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Artículos de investigación científica y tecnológica

MESSAGES OF SELF-REGULATION FOR LEARNING IN NINTH GRADE STUDENTS AT COLEGIO CUNDINAMARCA IED IN BOGOTA

MENSAJES DE AUTORREGULACIÓN DEL
APRENDIZAJE EN ESTUDIANTES DEL GRADO
NOVENO DEL COLEGIO CUNDINAMARCA IED EN
BOGOTÁ

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Resumen: El propósito de este estudio fue analizar las cualidades psicométricas del Cuestionario de Mensajes Autorregulatorios (CMA) en 40 estudiantes del grado noveno del Colegio Cundinamarca IED en la ciudad de Bogotá. Se adoptó por un diseño no experimental cuantitativo que pretendió observar el fenómeno de la autorregulación del aprendizaje en su contexto natural. Los principales hallazgos revelaron la existencia de una correlación significativa entre el desempeño y el control de las emociones. Esto permitió reconocer que los estudiantes con una baja autorregulación emocional están asociados a altos indicadores de fracaso en tareas y actividades y que las actividades que suelen generar efectos negativos en las emociones de los individuos suelen desembocar en una sistemática evitación.

Palabras clave: self-regulation of learning, education, youth, self-messages, autorregulación del aprendizaje, educación, jóvenes, auto-mensajes.

Abstract: The purpose of this study was to analyze the psychometric qualities of the Self-Regulatory Messages Questionnaire taken by forty ninth-grade students at Colegio Cundinamarca IED in the city of Bogota. A quantitative non-experimental design was adapted with the aim of observing the phenomenon of self-regulation for learning in its natural context. The main findings reveal the existence of a significant correlation between performance and control of emotions. This allowed to identify that students with low emotional self-regulation are associated with high indicators of failure in tasks and activities, and that said failures tend to drive negative effects on individuals' emotions, subsequently leading to systematic avoidance.

Self-regulation for learning; education; youngsters; self-messages.

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Keywords: Self-regulation for learning, education, youngsters, self-messages.

INTRODUCTION

Developing processes of *self-regulation for learning* has become one of the main challenges and goals of contemporary education. Currently, many educational institutions promote specific forms of control and guidance of cognitive and motivational processes in students' educational paths (Ader, 2019). This has produced a prompt increase in research

studies about the ways in which teachers implement novel approaches and methods in the classroom, and of impacts which said pedagogical transformations have caused in active intervention processes that students follow to attain their learning objectives and academic success (Boekaerts, Pintrich & Zeidner, 2000; Mega, Ronconi & de Beni, 2014; Spruce & Bol, 2015).

Current discussions on the recent academic interest, such as that by Rosário et al. (2014) about the study of *self-regulation for learning*, concur in suggesting that progressive social and educational acknowledgement of subjects as *active agents* or *participants* of cognitive, motivational and behavioral processes in the learning process has enabled the gradual emergence of studies on self-regulation (Pintrich, 2000; Ruban & Reis, 2006; Zimmerman, 2008; Muñoz, 2020). Nowadays, it can be stated that considering the dynamic role of the subject in the teaching-learning process has favored the adoption of theoretical stances related to constructivism, which regards students as “self-regulated” apprentices to the extent that they were being accepted as *active* metacognitive, motivational and behavioral participants of their own learning (De Corte, Verchaffel & Eynde, 2011; Zimmerman, 2001; Gonzalez, 2020).

With recent years’ key changes in the subject’s role, there has been an increased need to focus educational objectives on helping students to become autonomous and self-regulated apprentices (Föster, 2018; Panadero, 2011). For teachers, this entails *educating the students* to self-regulate their own learning in order to boost skills in the academic environment which benefit objectives’ achievement (Aguilar, 2020). In other words, it implies contributing in the construction of educational subjects-agents who are aware of “what, when, how, why and what for in terms of learning” (Panadero, 2011, p.3). In the end, this translates into getting subjects to be able to self-regulate learning throughout their extensive school trajectory (Cabero-Almenara, 2020).

According to Panadero (2011), *self-regulation for learning* is a complex process that has been defined as the control that subjects exercise “over their thoughts, actions, emotions and motivations through strategies to fulfill the objectives they have set for themselves” (p.11). The aforementioned contemplates, on the one hand, *control of thoughts and actions*, i.e., the cognitive component, frequently called *metacognition*, and the behavioral component realized to reach objectives. On the other hand, it comprises *control of emotions* since its centrality for learning has recently been acknowledged. Moreover, according to Panadero (2011), it includes *control of motivation*, which refers to “*being self-motivated* for a task and sustaining focus and interest throughout its execution applying strategies” (p.11), with the purpose of reaching the objectives set in the beginning.

Thus far, this study tried to understand self-regulation for learning through messages that students send themselves while executing a task (Panadero, 2011; Wolters, 2003). Therefore, it is about inquiring into the thoughts going through the students’ heads that enable them to sustain the concentration and interest while developing the activity.

Consequently, it can be suggested that some thoughts going through students' heads while engaged in a task are usually expressed as *self-messages* that strategically intervene and control their behavior and motivation towards attaining learning (Corno, 2008; Schunk, 2001). In many cases, these messages exteriorize and reinforce students' success or failure expectations regarding learning (Schunk, 2012; Wolters, 2003).

Exploring and analyzing self-messages is critical to control thoughts and their interference with learning (Dignath & Büttner, 2008; Kuhl, 2000); especially, based on their function while self-regulating behaviors, supervising goals and reinforcing all kinds of positive or negative emotions that might favor the fulfillment of objectives (Ruiperez-Valiente, 2020). In that sense, the study's objective was to analyze the qualities of the Self-Regulatory Messages Questionnaire, applied to a sample of ninth-grade students at Colegio Cundinamarca IED, with the aim of assessing opinions and attitudes that arise as self-messages in students' minds while conducting any kind of task or activity.

METHOD

The study adopted a quantitative non-experimental design. It is defined as a research approach that takes place without deliberately manipulating the variables, meaning, it is an exercise in which independent variables are not intentionally modified to see their effect on others (Hernandez, Fernandez & Baptista, 2014). This design intends to observe a phenomenon as it occurs in its natural context in order to analyze it.

Participants

The study was conducted in a sample of students ($n=40$), group 901 of the morning session at Colegio Cundinamarca IED, in locality 19 of Ciudad Bolívar in Bogotá. Participants were in the mid-low socio-economic level. Data collection took place in the last week of October 2020.

The sample was made up by cases that were accessible as a teacher of the institution (Battaglia, 2008). This advantage was due to the fact that time and means of data collection were limited by the imminent end of the institution's academic term. Participants were informed of the questionnaire's objective and were encouraged to participate voluntarily. Students did not receive academic incentives in exchange for their participation and were given extracurricular time and space to answer the instrument. Participants could only answer the twenty questions once.

The sample's age ranged from 13 to 17 years ($M=14.95$; $SD=1.02347$). The sample's distribution is shown in Table 1.

| Group | Participants | |
|---------|---------------|------------------|
| 901J.M. | <i>Gender</i> | <i>Frequency</i> |
| | Male | 19 |
| | Female | 21 |
| | <i>Total</i> | <i>40</i> |
| | <i>Age</i> | <i>Frequency</i> |
| | 13 | 1 |
| | 14 | 15 |
| | 15 | 13 |
| | 16 | 7 |
| | 17 | 4 |
| | <i>Total</i> | <i>40</i> |

Table 1
Distribution of the Sample

Instrument

The instrument implemented was the *Self-Regulatory Messages Questionnaire* (SRMQ), developed by Alonso-Tapia and Panadero (2010). The questionnaire consisted of twenty items of 34 (originally in English with the acronym SRMQ) and it assessed students' messages of self-regulation to themselves while attempting their learning goals. The coherence or consistency measure of the *Self-Regulatory Messages Questionnaire* was of α 0.7931.

The instrument grouped five factors of self-regulation for learning: negative emotions (4 items) α 0.718, motivation (5 items) α 0.761, avoidance (2 items) α 0.361, performance (6 items) α 0.644 and process (2 items) α 0.641, answers were given in a 5-point Likert scale. Item 11 of the instrument was not evaluated since it is being validated by Alonso-Tapia and Panadero (2010).

Data Analysis

Data compilation took place using Google Forms, which was available online for a week. Data were extracted to an Excel worksheet that was imported to the SPSS software, offered by IBM for statistical analysis. The study of the database resulted in descriptive statistical indicators, and correlation coefficients were calculated to determine the association between the five factors of self-regulation for learning (negative emotions, motivation, avoidance, performance and process).

Results

The instrument proposed by Alonso-Tapia and Panadero (2010) was applied to a sample of forty participants. Its mean was of 2.753 with values ranging between 1.800 at the least and 3.473 at the most. The range of variance of the element and covariances between elements was of 0.83 and 1.459, respectively. Finally, the range of correlations between

the instrument's elements (items or reactivos) was of 1.064 with a total variance of 0.057.

| | Mean | Minimum | Maximum | Range | Maximum / Minimum | Variance | No. of elements |
|-------------------------------|-------|---------|---------|-------|-------------------|----------|-----------------|
| Mean of the element | 2.753 | 1.800 | 3.475 | 1.675 | 1.931 | .244 | 20 |
| Variances of the element | 1.341 | 1.015 | 1.846 | .831 | 1.818 | .051 | 20 |
| Covariables between elements | .216 | -.487 | .972 | 1.459 | -1.995 | .101 | 20 |
| Correlations between elements | .160 | -.384 | .679 | 1.064 | -1.767 | .057 | 20 |

Table 2
Summary Statistics of the Elements (Instrument's Items or Reactives)

Total statistics of the instrument's items or elements reveal that if element 9 "*Stay calm... slowly but surely I will accomplish it*" were to be eliminated, Cronbach's alpha would get closer to 0.8 with a value of 0.7999. Instead, if element 2 "*I'm exhausted! But I must press on if I want to pass*" were to be eliminated, Cronbach's alpha would get near 0.03. these projections are useful to verify the instrument's internal feasibility. Especially because they indicate that for the sample, reactivos 9 and 2 should be carefully evaluated to determine its accuracy (with the help of various coefficients) when measuring self-regulation for learning.

In case of the self-regulation factors for learning, results obtained for internal coherence or consistency for each were as follows: negative emotions α 0.718, motivation α 0.761, avoidance α 0.361, performance α 0.644 and process α 0.641. Figures of descriptive statistical analysis for the five factors show the following particularities: motivation had the maximum value of the mean with 3.2100, while avoidance had the minimum value with 1.9375. The range of the mean between the factors was of 1.2725.

In the case of the standard deviation, the factor of *process control* has the data with the highest dispersion in terms of the mean. The average of said deviation equals 1.0389 and it is the highest figure between the different values of deviation presented.

| | Emotions | Motivation | Avoidance | Performance | Process |
|--------------------|----------|------------|-----------|-------------|---------|
| Mean | 2.1938 | 3.2100 | 1.9375 | 3.0167 | 2.8500 |
| Standard Deviation | .83683 | .86166 | .82577 | .70083 | 1.03898 |
| Minimum | 1.00 | 1.60 | 1.00 | 1.33 | 1.00 |
| Maximum | 4.00 | 4.80 | 4.50 | 4.17 | 5.00 |

Table 3
Statistics of the Self-Regulation Factors Suggested by Alonso-Tapia and Panadero (2010)

Standard deviation figures of factors such as emotions, motivation and avoidance are very similar. Dispersion values are at 0.83683, 0.86166 and 0.82577, respectively. Finally, the lowest standard deviation corresponds to the *performance control* factor, with 0.70083, and with a difference of 0.33815 with the highest figure.

Pearson correlation coefficients between factors are shown in Table 4. Four of the correlations had a negative coefficient (.). In the first case,

factors or variables of motivation and emotions obtained $r = -0.177$. In the second case, the process and emotions control had a coefficient above -0.032 . In the third case, correlation between avoidance and motivation control was of $r = -0.053$; finally, in the last case, process and avoidance control have a correlation of -0.131 .

Table 4 show the most significant correlations between factors or variables are two-tailed and it was significant in the 0.01 level 4. In the first case, variables of avoidance and emotion had a correlation of 0.644. In the second case, variables of performance and emotions had a coefficient of 0.596, 0.048 more than in the first case. In the third case, Pearson correlation coefficient is also positive and is seen in the existing relationship between control of the process and control of motivation, with a value of $r = 0.580$. Finally, a positive relationship is evinced between performance and avoidance, with $r = 0.438$. Regarding statistics related to gender in Table 5, the lowest mean is in the women and their relationship with avoidance, with a value of 1.6667. For men, this variable is of 2.2368, a difference exceeding 0.5. Pertaining to performance, the situation is slightly inverted, the mean for men is of 2.9912, women have a mean 0.0485 higher than men's.

Table 4
Correlations Between Factors

| | | Emotions | Motivation | Avoidance | Performance | Process |
|-------------|---------------------|----------|------------|-----------|-------------|---------|
| Emotions | Pearson correlation | 1 | | | | |
| Motivation | Pearson correlation | -.177 | 1 | | | |
| Avoidance | Pearson correlation | .644** | -.053 | 1 | | |
| Performance | Pearson correlation | .596** | .270 | .438** | 1 | |
| Process | Pearson correlation | -.032 | .580** | -.131 | .244 | 1 |

Table 4
Correlations Between Factors

| | Gender | Mean | Standard Deviation | Standard Error Mean |
|-------------|--------|--------|--------------------|---------------------|
| Motivation | Female | 3.2476 | .82923 | .18095 |
| | Male | 3.1684 | .91715 | .21041 |
| Emotions | Female | 2.0595 | .77824 | .16983 |
| | Male | 2.3421 | .89447 | .20521 |
| Avoidance | Female | 1.6667 | .55528 | .12117 |
| | Male | 2.2368 | .97708 | .22416 |
| Performance | Female | 3.0397 | .52943 | .11553 |
| | Male | 2.9912 | .86687 | .19887 |
| Process | Female | 2.9762 | 1.11216 | .24269 |
| | Male | 2.7105 | .96200 | .22070 |

Table 5
Statistics of Factors Related to Participants' Gender

Finally, figures in Table 5 illustrate that means behave considerably similar. Unlike the figures of means, with standard deviation values, it is revealed that for each factor of self-regulation for learning, data dispersion per gender behaves differently. For instance, women's standard deviation in the factor focusing on process is the highest of the measurement at

1.11216. For the same factor, the difference with men's deviation is of 0.15016.

The minimum value of the standard deviation is also present in the female group. It is seen that the performance factor or variable is of 0.52943, and its difference with the male group is of 0.33744. Finally, it can be concluded that, except for the factor of *process*, in every case, standard deviation values for women in the other factors are smaller than for men.

Results also evince a significant correlation between emotion and avoidance. To a certain extent, this could indicate that participants with insufficient self-regulation of their emotions experience mostly messages that focus on avoidance. In that regard, the study by Boekaerts and Corno (2005) has exhibited that the use of strategies focusing on avoidance are useful to reduce stress and anxiety deriving from tasks or activities for which the required capacities are considered to be lacking (Russell, Baik, Ryan, & Molloy, 2020). Also, Bandura (1991) and Panadero (2011) have suggested that activities which usually generate negative effects on individuals often end in avoidance. For example, if a student believes he "failed" in the execution and development of a task or activity, he will possibly feel that regardless of the effort, his success expectations will be very limited.

In that sense, avoidance can be extremely negative for learning. In particular, when "negative thoughts make students block and forget the accomplishment of the goal" (Panadero, 2011, p.23). It could be said that avoidance is a consequence of precarious control of motivation for a task or activity. Nevertheless, this correlation was not visible within the sample, thus, there are not enough data to establish that analysis of factors or variables.

On the other hand, data suggest a correlation between control of motivation and process, although it is not significant, it leads to the assumption that the main source of motivation for self-regulation has to do with the perception of self-efficacy. This is related to an individual's perception of competence when he/she feels fit for something, which given the case, could affect his/her intrinsic motivation over a task (Paris & Paris, 2001; Zimmerman, Bonner & Kovach, 1996). In these terms, the studied sample revealed that control of motivation affects the efficacy of the learning process. This means that a motivated student plans, executes and evaluates different strategies that constitute the learning process, with the aim of fulfilling the goals established in the beginning.

Overall, it can be concluded that the instrument used to measure the messages of self-regulation for learning helped evince existing correlations between avoidance, emotion, performance and control of the learning process. However, the small number of participants and the fact that the study was undertaken in a single institution, are both factors with implications for external validity. Another factor is that only one ninth grade group at the institution (single session) took part of the study, which means that the results cannot be generalized for the institution.

In that regard, the non-experimental study conducted at Colegio Cundinamarca IED may become an initial approach to delve into which opinions and attitudes arise as self-messages in students' minds as they develop a task or activity. This could be of significant help to outline key characteristics of self-regulation processes for learning that are currently implemented by the institution's ninth grade students.

Finally, it must be highlighted that the studied sample's most important correlations had to do with emotions. This could suggest that control of emotions is consistently associated with the use of strategies of avoidance and performance. Further studies are expected to delve into the most significant correlations that this type of factors may have in improving self-regulation.

DISCUSSION AND CONCLUSION

Based on the results found, firstly, it can be affirmed that the measure of internal coherence or consistency of the *Self-Regulatory Messages Questionnaire* (SRMQ) for the studied sample, is within the range of acceptable to good, considering that the α coefficient exceeds 0.7. This means that the instrument's items are interrelated and measure construct which is the subject of inquiry.

Secondly, the most significant correlations between analysis factors or variables initially reveal how self-regulation focused on performance varies according to the index of negative emotions expressed by the participant in certain task or activity (Rincon-Baez, 2019; Rosário et al., 2014; Zheng et al., 2021). This leads to the fact that emotional self-regulation is associated with high failure indicators in tasks and activities. In that regard, studies such as that by Rivers, Brackett, Katulak and Salovey (2006), and by Winne and Hadwin (1998), have proven how effective regulation of emotions, particularly of those associated with negativity in completing an activity, is associated with improved performance indicators. In other words, an individual with the capacity to effectively regulate the emotional experience will be more likely to attain the established goal, since regulating negativity facilitates the perceived improvement of goals (Kuhl, 1984; Weiner, 1986).

In that sense, it can be proposed that the lack of emotional regulation affects academic performance, while diminishing attention processes, information processing and increasing anxiety (Andrade & Du, 2005; Benbunutti, 2002). Some of the effects of scarce emotional self-regulation are related with systematic deterioration of cognitive processes needed by an individual to learn and adequately perform in a task or activity (Condor-Herrera, 2020). On this particular issue, Weiser and Riggio (2010) and Zimmerman (2000) have revealed the recurring belief that academic inefficacy is reinforced in the lack of self-regulation of negative emotions. This, of course, endangers the harmonious development of cognition, decreasing performance or preventing the accomplishment.

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