lifelong learning. Therefore, it is crucial to analyze how to train entrepreneurs and know the best ways to teach students to improve in innovation and development processes. Doing so increases the possibility of generating future jobs and

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further stimulating economies (Rideout & Gray, 2013).

For this, universities should play a leading role in developing creative and innovative talent (Florida, 2014) and employ strategies that strengthen entrepreneurial skills (Portuguez Castro, Valenzuela González, & Navarro Corona, 2018). However, developing the appropriate mechanisms to foster entrepreneurial and innovative capabilities at all the school levels is one of the main challenges for educational institutions (Padilla-Meléndez, Fernández-Gámez, & Molina-Gómez, 2014). The new programs should include methods that enhance capacities for reflection, critical thinking, and participation in community problems (Sánchez, 2010). These are methods that schools with an entrepreneurial vision need to develop in order to meet the new requirements of today's society (Inter-American Centre for Knowledge Development in Vocational Training (ILO/Cinterfor), 2017).

This study seeks to analyze the opinion of higher education teachers to find out if entrepreneurial activities in the careers offered by a university located in Mexico exist that favor the development of these skills. For this, we applied a questionnaire to determine, among other things, if the students were motivated to develop entrepreneurial skills within their careers (if they can identify those skills) and if they are guided to take courses in entrepreneurship. The results of this research can guide the teachers and authorities of the institution to determine opportunity areas and include activities that favor the development of entrepreneurial skills.

LITERATURE REVIEW

Entrepreneurship education involves the transfer of knowledge to determine what opportunities exist in the creation of goods and services (Maritz, 2017). Pedagogical programs arise that aim to develop entrepreneurial skills and to empower individuals in the implementation and management of new business (Fayolle, 2013) through training activities.

ENTREPRENEURIAL SKILLS

Developing entrepreneurial skills is essential to be competitive and to take risks. A first step in developing entrepreneurship is to identify the skills that people have (Chew, Hoe, Kim, & Kiaw, 2016). Moreover, one stage before the creation of a new business is the entrepreneurial intention; if the person has this interest, he/she will be willing to start a project (Sánchez, 2010). Education contributes to developing this intention, so actions that increase skills such as self-efficacy, proactivity, and innovation will also improve entrepreneurial intention. For this, pedagogical programs arise to empower individuals to create a new business (Fayolle, 2013) through training activities.

Self-efficacy is the extent to which people trust their abilities to determine the challenges they can undertake, how much effort they must use to overcome them, and how much they must persevere in facing obstacles (Mauer, Neergaard, & Linstad, 2017). Furthermore, the presence of self-efficacy can help people to improve their intention to develop ventures. This intention is the ability to create a business, add value to an existing organization, or maintain interest to do so in the future (Palazzeschi, Bucci, & Fabio, 2018).

Another skill is proactivity. The proactive person is one who shows initiative, detects opportunities and acts on them, and perseveres until achieving a goal (Kozubíková, Čepel, & Zlámalová, 2018). This skill involves anticipating problems before they happen and taking action or seeing changes and adapting to meet the new needs of a given situation (Yan, Gu, Liang, Zhao, & Lu, 2018). Proactivity is an essential trait for entrepreneurs looking to find business opportunities. Koe (2016) mentions that when a person can identify a business idea and see its usefulness, he or she has excellent potential to be an entrepreneur.

Finally, innovative capacity (innovation) is related to the generation of new ideas to produce goods and services (Martens, Machado, Martens, de Oliveira e Silva, & de Freitas, 2018). For entrepreneurs, this feature is essential due to the competitive environment in which they operate. Previous studies show that thanks to courses they had taken as part of their study program, students can develop a high degree of intention to start new companies (Koe, 2016). Also, the opportunity to participate in competitions and exhibitions that share innovative ideas deepens the connection between innovation and the interest of students in becoming entrepreneurs. Therefore, encouraging the sharing of new ideas in public and participating or working in real companies to improve these skills is highly recommended.

Entrepreneurial Education Programs

Educational programs in entrepreneurship are increasingly focused on creating business-building experiences for students, so the courses differ from those of traditional management courses (Byun, Sung, Park, & Choi, 2018). The focus of entrepreneurial programs is on providing knowledge that students apply through their ideas on generating

new value propositions, so it is necessary for the content, resources, and experiences presented to prepare them for this purpose. In universities, entrepreneurship education is increasingly relevant, and the number of study centers that are incorporating these programs is on the rise (Baggen et al., 2018). Research of entrepreneurial education aims at knowing how entrepreneurs learn in these contexts to integrate theory into practice (Harmeling & Sarasvathy, 2011). It seeks to answer the question of how to teach entrepreneurship. Within universities, there are three types of entrepreneurship education programs, namely, about entrepreneurship, for entrepreneurship, and through entrepreneurship (Lackéus, 2015).

TYPES OF EDUCATION PROGRAMS FOR ENTREPRENEURSHIP

Educational courses in entrepreneurship have theoretical content designed to raise student awareness about the subject to increase their interest in considering self-employment and, thus, developing their career (curriculum) accordingly (Fayolle, 2013). In traditional courses, the topics are related to the business plan, marketing, and financing. This kind of training uses lectures, expert guest speakers, and case studies taken from textbooks to present content, so the learner is passive, and the course is teacher centered (Piperopoulos & Dimov, 2014).

The courses in entrepreneurship programs teach how to start a business, and the topics aim at generating ideas, creativity, innovation, opportunities, sales, networking, and failure management (Fayolle, 2013). For Lackéus (2015), this type of program develops the necessary skills for entrepreneurship, mainly using methodologies such as simulation, learning by doing, and mentoring. In these programs, the student acts as an entrepreneur instead of merely doing entrepreneurial practices. In other words, the entrepreneurial programs allow the student to be an entrepreneur instead of simulating it. Within the activities are business ideas to present to potential investors, plans for incubators, or real projects that expose the students to the customers (Sirelkhatim & Gangi, 2015). In this case, the courses are carried out following experiential learning and learning by doing; these educational institutions tend to put the students in real undertakings. This type of training presents various challenges; notably, there can be teacher resistance and the high costs involved in implementing it (Lundqvist & Middleton, 2013).

One of the main challenges for educational institutions is to develop the appropriate mechanisms to promote entrepreneurial and innovative skills at all levels of training (Padilla-Meléndez et al., 2014). Therefore, these programs should develop methods that improve capacities such as reflection, critical thinking, and participation in community problems, which are skills that anticipate the new requirements of the current and future society.

RESEARCH METHODOLOGY

This research follows a quantitative methodology that uses statistical analysis to focus on specific points of a phenomenon and compare the results with similar studies (Hernández-Sampieri & Torres, 2018). The study was carried out from September 10 to October 24, 2019. The tool was a questionnaire applied to professors from various careers (disciplines) and different campuses of the University. In total, we received 60 responses from teachers at 14 campuses and six different schools in this institution. This section presents the context, the participants' profile, the instrument used, and how the data was analyzed.

Context

The study was carried out at a Mexican university that has produced a strategic plan for 2030 in which entrepreneurship and innovation are considered necessary resources for emerging and developing talent. This institution proposes strategies that align with the skills required of 21st-century citizens. The educational model that contains these strategies aims to develop an entrepreneurial mindset in students to embrace transversal competencies so that the graduates of the University are equipped to excel in the new and ever-changing labor market.

Participants

The participants were 60 professors from different campuses and various undergraduate disciplines. An online questionnaire was sent to obtain their opinions about the students' entrepreneurial activities during their careers. These participants were chosen for convenience because they agreed to be included in the study. The participants' profile was 68% men and 32% women, with an average of 12 semesters of experience as teachers in their areas. Figure 1 shows the distribution by campus location in Mexico of the university. Most of the professors who answered the questionnaire came from the Monterrey campus (12), the Guadalajara Campus (10), and from Mexico City (8).

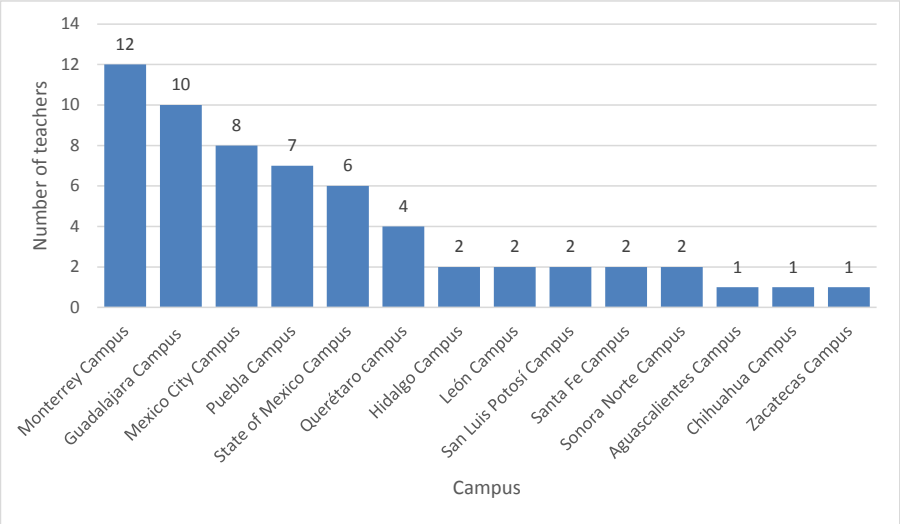

Figure 1 *Distribution of Participants by Campus*

Figure 2 shows the distribution of professors by the school. Of the total number of participants, 32 belonged to the School of Engineering and Sciences (53%); 12 to the School of Architecture and Design (20%); 10 to the School of Medicine and Health Sciences (17%); 4 to the School of Social Sciences and Government (7%); 1 to the School of Humanities and Education (2%), and 1 to the Business School (2%).

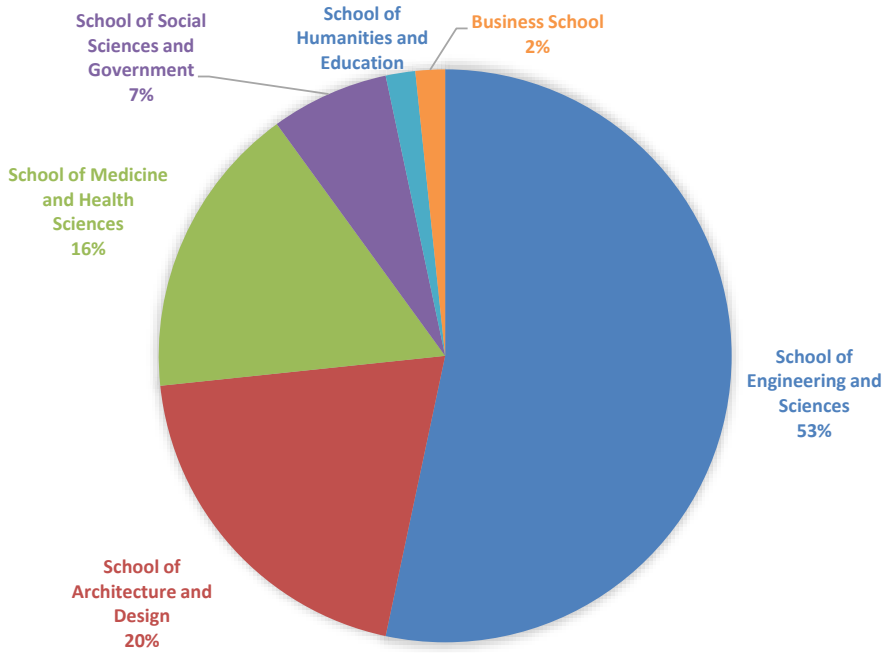

Figure 2 *Distribution of Participant Teachers by School in the University*

Instrument

The teachers' opinions about the entrepreneurial activities of students pursuing professional careers came from a section of The Engineering Entrepreneurship Survey (EES) developed at Purdue University in the United States by Duval-Couetil et al. (2010). It surveyed perceptions about the level of student participation and the degree of promotion of entrepreneurship in their programs. This instrument is comprised of 10 questions where responses were recorded using a four-point Likert scale, where 1 = None, 2 = Little, 3 = Sufficient, and 4 = a lot. The ten items to indicate the degree of agreement were:

- Item 1. Entrepreneurship is discussed.
- Item 2. Students learn about entrepreneurship skills throughout their careers.
- Item 3. Students are encouraged to take entrepreneurship courses.
- Item 4. Participation in activities related to entrepreneurship is required.
- Item 5. Students are encouraged to consider starting new businesses.
- Item 6. Entrepreneurship is presented as a career option worth developing.
- Item 7. There are opportunities to interact with entrepreneurs.
- Item 8. Students must learn more about entrepreneurship.
- Item 9. Students identify their entrepreneurial skills.
- Item 10. An instrument is applied to know the entrepreneurship skills of the students.

The questionnaire was sent by email to 100 professors on different campuses and teaching in various school programs. The email explained the purpose of the study, and 60 agreed to participate. They completed the questionnaire from September 10 to October 24, 2019.

Analysis of Data

Data analysis was performed with the Minitab version 19 program. We used Cronbach's Alpha to determine the reliability of the instrument. When analyzing the participant data, we used the distribution of frequencies and percentages to determine the distribution of participants by campus and schools. Also, we used percentages for the Likert-type scale to determine the teachers' assessments of the different items. The mean and standard deviation measured the dispersion of the data (Hernández-Sampieri & Torres, 2018). First, we analyzed the data of the 60 participants. Then we compared the percentages for the three schools with the highest representation to determine if there were differences in the responses.

RESULTS AND DISCUSSION

The results obtained showed high reliability, with a Cronbach's Alpha of 0.92, which is considered convenient and approximates that obtained by the original instrument, which was 0.89 for the section on questions related to entrepreneurship activities (Duval-Couetil, Reed Roads, & Haghighi, 2010). The items of the questions asked if the programs addressed the topic of entrepreneurship. To summarize the information, we grouped the 4-point response scale into two types of responses: "a lot and sufficient" agree responses, and "little or none" responses. The results are in Table 1.

Table 1 *Teacherst' Responses per Item*

Item	A lot/ Sufficient	Little/ None	Mean	Standardd Deviation
1. Entrepreneurship is discussed.	65%	35%	2.7	0.889
2. Students learn about entrepreneurship skills throughout their careers.	68.33%	31.67%	2.933	0.954
3. Students are encouraged to take entrepreneurship courses.	67%	33%	2.950	0.982
4. Participation in activities related to entrepreneurship is required.	71.67%	28.33%	2.983	1.017
5. Students are encouraged to consider starting new businesses.	68.33%	31.67%	2.933	0.954
6. Entrepreneurship is presented as a career option worth developing.	63.33%	36.67%	2.8	0.953
7. There are opportunities to interact with entrepreneurs.	71.67%	28.33%	3.017	0.930
8. Students must learn more about entrepreneurship.	88.33%	11.67%	3.317	0.854
9. Students identify their entrepreneurial skills.	41.67%	58.33%	2.4	0.785
10. An instrument is applied to know the entrepreneurship skills of the students.	28.33%	71.67%	2.033	0.938

For the item, "entrepreneurship is discussed in the program," 65% said that they agreed with the statement a lot or sufficiently. 68.33% agreed that "students learn about entrepreneurship throughout their careers," and 67% felt

that the "students are encouraged to take entrepreneurship courses." 71.67% indicated that it is required to participate in entrepreneurial activities and 68.33% that they are motivated "to consider new businesses." 63.33% believed that entrepreneurship is a career option and 71.67% that it is possible to interact with real entrepreneurs. On the other hand, 88.33% of those surveyed felt that students should learn more about entrepreneurship, 41.67% thought that students do not recognize their entrepreneurial skills and 71.67% that there is no instrument to measure those skills.

The standard deviation indicates how dispersed the data from the mean is. In this case, the standard deviation is less than or close to 1, so most of the data clusters close to the mean (Portuguez Castro et al., 2018; Portuguez Castro, Ross Scheede, & Gómez Zermeño, 2019). The items that were below the mean were if they applied an instrument to learn entrepreneurship skills in the degree program (2,033), if students identified their entrepreneurial skills (2.4), and if entrepreneurship is presented as a career option (2.8). The highest means were for the items that ask whether students should learn more about entrepreneurship (3,317), if there is an opportunity to interact with entrepreneurs (3.01), and if it is required to participate in activities related to entrepreneurship (2.98).

Table 2 shows the results of the analysis when analyzing the responses from the careers (disciplines) that had the highest representation in the sample; for this, the results of the Schools of Engineering and Sciences (ES), Architecture and Design (AD), and Medicine and Health Sciences (MHS) were compared.

Table 2 *Comparison of Professor Responses by School*

Item	Engineering & Sciences	Architecture & Design	Medicine & Health Sciences	Overall
1. Entrepreneurship is discussed.	72%	58%	50%	65%
2. Students learn about entrepreneurship skills throughout their careers.	75%	75%	40%	68%
3. Students are encouraged to take entrepreneurship courses.	75%	75%	30%	67%
4. Participation in activities related to entrepreneurship is required.	81%	83%	30%	72%
5. Students are encouraged to consider starting new businesses.	69%	75%	50%	68%
6. Entrepreneurship is presented as a career option worth developing.	72%	83%	20%	63%
7. There are opportunities to interact with entrepreneurs.	81%	83%	30%	72%
8. Students must learn more about entrepreneurship.	91%	100%	70%	88%
9. Students identify their entrepreneurial skills.	41%	42%	20%	42%
10. An instrument is applied to know the entrepreneurship skills of the students.	31%	33%	10%	28%

For the question of whether entrepreneurship is discussed, 72% of ES School teachers responded a lot or sufficiently, while in the AD and MHS Schools, those percentages were 58% and 50%, respectively. For the question of whether students learn entrepreneurial skills throughout their career, ES and AD had the same percentage (75%) that they do, while in the MHS School, only 40% agreed.

In the item related to whether entrepreneurship courses are encouraged, the same response percentage was obtained for the ES and AD schools (75%), but it dropped to 30% in MHS. 81% of ES participants considered that the students were required to participate in activities related to entrepreneurship, 83% of those in the AD degree program agreed, but only 30% of those in the MHS School indicated that they do.

For ES teachers, students are motivated to start new businesses (69%), while in the Schools of AD and MHS, the percentages were 75% and 50%, respectively. In the query about entrepreneurship being presented as a career option, 72% of ES teachers agreed, 83% of AD professors, but only 20% of the MHS faculty respondents held this opinion.

When asked if there is an opportunity to interact with entrepreneurs, 81% of the ES professors agreed, 83% from the School of AD also, but only 30% of the MHS instructors felt that the students had such opportunity. When asked if students should learn more about entrepreneurship, 91% of ES teachers believed that, 100% from the AD School, and 70% of MHS teachers.

In the case of whether the students can identify their entrepreneurial skills, 41% of the ES teachers agreed, 42% of AD professors, but only 20% of MHS faculty respondents held that belief. Finally, when asked if there were an instrument to measure entrepreneurial skills, the percentages of agreement were very low, being 31%, 33%, and 10%, respectively.

When comparing the overall results of the three schools, we observe that they are similar in the Schools of ES and AD, except for the first item (whether entrepreneurship is discussed in the careers), where the agreement was higher among the teachers in the School of ES.

In the School of Medicine and Health Sciences, the percentages of agreement were much lower than those expressed by their colleagues in the other two schools in all items. They were also below the overall mean in all items. Thus, we observe that for the participants in the careers in the School of MHS, entrepreneurship is not emphasized like in the other two schools. Figure 3 shows a comparison of the results obtained for the three schools and the overall percentage for each item.

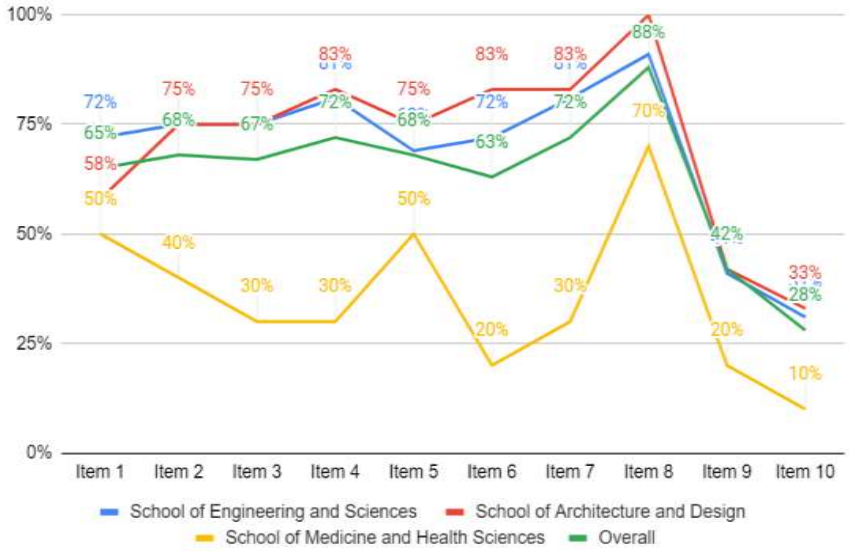

Figure 3 *Comparison of Item Percentages for the Three Schools*

According to the results, the students are participating in entrepreneurship activities within their careers. They have the opportunity to interact with entrepreneurs, which promotes the development of their entrepreneurial skills and interest in the creation of new businesses (Fayolle, 2013; Lackéus, 2015). When comparing the results of this study with those obtained by Duval-Couetil et al. (2010) in a survey conducted with 343 students at three universities having entrepreneurship programs, we got superior results in this research than those presented in that study. For example, when asked whether students are encouraged to take entrepreneurship courses, our research result was 68%, while that of Duval-Couetil et al. (2010) was 21%. Also, when asked if students are motivated to consider starting new businesses, our research response was 68% agreement, while in the three universities of the Duval study, it was only 13%. Another difference occurred when the respondents were asked if the students learn entrepreneurial skills; our study result was 68% overall agreement, but only 17% for Duval-Couetil et al. (2010).

In our literature review, we found that encouraging students to enter into entrepreneurial activities within the University motivates them to develop an entrepreneurial intention (Sánchez, 2010) to start new companies. This has to do with the courses taken as part of their curricula, which orients them toward the development of entrepreneurial skills (Koe, 2016). In general, this study shows that the careers (disciplinary curricula) in this University are integrating entrepreneurial programs and that the teachers assess these aspects highly.

Regarding the items that ask whether students should learn more about entrepreneurship, the teachers indicated

that learning these skills is required. They emphasize that students need to identify their entrepreneurial skills, and, furthermore, believe that there is no instrument to measure those skills. This result agrees with the study by (Chew et al., 2016) in which to grow entrepreneurship, it was considered necessary to recognize these skills and that one of the main challenges for educational institutions is to develop them in all levels of training (Padilla-Meléndez et al., 2014).

The results obtained from the teachers instructing in the careers of the MHS School manifest this difficulty, where the agreement percentages with the items in the instrument are much lower than those of the other schools. Therefore, it is necessary to review the programs in this School and include activities such as those we propose in this study. The program developers need to motive the professors to integrate entrepreneurial activities into their training proposals.

One limitation of this study is that the sample of professors queried does not represent all the campuses and careers of the University. So, the results are limited to the responses from this group of participants. However, it points to areas of opportunity for professors and the university administration. For future studies, we recommend expanding the sample and selecting a more representative group that includes other campuses not in this study and making comparative analyses in different careers.

CONCLUSION AND IMPLICATIONS

This study presents the survey results from professors teaching at a university in Mexico regarding the participation of students in activities related to entrepreneurship. In general terms, the opinions of the people consulted indicated that students do carry out entrepreneurial activities in their academic curricula (known as careers in the University). However, they also felt that the students cannot identify their entrepreneurial skills and that no instrument exists to measure these. They believed that their students could still learn more about entrepreneurship.

Furthermore, the agreement about entrepreneurial development was less in the School of Medicine and Health Sciences as compared to the Schools of Engineering and Sciences and Architecture and Design. This was true in all ten items measured and in the overall results, which reported the means for all three schools. This reveals an opportunity area for educators in the School of MHS who are involved in incorporating these programs and reviewing entrepreneurial programs in their careers. This study also provides useful data that can be used by university authorities aiming to develop the entrepreneurial mindset in the professors and students in all the university careers and campuses.

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