



DISTANCE EDUCATION: AN ANALYSIS OF LEARNING STRATEGIES IN HEALTH EDUCATION

EDUCAÇÃO A DISTÂNCIA: UMA ANÁLISE DAS ESTRATÉGIAS DE APRENDIZAGEM NA FORMAÇÃO EM SAÚDE

EDUCACIÓN A DISTANCIA: UN ANÁLISIS DE LAS ESTRATEGIAS DE APRENDIZAJE EN LA FORMACIÓN EN SALUD

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RESUMO

Objetivo: investigar o uso das estratégias de aprendizagem utilizadas pelos discentes de um curso de especialização ofertado na modalidade a distância. **Método:** a pesquisa está embasada na Psicologia Cognitiva e na Teoria do Processamento da Informação. Para a coleta dos dados, foi utilizado o instrumento padronizado intitulado Escala de Estratégias de Aprendizagem (EEA). **Resultados:** os dados foram analisados quantitativamente mediante procedimentos estatísticos de análise descritiva. Os resultados apontam que os sujeitos fazem uso, com maior frequência, das estratégias cognitivas (média=8,2; dp=1,4), seguidas, respectivamente, das comportamentais (média= 7,9; dp=1,4) e das autorregulatórias (média=7,4; dp=1,4). **Conclusão:** ressalta-se a importância da temática e da necessidade de outras pesquisas que associem o tema ao papel do tutor como incentivador no desenvolvimento das estratégias de aprendizagem no contexto da e-Learning.

Palavras-chave: Educação a Distância; Psicologia Cognitiva; Estratégias de Aprendizagem.

ABSTRACT

Objective: investigate the use of learning strategies used by students of a specialization course offered in the distance learning mode. **Method:** the research is based on Cognitive Psychology and Information Processing Theory. In order to collect the data, the standardized instrument called Learning Strategies Scale (LSS) was used. **Results:** the data was analyzed quantitatively using statistical procedures of descriptive analysis. The results show that subjects use cognitive strategies (average = 8.2, dp = 1.4), followed by behavioral ones (average = 7.9, dp = 1.4) and of self-regulation (average = 7.4, dp = 1.4). **Conclusion:** the importance of the theme is emphasized and the need for other research that associates the theme with the role of the tutor as an incentive in the development of learning strategies in the context of e-Learning.

Keywords: Distance Education, Cognitive Psychology, Learning Strategies.

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RESUMEN

Objetivo: investigar el uso de estrategias de aprendizaje utilizadas por los estudiantes en un curso de especialización que se ofrece en la distancia. **Método:** la investigación está fundamentada en la Psicología Cognitiva y en la Teoría del Procesamiento de la Información. Para la recogida de datos, se utilizó el instrumento estandarizado titulado "Escala de Estrategias de Aprendizaje (EEA)". **Resultados:** los datos fueron analizados cuantitativamente mediante procedimientos estadísticos de análisis descriptivo. Los resultados apuntan que los sujetos hacen uso con mayor frecuencia de las estrategias cognitivas (promedio = 8,2, dp = 1,4), seguido, respectivamente, de las conductas (promedio = 7,9, dp = 1,4) y de las autorregulatorias (promedio = 7,4; dp = 1,4). **Conclusión:** Se resalta la importancia de la temática y de la necesidad de otras investigaciones que asocien el tema al papel del tutor como incentivo en el desarrollo de las estrategias de aprendizaje en el contexto de la e-Learning.

Palabras-clave: Educación a Distancia; Psicología Cognitiva, Estrategias de Aprendizaje.

INTRODUCTION

In the Brazilian context, Distance Education - Distance Education has been gradually disseminated and used in different spaces and for different publics. The new alternatives for the promotion of education that emerge in this context broaden the methodological and organizational possibilities and provide diverse environments for didactic, qualification and training purposes.¹

In this way, EaD becomes part of strategies for staff development in various segments, presenting itself as an alternative to overcome geographical barriers, financial and temporal resources, as well as promote social inclusion.

In this scenario, it becomes increasingly important to prioritize for the quality and effectiveness of educational actions, identifying factors that may interfere with the intended results. One of the factors that facilitate and influence the cognitive teaching-learning process is the use of the learning strategies used by the students when participating in the courses. These strategies are an important tool for achieving the educational goals.²

It is noteworthy that studies on human cognition have been evolving rapidly, especially after the emergence of computer and computational modeling. In this context, Cognitive Science presents itself as an area with an interdisciplinary characteristic, since it is interrelated with Cognitive Psychology, Computer Science, Information Systems, Artificial Intelligence, Neuroscience and Linguistics and that have been trying to understand the way people think, interpret and perceive the world.³

It is in this sense that psychology is concerned with understanding how these individual differences can interact with instruction and with contexts to achieve positive outcomes in the learning provided with professional qualification.

Each individual's way of being and perceiving the world is directly linked to the mental models established throughout their life history, translating into images, abstractions, presuppositions, feelings and histories that establish mental strategies that go being built and developed.⁴

That constructed mental models determine how the individual sees, interacts, feels, and relates to the world.⁵ However, mental models are not static, and may be improved for better adaptation and can eliminate distorted mental models.

Cognitive theory has changed the conception of the teaching-learning process, by understanding learning as an active process that takes place internally in the learner and can be influenced by it, eliminating the student's vision as a passive subject in the knowledge process.⁶

The construction of the knowledge presupposes individual actions, on the part of the apprentice, towards the goals set, adopting a logic of use appropriate to the context in which the individual is inserted.⁷ This is called learning strategies and their assumptions are based on the information processing model.

The theory of information processing brings together several approaches that study mind and intelligence in terms of mental representations and their processes underlying observable behavior.⁷

Information processing psychologists study human intellectual abilities, analyzing the way people solve mental tasks to construct artificial models which aim to understand the processes, strategies and mental representations used by people in performing these tasks.^{8:41}

In short, the information processing theory compares the activities of the human mind to the processing of a computer and serves as a structural basis for learning strategies. Understanding them, therefore, corroborates the learning process. In this sense, it is understood that strategies are procedures used by the individual seeking to ensure success in all stages of the learning process.

They are procedures focused only on learning activities. Strategies can be modified by training in order to increase the effectiveness of learning in a specific activity or environment. This means that there are no better or worse strategies, but strategies more or less appropriate to the type of activity to be learned.^{2:180}

Thus, understanding how students make use of learning strategies in the construction of their knowledge can be important in the improvement of the instructional planning of distance courses, because it allows to analyze for which people are more appropriate certain instructional procedures.²

The significance of associating different learning strategies, developed a classification system of strategies, comprising different levels of analysis, formed by three categories: cognitive learning (primary) - organization and elaboration actions; behavioral (primary) strategies - seeking interpersonal help, seeking help in written material and practical application, and self-regulatory strategies - controlling emotion, controlling motivation, and monitoring comprehension.²

The authors also point out that activities of different natures and degrees of complexity require the use of different learning strategies. Therefore, individuals in the workplace are likely to use different strategies of students in academic settings to achieve successful learning.⁹

In this study, it is proposed, as objective, the analysis of the learning strategies used by the students in the Lato sensu specialization course in Micropolitics of Management and Health Work offered in the distance modality for the State of Alagoas / Brazil. The following objectives were proposed: a) to analyze the frequency of cognitive, behavioral and self-regulatory learning strategies and b) to compare the frequency of use of learning strategies related to emotion control, interpersonal help, repetition and organization, the control of motivation, the elaboration, the search for help in the didactic material and the monitoring of the understanding.

Thus, the research seeks to respond to the problem: "To what extent are cognitive, self-regulatory and behavioral learning strategies used by students in the updating and specialization course in Distance Education?"

It will be adopted, as hypothesis, considering the profile of the health professional, to whom the studied course is destined, that the students use, more frequently, of the cognitive learning strategies to the detriment of the others.

METHOD

This scientific research is classified, as to type, in a case study. Regarding the approach, it is classified in quantitative terms, intending to reach the

proposed objectives as a result of the instrument of data collection already parameterized in the analysis.

It should be pointed out that the data to be presented are part of a larger research work, developed under the Masters in e-Learning Systems Management at the Nova de Lisboa University, and this article addresses the objectives outlined in the research work that generated it.

The research was developed at the State Department of Health, where the *Lato sensu* postgraduate course of Micro-politics of Management and Work in Health was offered, in the form of distance education, with some face-to-face meetings. A total of 112 vacancies were offered and, from these, 102 students were selected and enrolled, a universe from which the survey subjects were screened.

From this research, the students approved in the course under study, between 2014 and 2015 participated, being this universe composed of 37 successful students. Of these, 36 (97%) are female and one (3%), male, with a total of 35 students. The participants are students-workers who are members of the Unified Health System (UHS).

As a data collection tool, the research made use of the questionnaire developed and validated by the researchers Thaís Zerbini and Gardênia Abbad in 2008 entitled Learning Strategies Scale (LSS). It is noteworthy that the instrument was guided by the theoretical assumptions of Warr and Allan in 1998, since they considered the study of learning in the work environment.

The LSS questionnaire is associated with an 11-point Likert* scale with response options from zero (never) to ten (always) and is composed of 28 items, divided into seven factors.

For a better understanding of these factors and their relation with the learning strategies, the table below follows.

FACTORS	DEFINITION	INSTRUMENT ITEMS	RELEVANT TO THE STRATEGY
1. Emotion control	Control of anxiety and prevention of concentration dispersions caused by feelings of anxiety.	1 to 5 ($\alpha=0.89$)	Self-regulatory

* Likert scale is composed of a set of sentences (items) in relation to each one of which the subject being evaluated is asked to express the degree of agreement from totally disagree (level 1) to totally agree (levels 5, 7 or 11).

2. Search for interpersonal help	Obtaining help from other people, such as peers and teachers, to ask questions about course content.	from 6 to 11 ($\alpha=0.89$)	Behavioral
3. Repetition and organization	Repetition consists in the mental repetition of the information in the form in which it was presented to the student. Organization refers to the identification of central ideas of the material and creation of mental schemas that group and relate elements that have been learned.	from 12 to 16 ($\alpha=0.77$)	Cognitive
4. Motivation control	Control of motivation and attention by the student in order to analyze and refer to possible implications and connections between the material learned and the existing knowledge and experience.	from 17 to 20 ($\alpha=0.84$)	Self-regulatory
5. Elaboration	Procedures adopted by the student in order to analyze and reflect on the possible implications and connections between the material learned and the existing knowledge and experiences.	from 21 to 23 ($\alpha=0.83$)	Cognitive
6. Search for help in teaching materials	It is the search for information in written documents, instruction manuals, computer programs and other sources that do not involve social contact.	From 24 to 25 ($\alpha=0.75$)	Behavioral
7. Monitoring comprehension	Process of acquisition of learning and modification of the study behavior of the individual, when necessary.	from 26 to 28 ($\alpha=0.82$)	Self-regulatory

Figure 1. Definition of the factors of the instrument in relation to the relevance to strategies. Source: Adapted by the author.²

For the data collection, the online questionnaire (Google Drive creation and sending tool) was used. A total of 37 were sent to the electronic addresses of all those approved, the Free and Informed Consent Term (FICT) and the link to access the questionnaire. Data collection was completed in February 2017 with a total of 35 respondents.

The database was exported to Excel and in this worksheet we included factor variables by means of the points obtained in the corresponding questions.

Other strategies were added by factor means constructed in the previous step: **Self-Regulatory Strategies**, by means of factors 1, 4 and 5; **Cognitive strategies**, by means of factors 3 and 5 and, finally, the **Behavioral strategies**, by means of factors 2 and 6. The descriptive data were presented by means of absolute and relative values, confidence interval, means and standard deviation.

In the statistical analysis, we chose to use the Friedman test, performed by SPSS (version 21), to test all factors and strategies in isolation. In the comparison between factors, the Wilcoxon Signal-Related Test of Related Samples, chosen automatically by SPSS (version 21.0), was used. The accepted level of significance was 0.05.

In the analysis of the answers collected through the LSS instrument, the criteria already defined by the authors of the instrument will be used, which presented the following parameters: low use = average values between zero and four; moderate use = values between four, one and seven; frequent use = values between seven, one and ten.

RESULTS

Regarding the analysis of cognitive, behavioral and self-regulatory learning strategies, taking into account the data collection instrument used, it is shown that each learning strategy is composed of an interlacing of factors previously presented in table 1.

It can be seen that the three classifications of strategies presented different means, as well as the corresponding factors, according to the answers attributed by the students, presented in table 1 below.

Table 1. Presentation Of Averages - Self-Regulatory, Cognitive And Behavioral Learning Strategies.

Learning strategy	n	Average	sd	Factors	Average
Self-Regulatory Strategy	35	7.4	1.4	1 Emotion control	7.6
				4 Motivation control	7.9
				7 Comprehension Monitoring	6.9
Cognitive Strategy	35	8.2	1.4	3 Repetition and organization	7.5
					8.9

Behavioral Strategy	35	7.9	1.4	5 Elaboration 2 Search for interpersonal help 6 Search for help in teaching materials	7.8 8.0
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Key-sd = standard deviation

Observing the data presented in table 1, the self-regulatory strategies presented the lowest average (average = 7.4, sd = 1.4), followed by the behavioral strategy (average = 7.9, sd = 1.4) (average = 8.2; sd = 1.4), which has the highest average.

The self-regulating strategies, found in this study as frequently used by apprentices, refer to the individual's motivation to learn and self-management of their efforts in the learning process, including their emotional control.²

Students submitted to virtual learning environments develop the need to manage and control their efforts in the face of learning tasks, as they are confronted with emotional, motivational, cognitive and collaborative challenges.¹⁰ The author also adds that these new learning contexts can have considerable effects on the strategies of regulation adopted by the apprentice to the point that new strategies emerge.¹⁰

The second objective is to analyze the use of cognitive abilities, behavioral skills and anxiety control, motivation and monitoring of the comprehension that compose the LSS, used by the students to control their own psychological process, it is known that the LSS is composed of seven factors and corresponding affirmations.

Table 2 shows the average, standard deviation, minimum and maximum values for each statement that compose the LSS instrument, seeking to facilitate the reading of the final data.

Table 2. Average And Standard Deviation Of The Factors That Make Up The LSS By Affirmation Items.

Factors	Affirmatives	Average	SD	Min	max
Emotion Control	1 I kept calm in the face of the possibility that things would be difficult	7.51	1.65	3	10

	2	I repeated to myself that everything would go well at the end of the course	8.60	1.19	5	10
	3	I kept calm about the possibility of having an income in the course below the expected	7.34	1.89	2	10
	4	I kept calm about the possibility of making mistakes when carrying out the course activities	7.43	1.74	4	10
	5	I kept calm about the possibility of things going wrong	6.89	2.14	0	10
Search for interpersonal help	6	I expressed my ideas in chats	7.40	2.05	2	10
	7	Expressed my thoughts on the mailing list	8.06	1.37	5	10
	8	I exchanged emails with my colleagues, participating in the learning community	6.91	2.80	0	10
	9	I exchanged information with colleagues about content	7.83	2.06	5	10
	10	I exchanged information with tutors on course content	8.17	1.40	5	10
	11	I sought help from the tutor to clarify my doubts about the content	8.14	1.56	5	10

Repetition and organization	12	I took notes on course content	8.37	1.90	0	10
	13	I mentally repeated the content of the course	7.37	2.22	0	10
	14	I drew schematics to study the course content	6.51	3.13	0	10
	15	I made summaries of course content	6.83	2.74	0	10
	16	I have read the course content in the printed material	8.23	2.26	0	10
Motivation control	17	I forced myself to pay attention when I felt tired	8.20	1.64	4	10
	18	I struggled harder when I realized I was losing focus	7.74	2.20	1	10
	19	I increased my efforts when it did not interest me	7.89	1.75	2	10
	20	I struggled harder when I realized I was losing interest	7.69	1.73	2	10
Elaboration	21	I linked the contents of the course to my previous knowledge	8.83	1.22	6	10
	22	I linked the course content to my previous experiences	8.94	1.11	6	10
	23	I have identified, in my daily life, situations to apply the content of the course	8.97	1.15	6	10

Search for help with teaching materials	24 I searched for other sites related to course content	8.20	1.59	4	10
	25 I searched for other sources of research, outside the internet, related to the course	7.80	2.03	2	10
Comprehension Monitoring	26 I asked questions to test my understanding of course content	7.06	2.31	0	10
	27 I reviewed the story to see how much I mastered the content	7.34	2.35	0	10
	28 I elaborated questions, tests and tests to stimulate my learning	6.43	2.86	0	10

Key: SD = Standard deviation / Min.= minimum value / Max.= maximum value.

In relation to factor 1 - **Emotion control**, in the individual analysis of the statements, the following was obtained: the affirmative of number 2 - **I repeated to myself that everything would go well at the end of the course** (average = 8.6; SD = 1.9) showed frequent use in the research; the sentence 6 - **I kept calm about the possibility of things going wrong.** (average = 6.89; SD = 2.14) appeared as the lowest average and was classified as moderate use because it presented a average below seven; the sentences of number 1 - **I kept calm in the face of the possibility that things would be difficult** (average = 7.51; sd = 1.65), 3 - **I kept calm about the possibility of having an income in the course below the expected** (average = 7.34; sd = 1.89) and 4 - **I kept calm about the possibility of making mistakes when carrying out the course activities** (average = 7.43; sd = 1.74) were frequently used, although they presented a average very close to the limit for moderate use.

As for factor 2 - **Search for interpersonal help**, the affirmative 10 - **I exchanged information with tutors on course content** (average = 8.17; SD = 1.40) indicated frequent use and appeared as the strategy most used by

students in this factor. The affirmative 8 - **I exchanged emails with my colleagues, participating in the learning community** (average = 6.91; SD = 2.8) suggested a moderate use of this strategy by students. Claims 6, 7, 9 and 11 indicated frequent use, but with an average lower than that of affirmative 10.

In factor 3 - **Repetition and organization**, affirmative 12 - **I took notes on course content** (average = 8.37; SD = 1.90) indicated frequent use and presented the highest average in this factor. The sentences 14 - **I drew schematics to study the course content** (average = 6.51, sd = 3.13) and 15 - **I made summaries of course content** (average = 6.83; SD = 2.74) indicated moderate use of these strategies by students.

In factor 4 - **Motivation control**, the data indicated that the students made frequent use of all strategies listed, presenting a higher average in sentence 17 - **I forced myself to pay attention when I felt tired** (average= 8,20; sd=1,64).

In factor 5 - **Elaboration**, the sentences indicated moderate use of these strategies by the students, except the affirmative 23 - **I have identified, in my daily life, situations to apply the content of the courses** (average = 8.97; SD = 1.15), which appeared as the most used strategy of the whole LSS by the students.

Factor 6 - **Search for help with teaching materials** presented as the second-highest use by students.

Finally, factor 7 - **Monitoring comprehension** had, in strategies 26 - **I asked questions to test my understanding of the contents of the course** (average = 7.06; sd = 2.31) and 27 - **I reviewed the story to see how much I mastered the content** (average = 7.34; sd = 2.35), frequent use by students. Already sentence 28 - **I elaborated questions, tests and tests to stimulate my learning** (average = 6.43; sd = 2.86) presented moderate use by the research subjects.

Table 3. Averages Of The Factors Of The LSS. N=35

Factors	Average	sd
1 Emotion control	7.55	1.42
2 Search for interpersonal help	7.75	1.32
3 Repetition and Organization	7.46	2.07
4 Motivation Control	7.88	1.57
5 Elaboration	8.91	1.09
6 Search for help in teaching materials	8.0	1.72

Key: sd=standard deviation

Considering the data presented in table 3, it can be seen that the means ranged from 6.94 to 8.91, which makes it possible to affirm that the students of this case study denoted behaving moderately in some factors and frequently in others.

Figure 2 seeks to present, in a hierarchical way, the classification, in order of average of the factors, from the lowest to the highest average, based on the values presented in table 3.

Lowest average ←						→ Highest average	
Factor 7	Factor 3	Factor 1	Factor 2	Factor 4	Factor 6	Factor 5	

Figure 2. Presentation of LSS factors by order of average -.

The data showed that Factor 7 - **comprehension monitoring** (mean = 6.94 sd = 2.30), that is, the process of learning acquisition and behavior modification, presented the lowest mean, indicating a moderate use of these behaviors by the students. However, the standard deviation in this factor was higher than in the other factors.

Factor 3 (mean = 7.46 sd = 2.07) and factor 1 (mean = 7.55 dp = 1.42) were among the three lowest averages in the study, however, even though they were among the means the value presented indicated that the behaviors used by the students were frequent in these factors because their average exceeds the value of 7.00, based on the classification defined in the LSS.

The averages attributed to factors 5 (mean = 8.91 sd = 1.09), which refers to the elaboration, and 6 (mean = 8.00 sd = 1.72), which refers to the search for help in didactic material, were among the highest in comparison with the others, with factor 5 being the most used by students in the study. However, this factor had the lowest standard deviation. Previous studies found similar results, that is, in the research, this factor appeared in the same order of classification and indicated frequent use.¹¹

In order to analyze whether the means of each factor that compose the LSS have a significant difference or not, the data were submitted to the Wilcoxon Signal-Related Test of Related Samples, which verified that the differences in means obtained in the factors are statistically significant.

Table 4. Comparison Between LSS Factors.

1 Emotion control	2 Search for interpersonal health	3 Repetition and organization	4 Motivation control	5 Elaboration	6 Search for help in teaching materials	7 Monitoring
2 0.448	1 0.448	1 0.900	1 0.180	1 *0.000	1 0.155	1 0.195
3 0.900	3 0.503	2 0.503	2 0.852	2 *0.000	2 0.325	2 *0.024
4 0.180	4 0.852	4 0.276	3 0.276	3 *0.000	3 0.118	3 *0.042
5 *0.000	5 *0.000	5 *0.000	5 *0.000	4 *0.000	4 0.530	4*0.006
6 0.155	6 0.325	6 0.118	6 0.530	6 *0.001	5 *0.001	5 *0.000
7 0.195	7 *0.024	7 *0.042	7 *0.006	7*0.000	7 *0.001	6 -0.001

Note: * significant p

The analysis of the use presented in table 4 indicated that **factor 1** differed significantly from factor 5, being its use with a mean of 8.91; that **factor 2** differed significantly from factors 5 and 7, with its use with a mean of 7.75; that **factor 3** differed significantly from factors 5 and 7, and its use with a mean of 7.46; that **factor 4** differed significantly from factors 5 and 7, being the use with a mean of 7.88; that **factor 5** differed significantly from all other factors, and this was the one with the highest use, with an average of 8.91; that **factor 6** differed significantly from factors 5 and 7, being used with a mean of 8.00, and finally, **factor 7** differed significantly from factors 2, 3, 4, 5 and 6, which was the one with the lowest use , with a mean of 6.94.

CONCLUSION

It is recognized the importance of studies about Distance Education, more specifically about the process of teaching and learning, understanding the learner as the subject of this process. In this context, strategies emerge as one of the decisive elements for optimizing the learning processes of individuals.

Learning to learn is the most ambitious and at the same time irrevocable goal of education, it is equivalent to being able to carry out meaningful learning by itself in a wide range of situations and circumstances.^{12:8}

In this context, this work was carried out with the general objective of analyzing the frequency of the use of the learning strategies used by the students in the refresher courses and specialization in Micro-politics of Management and Work in Health offered in the distance modality for the State of Alagoas-BR.

Among the objectives outlined in the research, there is a comparison of the use of learning strategies related to the factors that make up the LSS. The analysis indicated that the students behaved moderately in some factors and frequently in others, demonstrated that they know the strategies studied.

Factor 7 – **comprehension monitoring**, which is related to a self-regulatory strategy, presented the lowest mean, indicating a moderate use of these behaviors. From this, it can be inferred that the majority of students use, unsatisfactorily, the mechanisms of control and regulation of learning. This situation could be modified if participants were taught to use self-regulatory learning strategies more frequently, as the strategies of learning can be learned naturally or by training in order to increase the effectiveness of learning in order to facilitate the achievement of the learning criteria.⁶

Factor 5, which refers to the procedures adopted by the student in order to analyze and reflect on possible implications and connections between the material learned and the existing knowledge and experiences, indicated the greater use by students of the study, and this factor corresponds to cognitive strategies.¹¹

In summary, the hypothesis raised at the time of the construction of the research, related to the use of learning strategies used by the students of the course, is confirmed by the statistical analysis, using the Friedman’s test, in which there was a statistically significant difference ($p = 0.002$) in relation to the use of Self-Regulatory, Behavioral and Cognitive Strategies, showed that the cognitive strategies were used more frequently by the students in comparison with the others.

Table 5. Analysis Of Significance - Friedman Test.

VARIABLES	FRIEDMAN’S TEST p
Factor 1, Factor 2, Factor 3, Factor 4, Factor 5, Factor 6 and Factor 7	0.000
Self-Regulatory Strategies, Cognitive Strategies, and Behavioral Strategies.	0.002

Behavioral strategies were the second in use, followed by self-regulation, which had the lowest incidence. However, although these strategies have been used less frequently by the participants of this research, they are of paramount importance for the teaching-learning process, since they are essential in the construction of knowledge by the student, especially in the courses in e-learning

, which require students to have greater emotional, motivational, and monitoring of understanding to persist in the course, rather than in face-to-face courses.²

The finding of this study was similar which made it possible to infer that metacognitive strategies have probably not been taught during the schooling process, so that students do not know how to use them satisfactorily and do not know the benefits of its use for efficient learning.¹¹

The data found in this research also inquire about the pedagogical strategies adopted in this course, if they led the students to the appropriate use of learning strategies, especially the self-regulating strategies of emotion control, which occupy a prominent role in a course in e-learning modality, as well as the role assumed by the tutors in the learning process, since the absence of a consistent pedagogical strategy can also lead to unsuccessful teaching.

The limitations of this study are recognized, in particular, by the ex-post-facto characteristic of the research, since the data studied were collected after the occurrence of the event, limiting the study to what was reported by the subjects regarding related and experienced feelings and attitudes during the course of the course studied. Therefore, they may present a bias towards expectations of responses to be recorded by participants.

The importance of this subject and the need for research that addresses the role of the tutor as an incentive in the development of learning strategies by the students in the context of distance education is highlighted, since research shows that teaching the learner to learn is possible, and computer-based instructional environments are useful for teaching.¹³

Finally, it is expected that this study will contribute to the field of Education and Distance Education, helping in the understanding of the individual learning processes and in the improvement of the planning and instructional design.

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