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Students' profile when enrolling in the Faculty of Agricultural Sciences at Universidad Central del Ecuador

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Abstract

In this article, we approach the enrollment profile of students to the Faculty of Agricultural Sciences in the Universidad Central del Ecuador, through the analysis of strategies, motives and learning approaches that model students' behavior and influence their performance. The lack of interest and the documents published around the Agricultural Sciences give emphasis to experimental research, leaving aside educational research, resulting in few studies on the subject at a national and international level. It was applied the Study Process Questionnaire - Revised R-SPQ-2F in a virtual and voluntary way. The population consisted of 80 students of the Agricultural Engineering Program, and 20 students of the Ecological Tourism Course. The learning approaches were related to extra-curricular factors such as academic career, gender and the level of parental study. The results show that the majority of students prefer the superficial approach, which is based on extrinsic motivation, and commits to rote learning. No relevant relationship was found between the learning approach and extracurricular factors; however, students with parents with the highest educational level presented the most superficial approach. The above points out that the objective of the students is to approve their studies, even though this implies obtaining the minimum (approbatory) grades. We conclude that it is essential to know the student's profile at enrolling, in order to implement methods and methodologies to achieve meaningful learning, as well as to prevent failure and student dropping out.

Key words: Interdisciplinary approach, active learning, methodology, motivation.

Introduction

In 2011, Ecuador implemented the Unified General High School (BGU, for its initials in Spanish), leaving aside the specializations, giving students the possibility of opting for any university career, depending solely on the score obtained in the National Higher Education Exam (ENES), the same that evaluates the verbal, numerical aptitude and the abstract reasoning. The result was the income of heterogeneous students in terms of skills, interests and motivations, this complexity warns a change in the profile of the new students; this change requires reflecting on their learning processes. Salim and Lotti (2011) assure that, "the presence of this plurality in terms of abilities, interests or motivations to learn demands a teaching centered on learning, which requires considering students and taking into account their learning processes when designing and implementing teaching strategies."

Biggs (1988), points out that when faced with a learning scenario, students must take into consideration two aspects: the Motives and goals that they want to achieve, as well as the strategies and cognitive resources that are indispensable to reach the goal. Then, it should be noted that learning is directly related to the cognitive, affective, psychological and behavioral aspects of students. Thus, for García (2016), "learning approaches are constituted as a set of intentions and strategies that guide and condition students' performance during the learning process".

Students are not the only participants in the educational context, because learning is a cognitive activity, so it cannot be separated from the cultural environment. Despite this, students are ultimately the ones who decide, making learning an individual activity, dependent on personal characteristics and available resources. From this individualization of learning, Barca cites: "Learning results from the interrelation of three key elements: the intention (motive) of the learner, the forms or procedures that they use (strategy) and the achievements that they obtain (performance)" (Barca, 2002: 67).

García (2016) quotes:

> The learning approach is not constituted as a characteristic that the individual possesses, but rather as a result of the interaction between the individual and their learning context; therefore, it is not a static or immovable characteristic of the subject. That is, the development of a specific learning approach is related to the educational experiences lived by students, and therefore it has a contextual nature (p.30).

In addition, as stated by Herrera and Lorenzo (2009): "For university students to show sufficient academic maturity to guarantee the necessary autonomy in study and learning, it is necessary to analyze not only the cognitive, metacognitive and resource regulation strategies that this has, but also teaching strategies and methodologies that teachers implement. This situation should

provoke an adequate response from the university authorities to improve the effective involvement of both students and teachers.

The responsibility of the teacher in the direction of the training process, in the creation of favorable conditions for learning, and by his influence that could have on students with whom he performs his work. Mirete et al. (2015) have identified the characteristics of students, which has allowed proposals that could affect the improvement of the quality of learning and academic performance, minimizing school failure. Learning approaches influence academic performance (Riveros et al., 2011, Gargallo et al., 2012).

The possibilities for innovation depend on teachers and the restrictions or potential of the specific institutional areas where these practices are developed (Araujo, 2016). Teachers can enhance the Deep Approach of learning by using relevant teaching methodologies and assessments (Gargallo et al., 2012). Learning requires the interest and willingness of the learner for their own learning or for the activities that lead to it (motivation), the use of skills, actions and thoughts that occur during learning (strategies), and also of the conception of learning that students have, and how they approach it (learning approaches) (Salim and Lotti, 2011).

The dependence on approaches or approximations implies an interrelation between the personal characteristics and the reactions induced by learning situations. This means that although individuals are predisposed, due to their personal characteristics, to adopt a certain approach, it is also true that certain situations stimulate, favor or inhibit the adoption of certain approaches. This criterion reinforces the role of the teacher in the adoption of strategies and methodologies that favor learning (Valle et al., 2000).

Valle et al. (2000) highlight the existence of a certain relationship between the type of motivation and the learning approaches that students show when faced with a specific learning task. Intrinsic motivation (or a high degree of interest in content and its relevance) seems to be closely related to a Deep Approach; when what predominates is the fear of failure, the learning approach tends to be superficial; and finally, when the predominant is a high need for achievement or a high motivation for success, the learning approach tends to be of a strategic nature ... the deep and achievement approaches seem to be associated with high qualifications and results of qualitatively superior learning, the superficial approach is related to low levels of performance and qualitatively inferior learning outcomes.

Being students who decide what to learn and how to learn, their point of view acquires a relevant importance; therefore, it is necessary to know the instruments and the way they process information; the motives, interests and attitudes that lead them to acquire knowledge. Biggs (1988), proposes an instrument that takes into consideration the point of view of students to carry out learning process, and presents the *"Study Process Questionnaire -SPQ-"*, applicable in the university context for Spanish speakers, the same one that was adapted by Barca (1999).

The structure of the questionnaire includes superficial, deep and achievement approaches; their interrelation forms the affective or motivational element; in the same instrument, there are considered the sub scales of motives and strategies that form the cognitive and instructional element. In short, the instrument is a set of scales and sub scales that is based on the Motive-Strategy model.

Valle et al. (2000) describe the characteristics of learning approaches such as:

Superficial approach: students who intend to meet the minimum requirements of the task, with a minimum of effort and involvement in it (Motive); they will implement certain strategies aimed at mechanically and repetitively learn the information and reproduce it at the appropriate time.

Deep Approach: students with a high intrinsic interest and a high degree of involvement in what they are learning, with the intention of understanding it significantly (motive); they will develop strategies aimed at discovering the meaning of what they will learn by establishing relationships with relevant prior knowledge.

Achievement approach: more than the greater or lesser involvement in the content, the search for relationships with previous knowledge or the mechanical memorization of the learning material, this approach is characterized by the planning and organization of the different activities with the priority objective of obtaining academic achievements as high as possible. It implies to enhance the "I" and the self-esteem through

success (Motive), programming and organizing the time and the resources (strategy), in order to obtain high qualifications (grades).

The deep approach is characterized by the intention to understand the meaning of what is being worked on academically, to make connections between new contents and previous experience, and to present self-regulated behaviors and learning strategies. This self-regulated behavior is guided by the search for meaning or personal meaning of the academic or learning situation, and the satisfaction (intrinsic motivation) that this produces. For its part, the superficial approach to learning, unlike the deep approach, is characterized by not giving importance to the search for meaning and tend to rather memorize the contents in an unconnected way, with the aim of approving or at least not failing (extrinsic motivation) (García, 2016).

From the above, it is deduced that the superficial, deep and achievement learning approaches have different levels of processing. The superficial approach is characterized by performing minimal learning activities based on memorization, resulting in thoughtless learning strategies. On the contrary, the Deep Approach is interested in different topics and its intention is to understand. On the other hand, the achievement approach assesses the effectiveness and efficiency of studying, in relation with the obtained grades (Tait et al., 1998, Entwistle et al., 2001).

The use of the instrument to monitor the learning approaches of university students gave results that indicate that using SPQ as a means to monitor teaching/learning environments, the role of the scale in relation with achievement is not as evident as that of the deep and superficial scales (Biggs et al., 2001). From this process, the author saw the need to build a shorter version of the SPQ questionnaire, which examines only superficial and deep approaches, resulting in the "Revised-Study Process Questionnaire-2 Factors" R-SPQ-2F.

The objective of this research was to determine the profile of students who start their studies in the Faculty of Agricultural Sciences in the fields of Agronomic Engineering and Ecological Tourism at the Universidad Central del Ecuador, based on the learning approaches proposed by Biggs in the Questionnaire R-SPQ-2F, in order to obtain information about the recipients of the learning process.

Methodology

This study was exploratory and descriptive. It was used the survey method. A self-report questionnaire was used to gather information related to the objectives of the study. By using an observational methodology, we sought to understand the meanings that students give to learning. It was used a non-random sample of first-semester volunteers from the Universidad Central del Ecuador, Faculty of Agricultural Sciences, enrolled in the Agronomic Engineering and Ecological Tourism programs. The sample was constituted by 80 students of Agricultural Engineering and 20 students of Ecological Tourism, corresponding to 52% men and 48% women, aged between 18 and 21 years, during the second semester of the year 2015.

The instrument used was the utilitarian R-SPQ-2F, adapted to Spanish by Barca (1999), widely used in higher education. This instrument is complemented on a Likert scale (1-5), consisting of 20 items on learning approaches; 10 items evaluate the deep factor and 10 the superficial factor. These factors are subdivided into two scales at the same time: motive and strategy, which have 5 items each. Thus, "The final version of the questionnaire has two main scales, Deep Approach (EP) and Superficial Approach (ES), with four sub scales: Deep Motive (PM), Deep Strategy (PE), Surface Motive (SM) and Surface Strategy. (SE) "(Biggs et al., 2001).

Students were invited to voluntarily answer the questionnaire (see table 1), during their free time, analyzing each item with the possibility of choosing among: "totally disagree" (TD), "disagreement" (D), "more agree than disagree" (MAD), "agreement" (A) or "totally agree" (TA), since the instrument was published on the website through an internet utility for file storage service, Google Drive. The time required to answer the entire questionnaire was 20 minutes maximum.

Table 1. Questionnaire used to study the profile of students enrolling the Faculty of Agricultural Sciences at Universidad Central del Ecuador.

Items	Questions
1	I find that at times studying gives me a feeling of deep personal satisfaction.
2	I find that I have to do enough work on a topic so that I can form my own conclusions before I am satisfied.
3	My aim is to pass the course while doing as little work as possible.
4	I only study seriously what's given out in class or in the course outlines.
5	I feel that virtually any topic can be highly interesting once I get into it.
6	I find most new topics interesting and often spend extra time trying to obtain more information about them.
7	I do not find my course very interesting so I keep my work to the minimum.
8	I learn some things by rote, going over and over them until I know them by heart even if I do not understand them.
9	I find that studying academic topics can at times be as exciting as a good novel or movie.
10	I test myself on important topics until I understand them completely.
11	I find I can get by in most assessments by memorizing key sections rather than trying to understand them.
12	I generally restrict my study to what is specifically set as I think it is unnecessary to do anything extra.
13	I work hard at my studies because I find the material interesting.
14	I spend a lot of my free time finding out more about interesting topics which have been discussed in different classes.
15	I find it is not helpful to study topics in depth. It confuses and wastes time, when all you need is a passing acquaintance with topics.
16	I believe that lecturers shouldn't expect students to spend significant amounts of time studying material everyone knows won't be examined.
17	I come to most classes with questions in mind that I want answering.
18	I make a point of looking at most of the suggested readings that go with the lectures.
19	I see no point in learning material which is not likely to be in the examination.
20	I find the best way to pass examinations is to try to remember answers to likely questions.

Source: Barca, A. (1999). CEPEA. Questionnaire for the Evaluation of Study and Learning Processes for university students. Manual, A Coruña, Publicaciones de la Revista Galego-Portuguesa de Psicoloxia e Educación.

Using the Excel application and due to its versatility, the information was processed in order to sort, filter, expose, cut, interrelate and (then) graph the results obtained. For the analysis of the results, there were applied the criteria established by Biggs (see table 2).

Table 2. Criteria established by Biggs and collaborators

Scoring for the main scales of the R-SPQ-2F	
Deep Approach	1+2+5+6+9+10+13+14+17+18
Superficial Approach	3+4+7+8+11+12+15+16+19+20
Scoring for the sub-scales of the R-SPQ-2F	
Deep Motive	1+5+9+13+17
Deep Strategy	2+6+10+14+18
Surface Motive	3+7+11+15+19
Surface Strategy	4+8+12+16+20
Summing up of items for scoring scales and sub-scales of the R-SPQ-2F	

Source: Biggs, J.; Kember, D.; Leung, D. (2001): The revised two-factor Study Process Questionnaire: RSPQ-2F. British Journal of Educational Psychology, 71: 133-149.

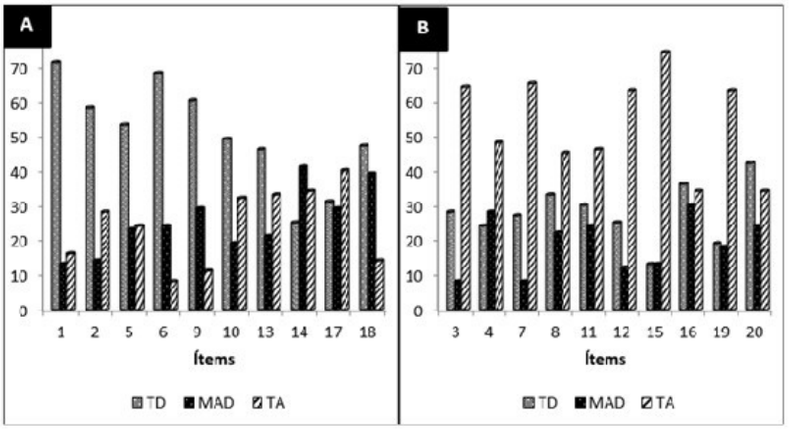
The statistical analysis was of descriptive type, where the questionnaires provide a general idea of the learning tendencies that predominate in the studied population. First of all, students' profile at enrolling was analyzed regarding the approaches, motives and learning strategies. To facilitate the reading of the answers, there were obtained the sums of TD + D and A + TA. Reducing the answers to three options (TD, MAD, TA), which were captured in graphics The answers were then reduced to three options (TD, MAD, TA), which were expressed in graphics. A second analysis was carried out linking the focus of learning with the career, gender and education level of the parents.

Results

About the approaches

The analysis was made based on students' answers to the items of the main scales of Deep and Superficial Approach (figure 1).

Figure 1. Individual responses: A: To the Focus of Deep Learning. B: To the Focus of the Surface Learning.



Source: the authors

Deep Approach (EP)

In the analysis of the deep learning approach, only in items 14 (I use more time to study interesting topics) and 17 (I bring questions to class to solve them), students indicated to conceive it; they are interested in obtaining the maximum knowledge and their purpose is to understand (Figure 1A); however, it can be seen that in item 14, the majority of students have an ambiguity in their approach to learning. The analysis of the other items yields the result of a hegemony of the superficial learning approach.

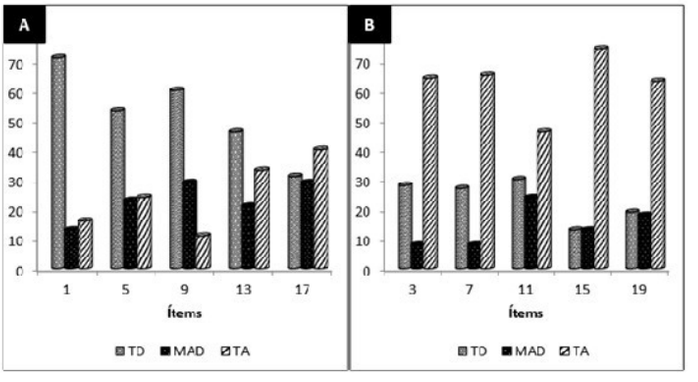
Superficial Approach (ES)

The results with respect to the Superficial Approach (Figure 1B), determine that in items 16 (you should not study subjects that do not go on the exam) and 20 (to memorize the likely answers of the exam), there is a small tendency towards the Deep Approach. However, in all the other items, the tendency is very marked towards the superficial approach of learning on the part of students.

About the Motives

Students' responses were considered in the sub categories of Deep and Surface Motive (figure 2).

Figure 2. Individual responses: A: To the Deep Motive. B: To the Surface Motive.



Source: the authors

Deep Motive (MP)

Item 17 (I take questions to class to solve them) is the only one that points towards a Deep Motive, the preference that students have towards the Surface Motive is marked as shown by the data of the other items (Figure 2A).

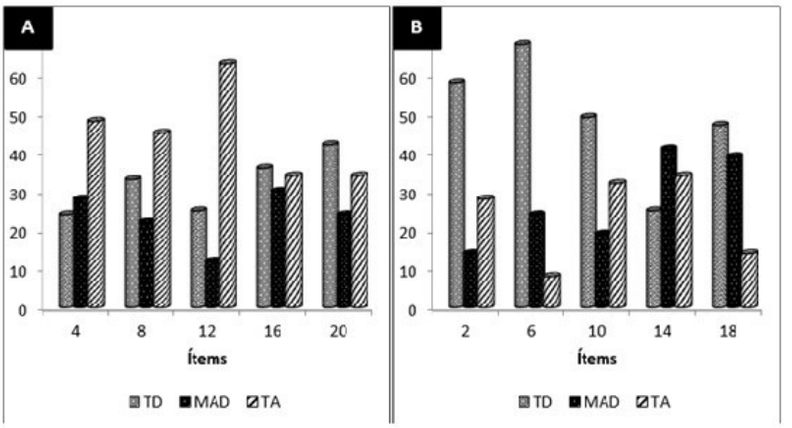
Surface Motive (MS)

The Surface Motive is present with hegemony in all the items; it shows that the students' objective is to approve the subjects, regardless of the minimum qualifications (grades) (Figure 2B).

About the strategies

There were considered the students' responses in the sub categories of Deep and Surface Strategy (figure 3).

Figure 3. Individual responses A: To the Deep Strategy. B: To the Surface Strategy.



Source: the authors

Deep Strategies (EsP)

The results of all the items indicate that students are not interested in maximizing comprehension; and (that) their strategy is aimed at the superficial (strategy), memorizing rather than understanding (Figure 3A).

Superficial Strategies (EsS)

Although there are indicators that show a tendency towards Deep strategies in items 16 (you should not study subjects that do not go in the exam) and 20 (memorize the likely answers of the test), students show their interest in understanding; it is notorious to see that most students are inclined to memorization and mechanical study (Figure 3B).

Discussion

About the approach

Deep Approach (EP) vs. Superficial Approach (ES)

The results obtained in this study suggest that students refer their learning to the superficial approach, which could be predicted by unrelated memorization and fear of failure (Nordin et al., 2013), with the intention of meeting the minimum requirements of the task and effort (Valle et al., 2000).

Martin and Säljö (1976) stated that students can adopt approaches depending on the circumstances of learning conceptions and their own perceptions of learning; however, Richardson (2000) asserts that the choice of a study approach depends on the content, the context, and the demands, especially the tasks. Hence, as proposed by Araujo (2016) and Gargallo et al. (2012), the role of teachers is very important to help modify the learning approaches of students.

In relation to the deep learning approach, the results indicate that the (survey) respondents are engaged in the search for meanings of what they study, rather than memorizing it, in order to understand and obtain the necessary knowledge. This behavior coincides with that expressed by Valle et al. (2000), for the Deep Approach, with a high degree of involvement in what they learn.

About the Motives

Deep Motive (MP) vs. Surface Motive (MS)

When referring to the motives for studies, be they of a deep or surface motive, they are related to the work done by Watkins (2001); in this sense, Wilding and Andrews (2006) believe that the effect of using the Surface Motive in terms of achieving (academic) grades can be positive or negative, depending on the motivation applied on students; on the contrary, Gijbels et al. (2005) blames the nature of the evaluation system developed by education providers for the disappointing results.

García (2016), reports in his research some aspects that influence students to live learning as something pleasant, among which are the attitudes of teachers (willing to help, close and showing interest in students); the methodology used, and the classroom environment (which encourages students to consult the observed problems to their teachers and classmates).

About the strategies

Deep Strategy (EsP) vs. Surface Strategy (EsS)

Salim and Lotti (2011) detail that students use different approaches and learning strategies according to their motivations, it cannot be said that a person has a unique way to study.

The present study revealed that most of the respondents are inclined towards the use of superficial strategic approaches, unlike the results presented by Nordin et al. (2013), which showed congruence with the results of the studies conducted by Biggs (1987) and Richardson (2000).

According to García and De la Hoz (2015), "it is important to offer tools to improve this type of approach, since it is probably necessary to attend some of the necessary competencies to be an excellent professional, given the evidence that associates the superficial approach and memory with low academic performance. Approaches of this type do not allow to establish associations or integrate previous knowledge, which makes complex the process of significant learning."

To have a meaningful learning, Knowles et al. (1984) suggest the use of experimental techniques such as debates, simulations, problem-solving activities, or case methods in class activities. Prior knowledge, experiences and disposition could shape the motivations and strategies, which in turn can influence the approaches adopted by students (Merriam and Mohamed, 2000).

About relationships

Relationship between focus, career and gender

Taking into account that 10 items that are considered in each of the approaches, the maximum score that can be obtained is 50. The superficial approach is the predominant one in the two careers (Agronomic Engineering and Ecological Tourism). The average score obtained by the superficial approach was 1.25 times that of the Deep Approach, for the masculine gender; while for the feminine (gender) this relation was 1.35 times. In addition, the average score of the Deep Approach was 7% higher for the masculine gender than for the feminine (gender).

This behavior indicates that the masculine gender is more interested in the Deep Approach in the two careers. The results obtained coincide with the gender and learning studies carried out by Severiens and Dam (1998), in which they determined that women are more inclined to the study of superficial learning. However, García (2016) also states that the difference between women and men is explicit in terms of the superficial approach, being this approach lower in women. According to these results, it could not be concluded that there is a gender influence in the learning approach. This could be influenced by the learning context, as stated by Richardson (2000) and García (2016).

In the Ecological Tourism academic career, ~~in~~ its feminine gender ~~it~~ is the one that inclines more by a superficial approach. However, we cannot see an influence marked by gender or career with respect to the learning approach used by students.

In another study, Shaari et al. (2011) found that students in general, men and women in a Malaysian university did not show significant differences in learning approaches where they compared the scope of in-depth study, superficial justifications and approaches.

Relationship between approach and level of education of parents

When evaluating the possible incidence of the educational level of parents in the learning approach of their children, it was found that in those students whose parents have an educational level comprised

between the General Basic Education and the Third Level (university level), the superficial approach is manifested in proportion 1.2 by a student with a deep learning approach. However, students whose parents have Fourth Level (postgraduate level), the superficial approach is found at a ratio of almost 1.6 for each student who shows a Deep Approach. That is to say, the superficial approach of learning manifests almost 30% more in students whose parents have Fourth Educational Level, in relation to the other students. This result indicates the need to delve into the causes of such behaviors in learning approaches.

Conclusions

The majority of the surveyed population opt for a Superficial Approach, 53.6%, compared to 24% who have an inclination for a Deep Approach, clearly marking the gap between those who study to understand and those who do it to pass. This infers the lack of student commitment towards learning, the fulfillment of tasks in a mechanical and repetitive way, the uncertainty that causes the development of the exams due to the anguish of approving the signature with the minimum possible grades.

62.4% of students are more concerned with their quantitative assessment than with their desire to internalize learning, versus 24.8% of students who decide that the important thing is the satisfaction of understanding and being able to expose the contents with well-founded arguments. With these results, it is deduced that the Surface Motive is the one that predominates, where the extrinsic motivation is implicit. Although students do not want to disapprove, they do not intend to use more than the minimum time necessary to achieve the objective, that is, their motivation is instrumental, pragmatic and utilitarian.

The use of repetition to memorize contents and to reproduce these in a mechanical way, using concrete and literal contents away from the integration of a whole, result in a rote learning, which leads to a Surface Strategy. 44.8% of students are inclined towards this type of strategy where they study only to pass the exams. Only 23.8% want to understand in order to learn.

The relationship between the learning approach and the extra-curricular elements such as the academic career, gender and the level of studies of the parents did not have a determining influence on the strategies, motives or learning approaches used by students.

The results indicate that, in order to revert the superficial tendency of learning on the part of students, it is necessary to implement methods and methodologies that lead students to improve their strategies and motives of learning until they get the Deep Approach, where research occupies a privileged place. This purpose gives rise to more research on the educational field in Agricultural Sciences. It is planned to carry out other research with the purpose of getting more knowledge about the learning process used by the students of this Faculty.

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