

# The Evolution of Academic Self-Efficacy and Academic Stress on the University Students in Mexico

Luis Fernando Hernández Jácquez\*

Pedagogical University of Durango, Durango, Mexico

\*Corresponding author: [lfhj1@hotmail.com](mailto:lfhj1@hotmail.com)

**Abstract** This research deals around the variables of academic self-efficacy and academic stress arising from the problems presented by undergraduate students of a university in Mexico; it is regarding the perception of poor security experience to do their assignments. The results presented are the first stage of a quantitative study, no experimental and evolutionary groups (cohort), based on the self-efficacy theory of Albert Bandura. These results show that the students had an average level of perceived academic self-efficacy and a moderate level of academic stress, concluding that it was not possible to establish statistically significant correlation between the two variables.

**Keywords:** *academic self-efficacy, academic stress, university students*

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## 1. Introduction

The review of literature in the Spanish language on the investigation in relation to the academic self-efficacy, it permits to acknowledge that this variable has been investigated in relation to other variables such as age [7], performing physical activity [2], academic achievement [11,17], for the realization of a thesis [22], positive and negative affect [24]; the involvement of parents [1], study habits [27], and attitudes towards the use of internet [21], among others.

Now in respect to the relationship between academic self-efficacy and stress in the work of Cabanach, Valle, Rodriguez, Pineiro and Gonzalez [10], which affirms a low sense of personal efficacy which appears frequently linked with high levels of anxiety and stress symptoms characteristic. Hernandez [16] found a positive correlation between these variables in technological higher education students in Mexico, presenting a medium level academic self-efficacy and academic stress a high level. Meanwhile, Barraza and Hernandez reported in 2015 [6], it was not possible statistically to determine a relationship between academic self-efficacy and academic stress on graduate students, presenting the first variable a high level and the second a moderate level.

Outside the academic environment there is other research that related to auto efficacy and it stresses by demonstrating the following results that were found below:

- Professors with a high level of self-efficacy and more resources to confront these problems suffer less stress and exhaustion than that of teachers with a lower self-efficacy and fewer coping resources [13].
- Perceived social support, self-efficacy and self-esteem are predictors of stress [15].

- Self-efficacy is a factor that protects against the experience of stress at work and therefore becomes less likely the presence of the burnout effect [26].
- There exists a negative relationship between the level of stress generated by the teachers, following the attention of students with special educational needs and the level of self-efficacy expectations presented by the same teachers on the proper care of these students [8].

With this as background, the object of study focuses on the Pedagogical University of Durango (UPD) located in the state of the same name in Mexico, being an institution of higher education that offer degrees, specialties, master's and doctoral related to the topic education. In this offer is a Bachelors Degree of Educational Intervention. (LIE) as a professional option for graduates of secondary education.

It is precisely in this degree where it has been observed a lack of confidence in students to obtain academic success, especially in the first semesters and it is believed that this may be due to other aspects, first one is stress generated by academic activities during the studying of a degree, including adaptation to change of an academic level to the workload from the university as well as the knowledge about classmates and teachers.

It is in this sense, that it has been decided to launch an evolutionary study aiming to investigate the academic self-efficacy (perceived) and academic stress variables, that arise through the following research:

What relationship is presented, if it is the case, between academic self-efficacy and academic stress of the students of the LIE, UPD 2015 cohort during the first three semesters of study?

Corresponding to the question to the research goal is: to determine the relationship if any occurs, between academic self-efficacy and academic stress of the students of the LIE, UPD 2015 cohort during the first three semesters of study.

In general the importance of the study is that through knowledge of both variables, it is possible to design strategies that help to increase the efficacy and decrease stress factors as discussed immediately, then are considered vital for the academic success.

## 2. The Academic Self-efficacy as Theoretical Framework of Research

Although the self-efficacy theorizing originated from the Social Learning Theory of Rotter was Albert Bandura in 1977 who developed broadly through its Sociocognitive Theory or Social Cognitive.

Blanco [9] affirm that from the Social Cognitive Theory two fundamental propositions emerge:

1. Self-efficacy beliefs are specifically given to a functional environment.
2. The construct of self-efficacy can be distinguished from other self-referential constructs when evaluated in relation to a specific domain.

The self-efficacy beliefs relate to each individual makes judgments about their capabilities to perform a task. Bandura (1997) [12] states that individuals possess an internal system that permit them to practice control over their own actions, behaviors and thoughts, this being a fundamental component system of influence in achieving the goals that everyone is proposed. The same Bandura (1997) [12] states that self-efficacy beliefs forms a decisive factor in achieving goals and individuals tasks. If people believe they have no power to produce results, they will not make the intent to this will occur.

In regards to the self-efficacy distinction from other self-referential constructs. Bandura (1997) [12] explains that self-efficacy beliefs differ from self-esteem, self-concept and value judgments that the subject has on its global image. While self-efficacy refers perception of specific skills, self-esteem has to do with value judgments to himself and self-concept "is the general perception of the individual about himself..." [25].

In another sense, the self-efficacy perception is a dynamic construct and therefore the perceived effectiveness tends to change over time as a result of new experiences that are lived in different circumstances and contexts where it requires particular skills influencing each individual's performance [12].

Paraphrasing Bandura [3], the self-efficacy perception is defined as the set of individual judgments about their own abilities to organize and execute actions or tasks needed in managing possible and specific situations possible. These judgments have important effects over the choice of conduct or activities, which employ effort, persistence, thought patterns and emotional reactions onto the tasks. It follows that if the subject is deemed able and confident in their abilities to execute a specific task, this self-perception contributes to the success of their performance, therefore arguably the expected success in achieving a goal relating to the direct outcome of expectations that the subject anticipates.

Following Bandura (1977) [9] self-efficacy is not a global trait but a joint set of self-beliefs linked to areas of distinguished performances. The theory maintains that individuals do not only make judgments on differentiated self-efficacy and differentiated for diverse domains, but

that self-efficacy can and should be define with different specific levels in relationship to a certain area, in a accordance to conduct, and criteria of interest.

Under this assumption is that one can speak of expectations of academic self-efficacy, which, to paraphrase Bandura (1997) [4] It can be defined as the students beliefs in their own capabilities by achieving their academic activities demanded of them in their school environment.

However, according to Schunk [25], individuals acquire feedback about their self-efficacy in determined area or task starting from their own executions (direct experiences, domain), from the model observations (vicarious experiences, modeling or learning by observation), from social persuasion form (verbal, symbolic) and index (activation state) physiological [25]; the first being the most influential source of information about the performance capabilities as when the foundation for the sense of self-efficacy of a person are their own actions and achievements, this foundation tends to generalize the range of similar activities (Bandura, 1997) [28].

In summary, based on all these sources that originate perceived efficacy beliefs, Bandura (1997) [12] states that: the extent to which the achievements are derived from an execution altering the perceived effectiveness that will depend on the preconceptions of the person in relation to their abilities, perceived difficulty in perceiving tasks amount of intended effort, their physical and emotional state at the current time, the amount of external aid they receive, and these circumstantial situations they carry out their actions.

### 2.1. Theoretical Research Hypothesis

The relationship of stress with self-efficacy has been explicitly recognized by Lazarus [20] main theoretical exponent of stress. However, beyond this acceptance, it has configured a model that explains the relationship between both variables and argues that self-efficacy is a "protective" factor or "buffer" of stress [13,26].

According to Schwarzer and Hallum [26], building self-efficacy suggests a protective effect when faced with adversity. One optimistic belief is in one's own competitiveness to confront daily challenges to increase the motivation to participate in constructive ways of confrontation. This assumption is also explained by Fernandez [14] as follows:

The conviction is to meet challenges posed by the task that are ahead, the sensation of possessing cognitive, social, emotional resources to resolve, and constitute a kind of potential stressful reducer effect, which allows an adequate performance and effective management of anxiety. The work-related self-efficacy as to fulfill this function.

## 3. Methodology

The present research was developed under the quantitative approach of a correction reach, non-experimental, since "... the scientist has no direct control over the independent variables because their demonstrations have already taken place or that are inherently non-manipulable" [19] and longitudinal or evolutionary, it is of interest "to analyze

changes over time of determined categories, concepts, events, variables, contexts or communities ..." [18]; being the month of December 2015 the first three applications with a bi annual periodicity: in December 2015, May and December 2016, which are the ending moments of the first three semesters of the study plan.

A decision was made to investigate until the third semester, because it is in these semesters where the students often have the highest academic difficulties.

The design is of the "evolution of groups" (cohort) because "changes over time at specific groups or sub-populations will be examined" [18], being the 2015 generation's cohort in the Bachelors Degree of Educational Intervention.

### 3.1. Research hypothesis

The general hypothesis of the evolutionary research is:

H<sub>11G</sub>: Students of the Bachelor Degree of Educational Intervention presents a negative relationship that gets stronger between academic self-efficacy and academic stress, according to the semester finalization of their studies.

Its counterpart is the null hypothesis is as:

H<sub>01G</sub>: Students of the Bachelor Degree of Educational Intervention not presents an increasingly strong negative relationship between academic self-efficacy and academic stress, as each semester end of their studies.

The semester that is particularly under review is the early stages of study, the research hypotheses are:

H<sub>11</sub>: The students present a high level of academic self-efficacy.

H<sub>12</sub>: The students present a high level of academic stress.

H<sub>13</sub>: There is a negative relationship between self-efficacy academic and academic stress shown by students.

The null hypotheses consist of previous denials which are defined below:

H<sub>01</sub>: Students do not have a high level of academic self-efficacy.

H<sub>02</sub>: Students do not have a high level of academic stress.

H<sub>03</sub>: A negative relationship doesn't exist between academic self-efficacy and academic stress shown by students.

### 3.2. Subject

The students subject to study add up to the whole generation of (cohort) of 2015 totaling 58, during the first semester of studies. The subjects were divided into two groups with the following characteristics:

- a) Group A: 31 students, 94% female and 06% male; age range of 18-24 years with an average of 19.81 years.
- b) Group B: 27 students, 7 % female and 22% male; age range of 18-25 years with an average of 19.71 years.

### 3.3. Techniques and Instruments for Data Collection

The technique utilized to collect data was the survey, and the instrument to research about academic self-efficacy was the Academic Self- efficacy Expectations Inventory [5], validated for the Mexican context,

consisting of 20 items that can be answered in a type scaling Likert four values: Nothing is secure, little is assured, secure and very sure; and within their parametric properties it has:

- A confidential level of .91 in Cronbach's alpha and .88 in the confidentiality by halves.
- A validation of acceptable content to obtain an overall average of 2.1 on a scale of 0-3.
- A validation of internal adequate consistency now that all items positively correlated (with a significance level of .00) with the overall score obtained by each respondent.
- An adequate analysis of contrasting groups now that all items permit discriminate (with a significance level of .00) between the groups report a high and low academic self-efficacy expectations.
- A three-dimensional structure, obtained via factor analysis explains 49% of the total variance: academic activities oriented to the production (output), the input from academic activities is for learning (input) and academic activities of interaction for learning (feedback).

On the other hand, the academic stress variable was investigated through a single item in which was asked about the students own evaluation on the frequency (on a scale of 1-10) in which experienced stress in the study period.

The decision to investigate the stress with a single question and consider mono-item variable reflects the fact that academic self-efficacy and academic stress have the same empirical reference domain, and the possibility of stress report (such as SISCO Inventory for studying academic stress, valid for Mexican context) this represents repeating empirical areas, in which brings us back to the questionnaire that is somewhat tedious and repetitive, that runs the risk of not being answered, or it would present a problem such as halo effect.

## 4. Results

In the following paragraphs the descriptive results for the variable "self-efficacy" are explained, just for its dimensions, as in general, mentioning that the measurement range is 0 to 3 points in both cases.

In the first term it has (in Table 1) showing the dimension results for "academic activities oriented to the production (output)". First, it can be noted that for both groups the two items with highest average were those referring to security to completing any academic work which was entrusted by the teacher (group A:  $\mu=2.61$ ; group B:  $\mu=2.59$ ), and security to "get organized properly to deliver the work on time ..." (group A:  $\mu=2.52$ ; group B:  $\mu=2.30$ ).

This indicates that the university students are perceived fully capable of any evidence requested of them, regardless of type, extension, aspects of content and quality they contain; suggesting that known (in general) the structure evidence is used majorly in the universities.

On the other hand, students trust in their organizational capacity to turn the evidences on time that was requested them, that means they have adjusted to the rhythm of school work and their own extra class rhythm, and are

able to establish a calendar and schedule (albeit informally) to properly distribute their time.

At cohort level, the averages for these items were 2.60 and 2.41 points respectively. In counterpart, the items with

the lowest average level cohort were "adapt to any style of teaching teachers" and "approve any evaluation process without even giving importance to the teacher or seminar", both with 1.86 points.

**Table 1. Descriptive statistics for the dimension "Academic activities oriented to the production (output)"**

Item	Group A		Group B		General	
	$\mu$	$\sigma$	$\mu$	$\sigma$	$\mu$	$\sigma$
Perform any academic work...	2.61	.846	2.59	.501	2.60	.528
Properly organize myself to submit on time the work...	2.52	.508	2.30	.724	2.41	.622
Adjust to teaching style of any teacher	1.81	.654	1.93	.675	1.86	.661
Approve any evaluation process...	1.97	.657	1.74	.712	1.86	.687
Understanding the different topics covered for the teacher...	2.00	.516	2.00	.620	2.00	.562
Build one's own arguments in written assignments ...	2.10	.539	1.92	.688	2.02	.612
Analyze and properly appropriating the different concepts and theories...	1.90	.597	1.85	.675	1.88	.629
Understanding the central idea of a text or the core aspects of exposure...	2.00	.516	2.04	.528	2.02	.517
<b>Average dimension</b>	<b>2.11</b>	<b>.604</b>	<b>2.04</b>	<b>.640</b>	<b>2.08</b>	<b>.602</b>

Source: Own elaboration.

The general average in this dimension was 2.11 points for Group A, 2.04 points for group B and 2.08 points for the cohort. These averages were converted to percent for purposes of interpretation according to a proposed scale by Barraza [5], equivalent to 70.33%, 68.00% and 69.33% respectively. The three levels, following the mentioned scale where from 67% is considered a high level, corresponding to a high level of self-efficacy, so that it can be stated just as much as in a group level as in a cohort level, the students presented a high level of confidence to successfully develop academic activities

oriented toward the production of information or evidence (output).

In regards to the dimension "input from academic activities is for learning", the items with the highest majority average resulted being what was referred to the security in finding the information to prepare an essay or an academic article and being secured to talking notes of the most important aspects in addressing teachers, with averages of 2.17, 2.31 and 2.23 points for group A, B and cohort, respectively in the first item; and 2.13, 2.54 and 2.32 points respectively in the second item indicated for group A, B and cohort (Table 2).

**Table 2. Descriptive statistics for the dimension "the input from academic activities is for learning (input)"**

Item	Group A		Group B		General	
	$\mu$	$\sigma$	$\mu$	$\sigma$	$\mu$	$\sigma$
Paying attention to the class...	1.94	.680	2.22	.801	2.07	.746
Commit more time to do my school work or study when so required	1.94	.629	2.08	.560	2.00	.598
Concentrate when I'm studying...	1.77	.717	2.12	.711	1.93	.728
Find the information necessary to produce an essay or academic article...	2.17	.461	2.31	.679	2.23	.572
Take notes of the most important aspects dealt with during classes...	2.13	.670	2.54	.582	2.32	.659
Use different strategies to achieve better learning	2.13	.562	1.96	.599	2.05	.580
<b>Average dimension</b>	<b>2.01</b>	<b>.620</b>	<b>2.14</b>	<b>.655</b>	<b>2.07</b>	<b>.647</b>

Source: Own elaboration.

In regard to these items, in which the students are assured that they have confidence and safety, so they can take notes in class, it means that the activity of systematization is dominated by students, in deducting that the majority of them have the capacity to extract and document in "real time" the most relevant information from the class.

In regards to the confidence to look for the information required to prepare an essay, or an academic article, which is a fundamental activity in the university, it can be interpreted as a high dominance in capacity, strategy and systematization for the search of reliable sources of information.

In addition to the above, only for the group A, the item "... use different strategies to achieve better learning" also resulted in an average of 2.13 points.

In counterpart to the previous items, those resulting in the lowest average at the cohort level in this dimension and they were the security to commit more time in completing school work... ( $\mu=2.00$ ) and security to concentrate when studying without being distracted by other things ( $\mu=1.93$ ).

The overall average for this dimension was 2.07 points cohort, 2.01 points for group A and 2.14 points for group B. The percentage equivalent level of these arithmetic means are 69.00%, 67.00% and 71.33%. All percentages are equivalent to a high standard, so that it can be started just as much as in a group level and as in a cohort level, students presented a high security to carry out the input from academic activity is for learning.

The third dimension of academic self-efficacy is the academic activities of interaction for learning, whose descriptive results are shown in Table 3, in which the items with the highest average for the group A were confident in asking the teacher, when something was not understanding which was addressed ( $\mu=2.16$ ), the confidence to make a good exposure ... ( $\mu=1.94$ ), and the confidence to compete academically with any fellow group members ( $\mu=1.94$ ). For group B the items with higher average scores were safety in asking the teacher when something was not understanding... ( $\mu=2.00$ ), and the assurance to work effectively in any team... ( $\mu=1.96$ ).

At a cohort level the items ask the teacher... ( $\mu=2.09$ ) and make a good exhibition... ( $\mu=1.93$ ) they resulted in

being one of the highest. The first of these (cohort) show that the students ensure to have confidence in expressing their doubts to the professor in respect to the subjects being addressed, those who can wait on a good environment of trust with both the professor and likewise with their fellow students. The second reflects the a sense of individual's growth of self-confidence regardless of the

context; but also it reflects the knowledge that is held between fellow students and the confidence to empathize with any of his colleagues to execute anyone of the activities. Definitely this ability is corresponding to socialization skills, the division of labor and a post reflection and integration to produce facts.

**Table 3. Descriptive statistics for the dimension "Academic activities of interaction for learning (feedback)"**

Item	Group A		Group B		General	
	$\mu$	$\sigma$	$\mu$	$\sigma$	$\mu$	$\sigma$
Work effectively on any team...	1.87	.846	1.96	.587	1.91	.732
Compete academically when so required...	1.94	.772	1.78	.698	1.86	.732
Participate actively contributing comments or theoretical support...	1.81	.543	1.74	.764	1.78	.650
Making a good presentation of a topic...	1.94	.629	1.92	.796	1.93	.704
Ask the teacher when I do not understand...	2.16	.735	2.00	.566	2.09	.662
Questioning the teacher when I do not agree with exposing	1.39	.667	1.69	.928	1.53	.804
<b>Average dimension</b>	<b>1.85</b>	<b>.699</b>	<b>1.85</b>	<b>.723</b>	<b>1.85</b>	<b>.714</b>

Source: Own elaboration.

As for the items with lowest average cohort level to this dimension, it was obtained 1.78 and 1.53 points respectively, security to participate actively providing comments or theoretical support.... and confidence to questioning the teacher when are not agreeing to what is being explained.

A general level is as much as for group as is at the cohort level, the average measurement was 1.85 points equivalent to 61.66%, which means that the students presented an average level in referring to the confidence in executing the interaction activities or feedback for learning.

The average of the three dimensions represents the overall average of the academic self-efficacy variable that is perceived, which for group A was 1.99 points ( $\sigma=.308$ ) for group B, it was 2.00 points ( $\sigma=.400$ ) and level cohort, 1.99 points ( $\sigma=.351$ ). The equivalent percentages of these averages are 66.33%, 66.66% and 66.33% respectively, finding everyone in higher limit of the average level (66%), even though near they are higher level (67%), it can affirmed that the students from each group and a cohort level presented an average level of perceived academic self-efficacy.

As for the second variable principle of this research, academic stress, was obtained for the group A an arithmetic median of 5.68 points ( $\sigma=2.13$ ), for group B an average of 5.52 points ( $\sigma=2.44$ ), and a cohort level of an average of 5.61 points ( $\sigma=2.25$ ). For the interpretation of these values, they are converted by simple rule of three to share, being 0-33% a mild level of stress, 34% to 66% a moderate level and 67% to 100% a strong level, for what can be confirmed from the college students shown having experimented an average or moderate level of academic stress: 56.8% for group A, 55.2% for group B, and 56.1% to cohort level.

### 4.1. Correlational Analysis

The most important purpose of this stage of evolutionary research that is done on the students to determine whether a negative relationship exists between self-efficacy and academic stress on the students. For that reason Pearson's  $\rho$  statistics were used like a testing measurement which the results are shown on Table 4.

**Table 4. Correlation result of academic stress with academic self-efficacy and its dimensions**

No	Academic self-efficacy	Level of correlation with academic stress
1	Dimension input	-.159
2	Dimension output	-.124
3	Dimension feedback	-.234*
4	Overall result of perceived selfefficcy	-.214

\*Correlation significant at the 0.05 level.

Source: Own elaboration.

As noted, it was only able to establish a correlation between the variables (statistically at significant level of 0.05) in a feedback dimension, although it is considered not as strong [23] it allows to state that a higher feedback exist as a means to learning, the academic stress level experienced from the students is less, and that a higher academic stress, is less the interaction presenting by students among themselves and with teacher.

For the rest of the dimensions and to the general level of academic self-efficacy was not possible to establish a statistically significant relationship with academic stress.

students presented a high level such in the confidence to successfully develop academic activities aimed at producing information (dimension output), as unto the security to carry out academic activities for learning input (input dimension). Regarding the confidence to carry out interaction activities (dimension feedback), an average level was presented. With this, albeit actually near to the high level, students had an average level of perceived academic self-efficacy.

With regard to the academic stress, cohort level averaging 5.61 points was obtained, equivalent to a medium or moderate level.

With this, it was possible to determine the rejection of the research hypotheses Hi1, Hi2 and Hi3, so their null counterparts are accepted, accepting in this way that students did not show a high level of academic self-

## 5. Conclusions and Discussion

Particularly for the semester discussed in this first stage of the study, the general results (cohort) show that

efficacy; also accepting that students did not show a high level of academic stress, and also accepting that there is a negative relationship between academic self-efficacy and academic stress presented by the students, and only in the dimension "feedback" was able to find this relationship, but not so in academic self-efficacy globally.

These results of no relationship between the variables differ from those presented by several researchers, including Cabanach et al. [10] who they claimed that a low sense of personal efficacy appears frequently associated with symptoms typical of stress. Hernandez [16] reported a positive relationship between the two variables in college students; Gonzalez and Landero [15] indicated that the perceived social support, self-efficacy and self-esteem are predictors of stress. Hallum and Schwarzer [26] explained that self-efficacy is a factor that protects against experience stress at work and therefore becomes less likely the presence of burnout; while Barraza, Cardenas and Ceceñas [8] found a negative relationship between the level of stress generated in the teachers that care for students with special educational needs and the level of self-efficacy expectations presented by these same teachers on the proper care of these students.

In contrast to the above, the result is coincident with Barraza and Hernandez [6] who did not identify a relationship between perceived academic self-efficacy and academic stress in graduate students in Mexico, presenting the first high level and the second a moderate level.

The no coincidence with the mentioned studies can be explained from the conceptual approach that stress was addressed in these investigations, this being centered stressors or sources of stress, which differs in conceptualizing considered in this study, which is the under stress symptoms centered approach, and justly like was considered by Barraza and Hernandez [6], whose research results matching this was considered.

With the above, it has completed the first phase of the study, the results should be compared when the cohort finish the second semester of their curriculum.

Finally, the generalization of these results to larger populations should be approached with caution because of the limitations of this research is the size of the population, 58 individuals, which is sufficient for the purposes raised, but not to establish the behavior of the variables involved would be the same in larger universes, so these results should be interpreted only as a reference.

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