Academic Self-efficacy and Learning and Study Strategies: Brazilian students’ perceptions

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Abstract: The objective of this study was to analyze the correlations between Academic Self-Efficacy and the use of Learning and Study Strategies of Brazilian high school students, considering the specific characteristics of each grade, each period, and the conditions about students who also work or not. 534 high school students from nine public schools participated in this research. The following instruments were used: High School Students Academic Self-Efficacy Scale and Learning and Study Strategies Inventory, having used its dimension named Information Processing. Results presented positive, significant and moderate correlation between Academic Self-Efficacy and Learning and Study Strategies. The correlations showed a difference of intensity when considering the school grades, periods and whether the students also worked or not. For the Brazilian sample, Academic Self-Efficacy is associated with the prediction of actions towards the use of Learning and Study Strategies. Important educational implications shall be discussed.

Key-words: Self-Efficacy; Study Strategies, High School, Motivation

INTRODUCTION

The belief of academic self-efficacy has been identified as a predictor of desirable actions to promote school learning. Studies have demonstrated that students with high perception of academic efficacy are more cognitively engaged during classes, and this fact helps them to develop educational competencies. They are also more persistent against school challenges, besides demonstrating higher availability for tasks related to studying even when there are other social activities to do. However, the belief of academic self-efficacy involves something bigger than the perception that effort can conduct to success. It encompasses the judgments about one’s knowledge, one’s capabilities, the strategies one dominates, and the way one uses them in order to manage the stress related to the educational tasks, affecting the students’ aspirations and their levels of interest in intellectual subjects, mediating, thus, the motivation to learn. (Bandura, 1993; 1995; Zimmerman, 1995).

High levels of academic self-efficacy have also been associated to the capacity of learning to learn, so necessary these days. The setting of learning objectives, self-monitoring and self-evaluation are
actions that guide the process of learning how to learn, and these processes enable the self-judgment about one’s understanding regarding the learning that occurred. Students who perceive themselves more capable tend to understand that skills can be built, and they self-regulate their own process of learning. To do so, they select and use diverse learning strategies, trying to find the most appropriate one for each kind of activity to be developed (Bandura, 1993; 1995; Zimmerman, 1995).

Metacognitive strategies are fundamental to self-regulated learning, because they provide the selection of the appropriate strategies, test the individual comprehension about one’s own knowledge, allow the corrections of the individual weaknesses and the perception of the cognitive strategies (Boruchovitch, 2004). There are diverse strategies which are characterized by different types due to the cognitive resource applied by the student, especially the ones denominated information processing (Boruchovitch, 1999). Pozo (1996) defined that study strategies refer to the means or ways the students use to learn or as a sequence of planned activities performed by the subject in order to learn something.

In the research made by Bartalo (2006) the verification of the use of the information processing strategy by the students consisted of evaluating the “use of imagery and verbal elaboration, monitoring of comprehension and reasoning”, and also, “the building of bridges between what the student already knows and what he is trying to learn and remember”. This has as steps the “processes of acquisition, retention and future application of new knowledge and information” (p.75). The operational way these study strategies can be performed requires from the student the use of meaningful and organized means, for example, to paraphrase and summarize texts, or even to elaborate analogies, notes and schemes, as well as the use of analytical, inferential and synthetic thinking.

Valle and colleagues (2009) indicate the need for the students to become more strategic with their studies, so as to act intentionally and achieve the expected results. These authors investigated students from 12 to 16 years old from secondary school in Spain. They used instruments to verify cognitive strategies (selection, organization, elaboration and memorization of information) and self-regulation strategies (planning and supervision-revision); also, they used students’ academic achievement through the grades from varied school subjects. Among the results, a higher use of different cognitive and self-regulatory study strategies brought a positive consequence and improvement in academic performance. In contrast, a lower use of these is associated with lower levels of academic performance.

Another study that associated study behavior and academic performance was developed by Rosario, Ferreira and Guimarães (2001). It was observed that the students with high performance presented a different study profile from the others. They found that they present deep motivation to learn, which is centered in the understanding of the information in a general way and supported in strategies that allow them to reach their objectives. The researchers state that one reason that makes a strategy to be operational is set in a deep approach, not a superficial one, instead. The results of this investigation reinforce the idea of understanding why the students study and how they do it either for building knowledge or school success.

The use of study strategies seems to be a promising way to make learning happen. The mastery and use of different strategies bring benefits for the learning process, which have been approached by several authors (Rosário, 2001; Rosário, Ferreira e Guimarães, 2001, Souza, 2010, Valle et al. 2009, Bartalo, 2006, Pozo, 1996). Motivational factors have been associated to the use or not of study and learning strategies, and among these, there is academic self-efficacy.

Souza (2010) affirms that self-efficacy is one of the constructs most associated to the use of study and learning strategies. The reason for this comes from the fact that students with high self-efficacy demonstrate positive expectations to their own academic results, which push them to make efforts to find
more favorable strategies for the execution of the different school tasks, even in the presence of difficulties.

Regarding self-efficacy, Azzi and Polydoro (2010) discuss that when people believe that their actions can produce desirable attainments, they feel motivated to act and persist when they face potential obstacles. It is possible to bring this focus for the school context, which may require diverse study strategies, especially when the young is confronted with a new level of study, namely, high school. Nevertheless, it is important to alert that the academic self-efficacy belief by itself does not guarantee school learning. Self-efficacy has been shown to predict the necessary behavior for such learning to happen, but if the student does not have the skills and knowledge that constitute the prerequisites to learn, it will not be enough for this student to believe in his own capacities, because he will act towards this learning without success (Bandura, 1993; Schunk, 1995; Zimmerman, 1995).

The student’s self-efficacy belief is built along his school life, through the interpretation of his own school attainments and the dedicated behavior to these achievements. It is also built by interpreting the answers that are provided by his peers, teachers and other educational agents, which constitute the environmental influences.

It can be also mentioned that this belief is not static. It is different across time, because the self-efficacy belief may present oscillations, becoming stronger or weaker, demonstrating thus the dynamic feature of the belief. Azzi, Guerreiro-Casanova e Dantas (2010), warn that, because specific tendencies for each grade have been observed, there is the necessity of increasing the understanding about the academic self-efficacy under the proper characteristics of each year of high school, which can help the development of pedagogical actions.

According to Bandura (1993; 1997) the self-efficacy belief exerts influence in one’s development path. That could mean that the reflex effects of academic self-efficacy are demonstrated besides the behaviors related exclusively to learning tasks. Pro-social postures, with standards of desirable interpersonal and emotional behavior are associated with the strong intensity of academic self-efficacy belief. The opposed belief is related to harmful behavior, verbal and physical aggression (Bandura, 1993; 1997; 2006).

The occupational aspirations and the processes that guide the career decision are also influenced by the belief of academic self-efficacy (Brown & Lent, 2006). This belief has been shown to be a better predictor of career decision than the facts related to the socioeconomic aspects. In the final years of basic education, it has been demonstrated that the male students see themselves more self-efficacious than female students (Faria, Taveira & Saavedra, 2008). The experience during the three years of high school seems to alter the students’ perception concerning the capacity to plan actions to achieve professional objectives, which becomes stronger along the school years (Azzi and colleagues, 2010).

From what was exposed, it is possible to see the important contribution of academic self-efficacy for the activities that are related to learning, and among these, the use of study and learning strategies. However, the correlation between academic self-efficacy and the use of study and learning strategies is still incipient in the Brazilian context, especially for the high school years. The objective of this research was to analyse the correlations between Academic Self-Efficacy and the use of Study and Learning Strategies from public high schools located in an important State in Brazil. As specific objectives, analyses were made of the correlations between Academic Self-Efficacy and Study and Learning Strategies considering the particular features of each year of high school and the students’ condition about whether they also have a paid job or not. It is important to clarify that this study delimitates academic self-efficacy as the domain referring to the student’s perception in relation to the perceived confidence in
the capacity of organizing and executing required courses of action to produce certain attainments regarding the educational formation. It is considered, therefore, the students’ perceptions about their own capabilities related to learning tasks, perform school life and career choice.

METHOD

Participants

This study was developed in nine public schools in the State of São Paulo, Brazil. In order to obtain diversity in the sample, schools in several different regions of the State were invited, in a way that big cities and small towns could be represented, in the interior of the State. The participation of the schools was assured after the authorization issued by the principal, through an Authorization Letter.

For this research, 534 high school students participated, being 64.6% (n = 345) female. From the whole sample, 183 students were taking the first year of high school, 192 the second year, and 153 the third and last year. About the age, the sample had students between 14 and 24 years old. In the first year, 25.1% (n = 14) of the students were 14 years old, 60.1% (n = 110) were 15, and 14.8% (n = 27) were between 16 and 19 years old. In the second year, 27.6% (n = 53) of the students were 15 years old, 52.1% (n = 100) were 16 and 20.3% (n = 39) were between 17 and 19 years old. In the third year, 28.1% (n = 43) were 16 years old, 51.6% (n = 51) were 17 years old, and 17% (n = 26) were between 18 and 19 years old, and 3.3% (n = 5) were between 20 and 24 years old. All participants who were under the age of eighteen were authorized by their parents and/or responsible to participate in the study through the signature of a Free Informed Term of Consent. For the participants who were over 18 years old, it was asked them to grant permission by signing the Free Informed Term of Consent.

From this sample, 51% (n = 272) went to school in the mornings, 41.1% (n = 219) in the evenings, and 7.9% (n = 42) in the afternoon. Basically, all the students who participated in this study intend to finish high school (99.6%, n = 529) and enter in higher education (93.4%, n = 499).

As to the condition of having a paid work, 30.8% (n = 163) of the students plead to be workers. From these, 42.2% (n = 70) said to work full time, 39.2% (n = 65) said to work part time and 18.7% (n = 31) said they did not have a fixed working schedule.

Materials

For this research three instruments for collecting data were used, which are the following:

1) Characterization questionnaire: this instrument was elaborated by the researchers, with the objective of obtaining information about the personal characteristics of the students who participated in the research, such as, age, sex, year, period and working condition.

2) High School Academic Self-Efficacy Scale: this scale was developed from the Higher Education Academic Scale (Polydoro & Guerreiro-Casanova, 2010), and was submitted to necessary adaptations of language and context for the understanding of high school students. After this initial adaptation, it was realized the process of spoken reflection with 10 high school students, in which their opinion was asked about the comprehension of the items that integrated the scale and about the applicability of these items to high school educational context. This procedure promoted small adjustments in the writing of the items of the scale. After the evaluation of the psychometric properties,
the scale was set with 16 items. The Scale presented internal consistence of 0.886. The items were organized in three dimensions, as observed in Figure 1.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Meant to understand</th>
<th>Number of items</th>
<th>Example of item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Efficacy to learn</td>
<td>Perceived confidence in the capacity of making efforts to get involved in school activities, considering the cognitive, motivational and behavioral aspects related to the process of learning and academic performance.</td>
<td>8 items</td>
<td>How much can I motivate myself to do the activities/tasks related to this school subject?</td>
</tr>
<tr>
<td>Self-Efficacy to perform school life</td>
<td>Perceived confidence in the capability of performing school life, considering the collaborative engagement with peers and the school/institution</td>
<td>4 items</td>
<td>How much can I contribute with ideas to improve my school?</td>
</tr>
<tr>
<td>Self-Efficacy for choosing career</td>
<td>Perceived confidence in the capability to search information and plan relevant actions for deciding a career.</td>
<td>4 items</td>
<td>How much can I define with security what I intend to follow as my profession among the several existing diverse possibilities?</td>
</tr>
</tbody>
</table>

Figure 1 – description of the dimensions of the High School Academic Self-Efficacy instrument.

In order to answer them, the students were guided to think about the current school situation. Then, the respondents had to indicate how much they could perform the proposed situation in each of the items, ranging from 1 for the least capable to 7 for the most capable.

(3) Learning and Study Learning Strategies Inventory. This instrument was originally elaborated by Weinstein e Palmer (1990) and after, it was translated into Portuguese from Portugal by Figueira (1994). In Brazil, it was translated and validated by Bartalo (2006). For the present research only the dimension Information Processing was used, which can be observed in Figure 2. It is composed by 12 out of 88 items of the mentioned instrument. This dimension presents internal consistency of $\alpha = 0.82$. 
<table>
<thead>
<tr>
<th>Dimension</th>
<th>Meant to understand</th>
<th>Exemple of item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Processing</td>
<td>Identify the use of verbal and symbolic strategies, the monitoring of comprehension</td>
<td>I try to identify the main ideas when the teacher of this school subject is teaching.</td>
</tr>
<tr>
<td></td>
<td>and thinking, as well as the establishment of bridges between what they know and what</td>
<td></td>
</tr>
<tr>
<td></td>
<td>they are trying to learn and remember.</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2. Description of the Information Processing dimension from the Learn and Study Strategies Inventory.

Before starting to answer to the dimension of the Learn and Study Strategies, the student was explained to think about his usual behavior related to the strategies mentioned in the instrument. In order to respond, the student could choose from 1 to 5, meaning that 1 represented the behavior never performed by the student, and 5 the behavior always performed by the student during his study and learning activities.

**Procedures**

The research project was submitted to the Research Ethics Committee of Campinas State University and after its approval (letter nº1185/2009) the data was collected. The researches contacted the Boards of Education and the responsible in command of the schools with the purpose of presenting information about the objectives of the research and ask authorization to collect data. The schedule was organized according to the availability of the Portuguese teachers, because the students had to answer the instruments during the classes of this school subject.

The researchers went to the respective schools in the scheduled days. They introduced themselves and invited the students to answer the instruments. Initially, the students were invited to voluntarily participate. They were explained about the content of the research, that data would be kept confidential and with either no harm for the ones who participated, or benefits for those who decided to respond. Those students who accepted in taking part in the research were explained to take the Free Informed Term of Consent to their parents or so to be signed and brought back to the researchers the following day, so that they could answer the instruments. The collection of data was collectively made, inside the classroom, during the class of Portuguese. The students were oriented to answer the questions of the instruments according to with their perceptions about that school subject. The participants answered the three instruments following the same order, starting with the Characterization Questionnaire, then High School Academic Self-Efficacy Scale, and finally Study and Learning Strategies Inventory. The instruments are self-explainable, however, the researcher stayed inside the classroom in order to clarify possible doubts. There was no time limit to answer, therefore, the average time was 20 minutes. The collection of data happened in only one meeting with the different groups because of the school year and period. It happened between the months of April and August 2010.

**Data analysis procedure**
The protocols answered by the students were visually checked by the researchers to see if all the answers were completed. The ones that were had less than 90% answered were discharged. The answers were inserted in the statistic program SPSS (version 18.0) and 20% of the sample was randomly checked. It was verified that the data was non-parametric by the Kolmogorov-Sminov test, and the Spearman correlation test was applied among the variables according to the objectives, besides the descriptive data of the characterization.

RESULTS

The results are presented below starting from the correlations between Academic Self-Efficacy (SE) (total result, self-efficacy to learn, self-efficacy to perform school life and self-efficacy for career decision), and Study and Learning Strategies (SLS), followed by the correlations according to with the school year, the period of study and the students’ conditions about working. It is interesting to clarify that the strength of the correlation discussed here was classified as: weak ($\rho \leq 0.399$), moderate ($0.400 \leq \rho \leq 0.699$) and strong ($\rho \geq 0.700$) (Dancey & Reidy, 2006), and all correlations found were positive and significant. It is worth mentioning that the answers given by the students were based on the Portuguese school subject.

<table>
<thead>
<tr>
<th>Study and Learning Strategies</th>
<th>Academic Efficacy</th>
<th>Self-Efficacy to learn</th>
<th>Self-Efficacy to perform school life</th>
<th>Self-Efficacy for career decision</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.638**</td>
<td>0.648**</td>
<td>0.394**</td>
<td>0.494**</td>
</tr>
<tr>
<td>1st year</td>
<td>0.648**</td>
<td>0.607**</td>
<td>0.449**</td>
<td>0.493**</td>
</tr>
<tr>
<td>2nd year</td>
<td>0.678**</td>
<td>0.682**</td>
<td>0.386**</td>
<td>0.574**</td>
</tr>
<tr>
<td>3rd year</td>
<td>0.602**</td>
<td>0.651**</td>
<td>0.375**</td>
<td>0.417**</td>
</tr>
<tr>
<td>Morning</td>
<td>0.624**</td>
<td>0.558**</td>
<td>0.350**</td>
<td>0.470**</td>
</tr>
<tr>
<td>Afternoon</td>
<td>0.718**</td>
<td>0.841**</td>
<td>0.509**</td>
<td>0.624**</td>
</tr>
<tr>
<td>Evening</td>
<td>0.629**</td>
<td>0.660**</td>
<td>0.427**</td>
<td>0.503**</td>
</tr>
<tr>
<td>Works</td>
<td>0.676**</td>
<td>0.712**</td>
<td>0.447**</td>
<td>0.571**</td>
</tr>
<tr>
<td>Does not work</td>
<td>0.619**</td>
<td>0.618**</td>
<td>0.363**</td>
<td>0.461**</td>
</tr>
</tbody>
</table>

Table 1 - Correlation between Study and Learning Strategies (SLS) and Academic Self-Efficacy (SE) – general result, by school year, by period and by working condition. (***p < 0.0001)

It was observed that the correlation found between Academic SE and SLS was weak only for the dimension “perform school life”. About the correlation between total Academic SE and SLS, it was moderate for the dimensions “learn” and “career dimension”, having “learn” a higher score between these two. These correlations were significant.

As can be observed in Table 1, the correlation between Academic SE with SLS was moderate, positive, and significant for all school years. The dimension SE to learn also presented moderate, positive
and significant correlations with SLS for all school years. The dimension SE to perform school life presented moderate correlation with SLS for the first year students, and demonstrated weak correlation for second and third year students. The dimension SE for career decision presented moderate correlation with SLS for all school years.

The correlations between Academic SE and SLS was positive and significant for all periods, as seen in Table 1. In this same Table, it is possible to verify that the correlation between SE and SLS was moderate for the afternoon and evening periods, being the latter one strong. The dimension SE to learn, presented moderate correlation with morning and evening periods, with strong correlation with the afternoon period. The dimension SE to perform school life presented weak correlation with the morning period, but moderate with afternoon and evening periods. The dimension SE for career decision had moderate correlation with the three school periods.

The correlations between Academic SE and SLS was positive and significant for students who work and for the students who do not. The lowest correlation was between SE to perform school life and SLS, either for the students who work (moderate correlation) or for those who do not (weak correlation). The only strong correlation found was between SE to learn and SLS for the students who work. Generally, the students who work presented higher correlations between total SE and SLS and its dimensions.

**DISCUSSION**

Overall, the results found in the analysis between Academic SE and SLS Strategies indicated positive and significant correlations with moderate magnitude in Academic SE, SE to learn and SE for career decision ($\rho = 0.638, 0.648 \text{ e } 0.494$, respectively), which suggests that those students who judge themselves academically more capable, also use study and learning strategies for the Portuguese subject more intensively. These findings reinforce the data found by Neves and Faria (2007). The authors investigated Academic Self-efficacy of Portuguese and Math in 207 students from the 9th and 10th school year in a city in Porto. They used instruments to analyze self-efficacy, the causal attributions and academic performance in these two school subjects. The results found revealed significant and positive correlations between self-efficacy and school achievement. Thus, it seems that academic self-efficacy exerts a relevant role in the motivation and school accomplishment. This role is in a way that psychopedagogical interventions can be planned towards creating conditions to promote motivation and school achievement driven to specific and related domains. These conditions must be realistic, and promote the use of learning strategies which are adequate to the task.

When considering specifically the correlation between SE for performing school life with SLS, weak intensity was observed (0.394**). This low intensity may be a result of the inexistence of items to measure the study and learning strategies that consider learning strategies performed cooperatively with one or more peers. The dimension SE for Performing School Life is meant to verify the students’ perceptions about, for instance, the capability to work in groups or ask for help for a colleague, in a way to consider the necessary attitudes to learning, considering the social and interpersonal aspects that surround the learning, as suggested by Bandura (1993;1997).

Regarding the correlations verified between SE and SLS according to the school years, it was found positive and significant correlations for all of them. Only the dimension SE to perform school life presented differences of intensity for the years, being moderate in the 1st year, and weak for the 2nd and 3rd years. This result indicates the importance of investigating the aspects which are involved in the lowering
of the intensity of this correlation. This dimension analyses the perception of the capacity about the aspects involved in performing school life (working in groups or search information about the infrastructure and facilities of the school the student goes to) therefore, related to social life. The instrument that was used in this research to identify the use of SLS has only items related to learning strategies that are developed individually, and this might have contributed to lower the observed intensity.

When the correlations between the periods were analysed, it was observed that the evening students (strong correlation) demonstrated a more intense correlation between Academic SE and SLS than the morning students (moderate) and the afternoon ones (moderate) in all dimensions. In this regard, it is important to consider that the self-efficacy perception is built by contextual issues, so that, eventually, the environmental conditions that are different in each period (for example, different school agents, less researched students in the evening) might have contributed to raise the intensity of the observed correlation. It would be interesting to analyze whether those differences in intensity of the correlation may be associated to the students´ working condition. From the information gathered, 42.2% (n= 70) of the students work full time, which allowed to infer that they went to school in the evening. Also, 39.2% (n = 65) of the respondents said to work part time but there was no possibility to understand whether they went to school in the mornings or afternoons.

The correlations found between the variables researched considering the condition of working or non-working students were all positive and significant as well. When compared, a difference is observed, because there are more intense correlations when considering the working students. It is important the strong correlation observed between Academic SE and SLS for the condition of the working students, what seems to indicate that they use more those strategies as more self-efficacious they become. The correlations observed between SE for career decision and SLS were moderate for both the working and non-working students. The experience with a working activity may represent clearer objectives for one’s personal aims. It may also contribute to greater efforts towards the achievement of goals, for example, the exercise of studying. Rosário and colleagues (2006) propose that helping the students to design possibilities and realistic professional proposals is an important educative feature, associated with thinking about a challenging future, in order to make the student manage his school life and build his own school path. The authors state the need of going beyond helping them solve problems, but to give them a sense of being able to change the course of unsuccesses, with a more preventive rather than remedial attitude.

**CONSIDERATIONS**

The perception of Academic SE and the use of SLS seem to be relevant constructs in the context of the Portuguese classes, as investigated here. It is important to be aware about the clarity and objectiveness of the definition of these constructs, and the specificity of the domain to be investigated. This is proposed by the study of Torres and Neves (2010) that investigated these constructs associated to school performance with elementary students in the city of Braga. The results indicated that there may be influence of use of learning strategies when forming efficacy expectations, being significant when it is considered self-efficacy in Portuguese and not in Math because they can differ as to the use of strategies. They also mention that the expectations of academic efficacy towards the specific attainment domains that were studied (Portuguese and Math domains) influenced in a positive and significant way the score to Portuguese and to Math.
In the correlation between Academic SE and SLS under the focus of the school years, it is pointed out the decrease of the intensity of the correlation about SE to perform school life from the 1st year to the 2nd and 3rd ones. Besides the considerations already made about the instrument, it is worth investigating about the practices of incentives for the execution of collaborative and participative activities, considering peers and the school context, corroborating Azzi and colleagues (2010).

When considering the focus of the school period, the correlation found between Academic SE and SLS seems to indicate that the time the students go to school has to do with the motivation to learn. It is stressed the need of considering the environmental and contextual differences for each period, for the realization of the pedagogical activities developed in the classroom and/or at school.

The students’ condition about working or not seem to be an important variable about the aspects of perceived SE and the use of SLS, once the observed correlations for these were more intense. As mentioned before, researches have highlighted the contribution of academic SE for career decision (Brown & Lent, 2006; Faria, Taveira & Saavedra, 2008), over other aspects, as the socioeconomic one.

As to limitations, it can be mentioned that the sample does not represent the whole diversity of Brazilian public schools. The range of this sample was limited by the difficulty to obtain authorization from parents or responsible for the students who are under 18 years old.

As to contributions, the correlations of this study indicate that also in the Brazilian population, the belief of Academic SE is associated to the prediction of actions toward the use of SLS. From the obtained results, important educational implications must be discussed for the Brazilian reality.

ACKNOWLEDGEMENTS

The authors Roberta Gurgel Azzi e Daniela Couto Guerreiro Casanova acknowledge The State of São Paulo Research Foundation – FAPESP.

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