



CRITICAL SUCCESS FACTORS THAT IMPROVE SCHOOL MANAGEMENT

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ABSTRACT

Highlights: Educational institutions increasingly need to deal with the responsibility of transmitting knowledge by promoting student development and qualifying them for the job market. To remain competitive in this market they need to satisfy the needs of their clients (parents and students). Therefore, educational managers must use strategies to improve and develop the organizational environment of the school.

Objective: Analyse, through identification, description and evaluation, the Critical Success Factors (CSF) that influence the improvement of school management. These factors involve aspects such as: training, political pedagogical project, teaching tools, and perceived quality, besides contributing with data that corroborate the development of school management.

Methodology: The theoretical reference used to treat Rockart's CSF (1979) is Kolmogorov-Smirnov (1979). As the Kolmogorov-Smirnov method has a simplified application, the Paraconsistent Logic will also be employed, as it allows the natural treatment of divergences, inconsistencies and contradictions, as well as allowing the achievement of more precise results close to reality (Casarin, 2007).

Results: It was found that the use and prioritization of CSF can positively influence the performance of the school manager. It is important to clarify that schools are still companies that provide services and as such should consider the employment of strategies that improve their competitiveness, productivity, profitability and excellence. It is concluded that school management could improve its performance by using the prioritization of CSF in the following increasing order of importance: teaching tools, training, political pedagogical project and perceived quality.

Limitations: This work is restricted to the ten best schools in the city of Niterói, according to the concept in the National High School Exam (ENEM – *Exame Nacional do Ensino Médio*). This delimitation makes the results obtained subject to standards, such as behavior and market requirements.

Practical Implications: In addition to adding value to existing literature, it is hoped to stimulate studies around the proposed theme, aiming to increasingly assist school managers in the effectiveness of their actions.

Value and originality: Few studies have been found in the literature proposing the use of CSF to address management improvement in educational institutions. Therefore, this work intends to describe innovative proposals for this segment; to give the educational manager a prominent role in identifying and prioritizing the CSF; and, finally, to contribute with other works that evaluate the impact of the training of educators in the advancement of school management and in the quality of student care.

Keywords: critical success factors, perceived quality, training, political pedagogical project.



1. INTRODUCTION

Today, many parents neglect their children's education due to factors such as lack of time, unpreparedness, irresponsibility and the need to work. At the same time, these parents believe that the school has the responsibility not only to transmit knowledge by promoting student development and qualifying them for the job market, but also to create tools and strategies for them to dedicate themselves to study at home. According to Casarin (2007), parents went in search of better working conditions and neglected their children's education, delegating this task to the school. Therefore, it is of extreme importance that both schools and educators create the necessary conditions to optimize the students' learning process.

Currently, the labor market is increasingly demanding, a fact that fuels one of the greatest concerns of parents, educators and schools in relation to student achievement: their own perception of the importance of their studies for the future.

Deepening on this theme, it can be seen that the school, as an institution, often does not have the capacity to transform the social and family contexts in which the student is inserted. According to Gadotti (1995), the strengthening of education lies in its constant capacity to change behavior, that is, in breaking certain postures, overcoming dogmas and the ability to contradict oneself. Therefore, the educational sector is currently suffering from the change in terms of school responsibility, the new teaching concept and the role of the school as a social institution, as many believe that the school should play the role of parents. In this way, the school must overcome the primary concept assigned to it as a channel for social ascension and financial return, and become a tool for personal growth.

Educational institutions are increasingly trying, through their managers, to get parents more effectively involved in the school life of their children, giving more support in their extracurricular activities, because it is clear that these teaching-learning practices make the difference in student performance.

The school no longer attracts the attention of young Brazilians, due to the lack of commitment from school managers to improve current teaching practices. This fact proved, according to data from the National Institute of Educational Studies and Research Anísio Teixeira (INEP – *Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira*), collected from the school census conducted in 2018, that the number of high school enrollments fell by almost 5% in the last decade (2002-2012), demonstrating that students want the knowledge acquired in the classroom to be applicable to their daily lives and that significant content

can help the teaching-learning process. While for them the knowledge acquired in class is not relevant, high school completion increases the possibilities of insertion in the labor market. The study also revealed the urgency of young people to enter the market, as they tend to start working before even completing high school. Thus, it is important that educational institutions understand the reality of students and their expectations to meet these needs through more intentional pedagogical initiatives.

According to Lück (2009), the educational manager has the ability to organize and guide the development of a favorable environment for the promotion of learning and training of students, at the highest possible level, enabling them to face possible new challenges. Therefore, the quality of this professional must be considered fundamental for the growth and success of the students. Therefore, the role of the school and, in particular, the actions of the school manager determine the orientation and growth of young people during the school phase until their professionalization.

Another important aspect is the concern of educators about the impact of access to technology on the teaching-learning process. New technologies pose challenges for contemporary educators.

The school has a very traditional relationship in the student's learning process, where teachers show themselves as agents of the content to be learned by the students, in a very passive relationship. In the extra-school context, the new technologies present the information in an agile, attractive and quite distinct form in the school environment. According to studies by Hayward (2019), the advantage of information being accessed by students instantly is quite convenient, but it makes it difficult for them to develop more complex and critical thinking. That is, when students search the Internet to solve a problem, they stop using their brains to overcome any obstacle, and this is a disadvantage. In this way, young people become more and more dependent on machines, becoming incapable of complex cognition. However, the use of new technologies is an obstacle to be solved and has as a central question the way in which such a tool will be implemented, in order to be effective in this learning process.

Taking into account the school factors that can put learning at risk and the consequent integration into adult life, it becomes even more relevant, for the institution and its school manager, the study and employment of Critical Success Factors (CSF) as a strategic tool for the acquisition and effective transmission of knowledge. It is through them that it is possible to identify possible failures inherent to the business, preventing the school from being precarious in providing the service.



According to Rockart (1979), by monitoring the work environment, it allows the manager to better identify problems, plan more accurately and ensure improvement in the development of a company's tasks. However, this monitoring improves significantly by using the CSF prioritization technique, whose employment must be related to the various areas of the work environment and its organizational processes. The author also states that to be considered critical, the factor must be: (i) receive due attention and investment to ensure good performance, thus guaranteeing the success of the organization; (ii) be followed by information that allows its control and consequent corrective and improvement actions; and (iii) be strongly linked to the organization's business.

For Pestana (2003), the school does not need to change its identity; the preservation of its mission, character and values shows that, even when assuming an entrepreneurial posture, the school remains an educational institution.

It is essential that the school's principal (company) understands that their students (customers) represent the reason for the existence of their school, that their greatest assets are employees and teachers. And, mainly, as service providers, they need to continuously invest in human, scientific and technological resources (Pestana, 2003).

As a company, the school needs to meet the interests of a policy that emphasizes market demands. Therefore, the use of interactive and participatory practices within the school, corroborating the discourse around issues such as decentralization, participation and autonomy, are seen as primordial for the advancement of an educational institution towards the status of a corporate organizational structure.

When an educational institution assumes the role of a service provider company, its manager, in the figure of administrator, will need to seek more and more excellence in the provision of its services, besides improving the profitability of this company. However, evaluating services is a very complex task, that is, to measure the performance of an educational institution, the manager must: know the profile of its target audience (student); promote and monitor the performance of its various departments (secretariat, coordination, among others); monitor the behavior of the competition; improve the quality of services offered; increase interaction with students, parents, teachers and the community in which it is inserted; follow or transform itself according to market trends and expectations and prepare actions and plans for the future.

The school is dynamic and constantly changing. Therefore, it should be used as an instrument capable of social transformation. However, in assuming its position as

a service company, the school cannot neglect the search for profit. Therefore, it is very important that the manager harmonizes these two thoughts, taking the educational institution more and more to levels of good services provided to society, and at the same time achieving better results in the development of organizational structures.

Therefore, this article intends to expand academic knowledge about CSF and its innovative application in school management. Identifying CSF at different levels of a company, as an educational institution, is essential for competitiveness and allows increased productivity, profitability and excellence in the management services provided.

It is important to clarify that schools are companies that provide services, and as such they should also consider employing strategies that improve their competitiveness, productivity, profitability and excellence. Therefore, this work intends to describe innovative proposals for the segment of educational institutions; to give the educational manager a prominent role in identifying and prioritizing the CSFs; and to contribute with other works that evaluate the impact of the training of educators in the advancement of school management and in the quality of student care.

In order to achieve the proposed objectives, the work of several authors on human resources (HR), training, relationship quality, human and technological factors, CSF, perceived quality, and school management will be used in this study. Their works represent a great contribution in the areas of: HR, total quality, engineering, school administration, and education.

Regarding HR, Ulrich (2002) states that professionals in this area always need to reinvent themselves through new technologies, process reengineering and quality improvement teams. In addition, they need to determine the importance of human capital for the company. Finally, they must facilitate the execution of their own services in the area and evaluate the efficiency (cost) and effectiveness (quality) of their results.

According to Milioni (2000), it is essential to define the training needs and their importance for the company; for the work, involvement and leadership of the trainee; and to manage the organizational expectations regarding its results.

It would be essential to define training needs, their importance to the organization and to the work of the trainee. Moreover, for the management of the organization's expectations regarding its results, it is necessary to define the involvement of the trainees and the leadership (Milioni, 2000). However, according to Costa (2004), when considering the trainees, the requesting manager of the train-



ee, his superiors, etc., the analytical training report and the development may have variations.

Training has proven to be a key activity in business management. This role is due to the correlation between competence and optimization of results already observed in the early days of the manufacturing system, which places professional competence as an element of business effectiveness. It can also be understood as a motivational factor, bearing in mind that knowledge is one of the key elements driving job satisfaction, since it is not only remuneration that retains people in companies, but mainly talent. In this sense, training and development is a procedure through which the organization provides its employees with the training and learning that help in their development, thus being able to bring improvements to their performance and better satisfaction to their work environment (Baptista et al., 2002).

With regard to the quality of the relationship, Garbarino and Johnson (1999) and Smith (1998) define it, on the one hand, as the integral study of the effectiveness of the relationship between buyers and paper, which in this case is performed by students, sellers and educational managers. On the other hand, the adjustment in the relationship derives from the needs of the clients (parents and students).

Hennig-Thurau and Klee (1997) establish the following three aspects as foundations for relationship quality:

- (a) Customer's overall perception: the dimensions of the product or service, the assessment of the customer and the relationship with the company, which also impacts on customer retention, should be considered;
- (b) Trust: the emphasized process of generalization requires an initial sequence of experiences with an exchange partner, which provides the client the opportunity to judge its reliability. In the early stages of a developing relationship, the source for these experiences is the perception of overall quality, in which the customer corresponds to the performance of his supplier's internal standard;
- (c) Commitment: the high level of transactional quality provides the client with a positive repetition and reinforcement for having made the right decision, thus creating emotional bonds. But person-to-person interactions are more important and valid than the overall quality in meeting the customer's social needs related to transactions, products or services.

According to Quintella (1997), human and technological factors have as objectives the study, the applicability

of concepts, methodologies, evaluation techniques for the elevation, and the consequent increase of competitiveness in companies. All the subjects under study are related to executive decision making, therefore, the analysis performed must be of strategic nature.

2. METHODOLOGY

This research is based mainly on the hypothetical-deductive method of Popper (1975). Subsequently, all steps to achieve the objectives of this study will be described. The Kolmogorov-Smirnov model, developed by Rockart (1979), will serve to identify and describe the CSFs that help improve school management performance.

According to Marconi and Lakatos (1991), methodology choice must be determined by the proposition of the problem and its respective specificities, such as nature, object and resources of the research. For the purposes of this work, the specificities are detailed below:

- Nature: to identify the premises that will lead to a conclusion, through the verification of the analysis, identification and description of the CSF (training, political pedagogical project, teaching tools, and perceived quality), so that the hypotheses can be confirmed. That is, whether there will be improvement in school management with the prioritization and use of the CSF;
- Object: This research analyzes the CSFs that should be considered in order to increase the efficiency of school management, based on the instruments (Kolmogorov-Smirnov, 1979), and its premises tested and validated through data survey and analysis, in a process inverse to the inductive method;
- Available resources: generalizations will be employed because it is an innovative field for the segment of educational institutions, therefore as the bibliographical base is still restricted and because of the difficulty of relating the work to another research method, and with the need to achieve the proposed objectives, the works of several authors on human resources, training, relationship quality, human and technological factors, critical success factors, perceived quality, teaching tools, and school management will be used in this study.
- Existing theory: application of the CSF methods of Rockart (1979), with the objective of improving school management performance;



- Problem: demonstrate how the use of CSFs can improve school management;
- Deductions: Lakatos (1991) asserts that a scientific hypothesis must contain the ability to be proven false;
- Refestability technique: based on Mattar (1996) to prove or not a hypothesis, it is necessary to follow specific procedures and have clear objectives. The author proposes as a first step the determination of a hypothesis that denies the thesis in question;
- Test: in order to determine the validity of the hypothesis, a questionnaire will be prepared for data collection and, later, it will be directed to the educational manager;
- Analysis of results: through statistical inference, the results obtained in the test stage will be studied;
- Evaluation of the hypotheses: the output of the results analysis stage will allow conclusions to be drawn which corroborate or refute the hypotheses formulated.

The research was carried out in the following teaching institutions: Abel Institute, São Vicente School, Salesiano School, Marilia Mattoso School, Gay Lussac Institute, pH School, Pensi School, Objetivo School, Miraflores School, and MV1 School, directly with the school managers (directors and coordinators), during their working hours. Therefore, it was taken into consideration that the time used to answer the questionnaire could not be exceeded, otherwise it would compromise the work of the interviewees. It cannot be guaranteed that these teaching professionals were properly interested and motivated to answer both closed (multiple choice) and open (discursive) questions. In this way, the degree of veracity of closed responses cannot be guaranteed, as well as the absence of distorted discursive responses.

Another factor that could limit the results is the fact that the interviewer, as an understanding and admirer of the subject under analysis, can influence the responses of the managers of educational institutions (respondents). In addition, as the presentation and explanation of the items were under his/her responsibility, in the end, this may have influenced the behavior and information of the respondents.

A final factor that might have influenced the responses is the reason why some of the interviewees did not agree with the CSF pointed out for analysis in the questionnaire.

Data collection took place with prior consultation and scheduling at the educational institutions, together with the respondents, since the application of the questionnaire requires at least 20 minutes from each educational manager.

The data treatment took place right after the closing of the field research conducted in the ten schools in Niterói, mentioned above, by means of the questionnaires applied. For this, the Rockart's Kolmogorov-Smirnov method (1979) and Paraconsistent Logic were used. These data were tabulated in Excel spreadsheets that generated results that were analyzed in order to refute or validate the hypotheses of this work.

The discussion of the results aimed at assessing how close the hypotheses were to the truth, that is, the degree of truthfulness of the suggested hypotheses, because when the result deviates greatly from the truth, it is necessary to change the initial hypotheses. In this particular work, the following CSFs were investigated: training, political pedagogical project, teaching tools, and perceived quality.

The statistical methods were important to validate this work through the calculations referring to the Kolmogorov-Smirnov method used by Rockart (1979).

The analyses of the results, in addition to the conclusions, were carried out with the finalization of statistical methods and with the help of Paraconsistent Logic in refutation or validation of the hypotheses of this work. This is because, with the verification of each hypothesis and the answers given to the key questions, it was possible to analyze the results regarding the proposed problem and from that analysis to make inferences on the CSFs under study, as well as on the perceptions of the educational managers (respondents) of the sample.

The chart below lists the proposed problem and the above assumptions:

Chart 1. Relationship between the problem and the hypotheses

PROBLEM	HYPOTHESES	JUSTIFICATION
How will the use of CSFs improve school management?	The CSFs can positively influence the performance of the school manager.	Analysis, identification and description following the Kolmogorov-Smirnov Model (1979)
	The prioritization of the CSFs can optimize school management.	Analysis, identification and description following the Kolmogorov-Smirnov Model (1979)

Source: The author.



Thus, the general objective of this work is broken down into the following specific objectives:

Define the research methodology based on qualitative methods in the komolgorov-Smirnov model (1979), for analysis, identification and prioritization of the CSFs. This methodological model guarantees results closer to reality;

1. Investigate to provide greater security to educational managers by employing this new paradigm of application of the CSFs in the organizational and managerial model of their work activities;
2. Assess how the CSFs can positively influence the performance of the school manager and how the prioritization of CSFs can optimize school management;
3. Add value to the management of educational institutions and contribute to the expansion of academic literature of this kind.

3. RESULTS AND DISCUSSIONS

The hypothetical deductive method of Popper (1975) was chosen to be applied in the test of the hypotheses of this work. According to Vergara (2005), this type of research exposes characteristics of a certain population or phenomenon. It has no commitment to explain the phenomena it describes, although it serves as a basis for such an explanation. This paper describes the characteristics of the corpus under study, collects relevant data, and records variables that together will serve to determine responses to the problem. This exploitation constitutes an important competitive differential within organizations, in this case educational institutions. It is also important to clarify that the object of analysis of this work is of a non-probabilistic nature, that is, the corpus that composes the sample was determined following criteria of the researcher Pimentel (2006).

Lakatos (1991) states that a corpus consists of a set of elements (companies, products, or people) that possess the characteristics required to be the object of study. The corpus of this research is made up of managers (directors and/or coordinators) of private schools located in the city of Niterói/RJ and are people who deal directly and daily with the students of the schools researched.

Twenty school managers, aged between 35 and 50 years, with at least 10 years of experience as a teacher and who carry out their professional activities in the ten most recognized schools in the city of Niterói/RJ were studied. These schools have the same client profile, i.e. medium and high purchasing power students.

This work was restricted to the city of Niterói by the high concept of its students in the National High School Exam (ENEM – *Exame Nacional do Ensino Médio*), an evaluation that guarantees the access of high school students to public colleges in Brazil. Due to these limitations, the results are subject to behavior patterns and market requirements.

The sample size of the population studied must be finite; therefore, in order for the sample size to be representative of the population studied, the formula for the calculation of samples for finite populations was used (Malta de Oliveira, 2006).

In this case:

N = Population size;

σ^2 = Confidence level established, expressed in numbers of standard deviations. It is the one that will indicate the standard deviations from its mean. In a normal curve, the area comprising one standard deviation, one to the right and one to the left of the mean, corresponds to approximately 68% of its total. One standard deviation is equal to 68% of the confidence level. Two standard deviations are equal to 95.5% of the confidence level. Three standard deviations are equal to 99.7% of the confidence level.

p = Percentage with which the phenomenon occurs. It is the prior estimation of the percentage with which a phenomenon occurs; therefore, the smaller the percentage, the larger the sample size. The maximum value is 50%.

q = Additional percentage ($100 - p$);

e^2 = Maximum error assumed. The results of a survey obtained by means of a sample are not strictly accurate in relation to the universe from which they were extracted. These results always present a measurement error, which decreases in the proportion in which the sample size increases. It is expressed in percentages and in social surveys and usually an error estimate between 3% and 5% is used.

n = Sample size (what I want to know).

$$\frac{\sigma^2 \cdot p \cdot q \cdot N}{e^2 \cdot (N - 1) + \sigma^2 \cdot p \cdot q} \quad (\text{Malta de Oliveira, 2006})$$

Thus:

$$n (\text{school managers questionnaire}) = (1 * 3 * 97 * 20) / ((30 * 19) + (1 * 3 * 97)) = 8.26$$

$$n = 6.76\%$$



Table 2 below considers the nominal sample of schools, as well as the number of interviewees by area of activity in each educational institution.

In this work, the Komolgorov-Smirnov test, Paraconsistent Logic and Servqual techniques were used to process the data.

In this article, the lowest possible degree of significance was adopted ($\alpha = 0.20$), indicating as acceptable or proven a narrower range of the difference between the theoretical and actual distribution. Thus, even with a less restrictive criterion (lower degree of significance), as will be shown in the following chapters, no significant differences were found between the factors studied.

For Pimentel (2006), the Paraconsistent Logic method allows:

1. To conclude that, when there is a high degree of contradiction on an issue, there is still no certainty about the decision and, therefore, new evidence should be sought;
2. If there is a low degree of contradiction, a conclusion can be formulated as long as there is a high degree of certainty.

Paraconsistent Logic is very important for the conclusive process, because besides allowing the achievement of more precise results close to reality, it also allows the treatment with simplicity of divergences, inconsistencies and contradictions.

Finally, the Kolmogorov-Smirnov and Paraconsistent Logic tests were tabulated by question and applied. Such applications allowed analyzing the sample. The following steps were necessary for the data tabulation:

1. Count the frequency of each CSF chosen, for each pair of the 16 elaborated combinations – Question 1 of the field questionnaire;
2. Rejection frequency count of each CSF – Question 2 of the field questionnaire;
3. Consolidation of the CSFs pointed out by respondents as CSF – Question 3 of the field questionnaire;
4. Counting the frequency of scoring assigned to each of the CSFs, using a seven-point scale, where 1 refers to “totally disagree” and 7 to “totally agree” – Question 4 of the field questionnaire.

Tabulation of question 1 data

The question was formulated with the aim of providing the ordering of the four CSFs. These factors were combined in six pairs, in which the respondents, according to their perception, chose the most important critical factor. Table 3 shows the number and percentage of responses obtained per critical factor of the sample. The last line of the table indicates the maximum points that each of the factors could reach.

Table 1. Relationship between population and sample of the questionnaire respondents

QUESTIONNAIRE INTERVIEWEES					
QUESTIONNAIRE	POPULATION	SAMPLE	%SAMPLE	%MINIMUM	%
EDUCATORS	20	10	50.00	6.76	APPROVED

Table 2. Relationship between the nominal sample and educational manager

SAMPLE	SCHOOL MANAGERS	
	PRINCIPAL	COORDINATOR
(A) INSTITUTO ABEL	1	1
(B) SÃO VICENTE SCHOOL	1	1
(C) SALESIANO SCHOOL	1	1
(D) MARÍLIA MATTOSO SCHOOL	1	1
(E) GAYI LUSSAC INSTITUTE	1	1
(F) PH SCHOOL	1	1
(G) COLÉGIO PENSI	1	1
(H) OBJETIVO SCHOOL	1	1
(I) MIRAFLORES SCHOOL	1	1
(J) MV1 SCHOOL	1	1



Tabulation of data in question 2

This was formulated with the aim of identifying rejections among the four CSFs. The factors were listed and respondents were asked to exclude those considered non-critical to success. Table 4 indicates the quantities and percentages that each factor received in this question. The maximum possible number of rejections is the same number of respondents.

Tabulação dos dados da questão 3

The question was formulated with the objective of identifying new CSFs in addition to the three presented. Respondents suggested the inclusion of five more CSFs, as presented in Table 5.

Tabulation of question 4 data

4.1- The score frequency count was assigned to each of the CSFs, using the scale of 1 “totally disagree” to 7 “totally agree” – Question 4 of the field questionnaire.

1	Totally disagree	2	Strongly disagree	3	Partially disagree	4	Neither agree nor disagree	5	Partially agree	6	Strongly agree	7	Totally agree
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Tabulation of data from hypothesis 1

The objective of the question is to identify the CSFs that

Table 3. Tabulation of Question 1 - H1

Critical Success Factors Referring to Hypothesis 01	Resp. Qt.= 20	
	Scores	%
1.1 – Is training a CSF that improves school management?	26	21.7
1.2 – Is the political pedagogical project a CSF that improves school management?	36	30.0
1.3 – Are the teaching tools CSFs that improve school management?	14	11.7
1.4 – Is the perceived quality a CSF that improves school management?	44	36.7
TOTAL SCORES	120	100.0

Source: The author

Table 4. Tabulation of Question 2 - H1

Critical Success Factors Among those listed below, would you eliminate any CSF that could positively influence student performance outside the classroom?	Resp. Qt.= 20	
	Scores	%
2.1 – The training	1	5.0
2.2 – The political pedagogical project	2	10.0
2.3 – The teaching tools	1	5.0
2.4 – The perceived quality	3	15.0
2.5 – No	13	65.0
TOTAL SCORES	20	100.0

Source: The author

Table 5. Tabulation of Question 3 - New CSFs

Critical Success Factors In your opinion, is there any other CSF that increases the quality of service perceived by the management system? Which one?	Resp. Qt.= 20	
	Scores	%
1-No need to include new CSFs	8	40.0
2-Yes, include CSF for innovations	1	5.0
3-Yes, include CSF regarding the competence of educators	1	5.0
4-Yes, include CSF regarding emotional management	1	5.0
5-Yes, include CSF regarding playfulness	1	5.0
6-Yes, include CSF regarding the good relationship with clients	2	10.0
7- Yes, but no suggestions were made	6	30.0
TOTAL SCORES	20	100.0

Source: The author



most positively influence the teacher's performance in the classroom. In this way, five statements were made as possible influences, and for each of them the respondent was able to inform:

- Totally disagree - accounting for 01 point
- Strongly disagree - accounting for 02 points
- Partially disagree - accounting for 03 points
- Neither agree nor disagree - accounting for 04 points
- Partially agree - accounting for 05 points
- Strongly agree - accounting for 06 points
- Totally agree - accounting for 07 points

In this question, a scale with seven options was chosen because the Kolmogorov-Smirnov method, a theoretical

reference used to extract such influences, also makes use of a scale with the maximum of seven options. Thus, the maximum number that each influence indicated below could obtain is seven multiplied by the total number of respondents. Table 6 indicates the result obtained by the educational institutions under analysis.

Table 7 indicates the total points obtained for each item in Question 4 and their respective percentages.

Table 8 refers to the total scores obtained for each item in Question 4 related to their respective CSFs and percentage.

Tabulation of data from hypothesis 2

Table 10 indicates the total scores obtained for each item in Question 5 and their respective percentages.

Table 11 refers to the total points obtained for each item in Question 5 related to their respective Perceived Quality dimensions, according to Table 10 and their respective percentages.

Table 6. Tabulation of Question 4 - H1

The CSFs that most positively influence teachers' performance in the classroom.	1 Totally disagree	2 Strongly disagree	3 Partially disagree	4 Neither agree nor disagree	5 Partially agree	6 Strongly agree	7 Totally agree
4.1 – Is the improvement of the pedagogical team's training, i.e. the improvement of teaching practices, as well as better use of some teaching tools, fundamental to improve the quality of the attendance to the students, and consequently optimize the teaching practice?	0	0	0	0	3	7	10
4.2 - The more time is used in training the teaching staff of an educational institution, the greater will be the perception of students regarding the service provided by teachers?	0	0	0	1	3	6	10
4.3 - Does the use of new teaching technologies help teachers learn from students by improving the service they provide in the classroom?	0	0	0	0	4	11	5
4.4 – Is the understanding of the specific needs of your students, i.e. looking after their psychological well-being a critical success factor that improves teaching practice?	0	0	0	2	3	9	6
4.5 – Does the psychological well-being of teachers, both within and outside the school environment, influence their performance?	0	0	0	0	4	3	13
TOTAL SCORES	0	0	0	3	17	36	44

Source: The author

**Table 7.** Tabulation of Question 4

Hypothesis 1	Resp. Qt.= 20	
The CSFs that most positively influence the teacher's performance in the classroom.	Scores	%
4.1 – Is the improvement of the pedagogical team's training, i.e. the improvement of teaching practices, as well as better use of some teaching tools, fundamental to improve the quality of the attendance to the students, and consequently optimize the teaching practice?	127	18.7
4.2 – The more time is used in training the teaching staff of an educational institution, the greater will be the perception of students regarding the service provided by teachers?	125	18.4
4.3 – Does the use of new teaching technologies help teachers learn from students by improving the service they provide in the classroom?	121	17.8
4.4 – Is the understanding of the specific needs of your students, i.e. looking after their psychological well-being a critical success factor that improves teaching practice?	137	20.2
4.5 – Does the psychological well-being of teachers, both within and outside the school environment, influence their performance?	168	24.8
TOTAL POSSIBLE SCORES	678	100.0

Source: The author

Table 8. Tabulation of Question 4 - General Summary

Critical Success Factors (Hypothesis 1)	Resp. Qt.= 20	
The CSFs that most positively influence the teacher's performance in the classroom.	Scores	%
1.1 – Is the training a CSF that increases the teacher's performance?	252	37.2
1.2 – Are the proper teaching tools a CSF that increases the teacher's performance?	121	17.8
1.3 – Is the psychological well-being a CSF that increases the teacher's performance?	305	45.0
TOTAL SCORES	678	100.0

Source: The author

The data from Question 5 was also handled with Paraconsistent Logic. In this question, as informed, a scale ranging from 1 to 7 answer options was used. In order to enable score plotting on the unit square of the Cartesian plane of Paraconsistent Logic, the answers obtained were treated according to the criteria of belief and disbelief.

Table 12 shows the respective responses and corresponding scores. In addition, the degree of belief and disbelief is indicated for each element of Perceived Quality.

The belief values obtained are represented in the Unitarian Chart in the Cartesian Plan, according to Figure 1.

It should be noted that all CSFs (perceived quality, political pedagogical project, training, and teaching tools) obtained scores to be plotted in the area of the graph considered almost true, tending to the undetermined.

4. CONCLUSIONS AND RECOMMENDATIONS

The conclusions drawn from the results present suggestions for studies related to the subject researched that may be carried out in the future.

In Question 1, the teaching management was asked to verify in each of the six pairs which CSF would be most important to increase the influence of teaching practice. The application of the test allowed the ordering of the CSFs in the following degree of importance: 1 - perceived quality; 2 - pedagogical political project; 3 - training; and 4 - teaching tools.

Question 2 was formulated with the aim of identifying rejections among the four CSFs. It was found that the vast majority of respondents would not eliminate any of these CSFs mentioned. For the remaining teaching managers, perceived quality, political pedagogical project, training, and teaching tools would be eliminated in this order.

In Question 3 the educational managers were asked to inform whether there were any other CSFs that could improve school management. It was noted that for most there was no need to include new CSFs other than those presented. Some could not say, and others suggested five new CSFs (innovations, educators' competence, emotional management, playfulness, and good relationship with clients), aimed at pedagogical management to complement the manager's work.



Table 9. Tabulation of Question 5 - H2

The improvement of the teachers' management increases their professional performance.	1 Totally disagree	2 Strongly disagree	3 Partially disagree	4 Neither agree nor disagree	5 Partially agree	6 Strongly agree	7 Totally agree
5.1 – Does increasing educators' understanding of the need for new study tools improve their classroom management?	0	0	2	2	4	6	6
5.2 – Does prioritization of critical success factors improve teacher management in the classroom?	0	0	0	1	5	4	10
5.3 – Does the best qualification of the teachers improve their management?	0	0	1	1	2	5	11
5.4 – Does the awareness of teachers to improve their management increase their performance?	0	0	0	3	4	2	11
TOTAL SCORES	0	0	3	7	15	17	38

Source: The author

Table 10. Tabulation of Question 5

Hipótese 2	Resp. Qt.= 20	
The improvement of the teachers' management increases their professional performance.	Scores	%
5.1 – Does increasing educators' understanding of the need for new study tools improve their classroom management?	112	23.6
5.2 – Does prioritization of critical success factors improve teacher management in the classroom?	117	24.7
5.3 – Does the best qualification of the teachers improve their management?	124	26.2
5.4 – Does the awareness of teachers to improve their management increase their performance?	121	25.5
TOTAL SCORES	474	100

Source: The author

Table 11. Tabulation of Question 5 - General Summary

Perceived Quality (Hypothesis 2)	Resp. Qt.= 20	
The improvement of teachers' management increases their professional performance.	Scores	%
2.1 - To be able to dedicate more to teaching-learning practices, there is improvement in school management, increasing student performance.	355	14.8
2.2 - By taking better care of the company's human capital, there is improvement in school management, increasing student performance.	367	15.2
2.3 - By improving teaching tools, there is improvement in school management, increasing student performance.	235	9.8
2.4 - Having higher quality perceived by parents improves school management, increasing student performance.	602	25.2
2.5 - The possibility of recycling improves school management, increasing student performance.	235	9.8
2.6 - By fulfilling the school political-pedagogical project more effectively, it improves school management, increasing student performance.	600	25.1
TOTAL SCORES	2394	100

Source: The author



Table 12. Criterion Belief X Disbelief

Question 5: The improvement of school management increases the development of student autonomy, improving their performance.	Totally disagree		Strongly disagree		Partially disagree		Neither agree nor disagree		Partially agree		Strongly agree		Totally agree		Belief	Disbelief
	Pts	0	Pts	0.17	Pts	0.20	Pts	0.25	Pts	0.33	Pts	0.50	Pts	1.00		
1 - Being able to devote more to teaching-learning practices, there is improvement in school management, increasing student performance.	0		0		2		5		12		18		23		0.615	0.385
2 - By taking better care of the company's human capital, there is an improvement in school management, increasing students' performance.	0		0		1		4		11		15		27		0.616	0.384
3 - By improving teaching tools, there is improvement in school management, increasing student performance.	0		0		2		3		9		10		16		0.614	0.386
4 - Having higher quality perceived by parents improves school management, increasing student performance.	0		0		2		7		22		25		44		0.603	0.397
5 - The possibility of recycling improves school management, increasing student performance.	0		0		2		3		9		10		16		0.614	0.386
6 - By fulfilling more effectively the school's political-pedagogical project, it improves school management, increasing student performance.	0		0		0		6		14		17		40		0.760	0.240

Source: The author

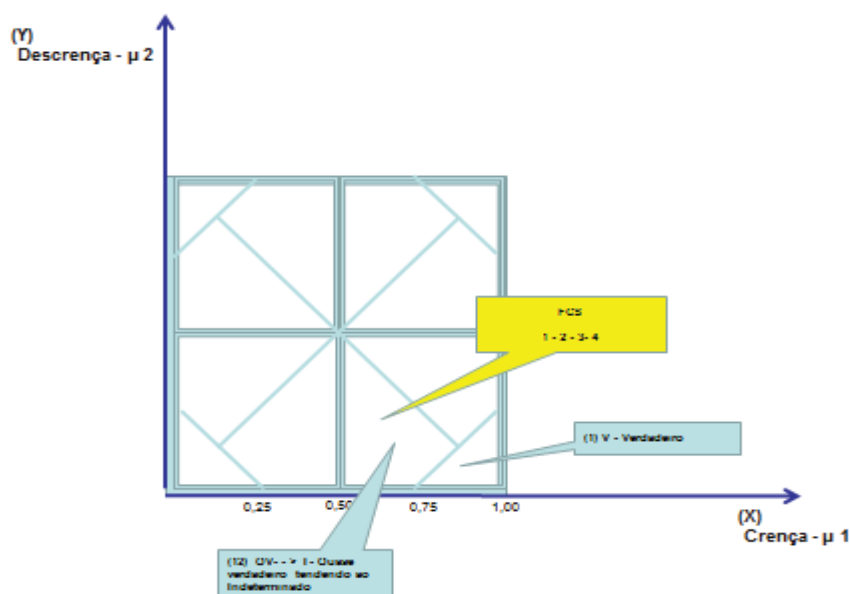


Figure 1. The Critical Success Factors Plotted in the Unitarian Chart in the Cartesian Plan of Paraconsistent Logic

Source: The author



In Question 4 the teaching managers were asked to give their opinion according to a questionnaire which included five statements as possible influences on the key questions of hypothesis 1, using a scale ranging from totally disagreeing to totally agreeing. From this analysis, data tabulation indicated that there was no statistically significant differentiation among the CSFs that improve school management (Kolmogorov-Smirnov test).

In Question 5, education managers were asked to give their opinion according to a questionnaire that included six statements as possible influences for the key questions of hypothesis 2, using a scale that ranged from totally disagreeing to totally agreeing. From this analysis, data tabulation indicated that there was no statistically significant differentiation between the CSFs that improve school management (Kolmogorov-Smirnov test). Paraconsistent Logic was also used and indicated that the CSFs are true, tending to be indeterminate, according to data plotted in the Unitarian Chart in the Cartesian Plan.

The use of CSFs improves school management; therefore, the research problem was investigated with the ten best placed educational institutions in Niterói, according to the ENEM ranking of the last five years: Abel Institute, São Vicente School, Salesiano School, Marília Mattoso School, Gay Lussac Institute, pH School, Pensi School, Objetivo School, Miraflores School, and MV1 School. For these schools, the problem was presented through the following two hypotheses:

- The use of CSFs can positively influence the performance of the school manager;
- The prioritization of the CSFs can optimize school management.

Both hypotheses were analyzed by the Kolmogorov-Smirnov test and the second was validated by the Paraconsistent Logic, through the Unitarian Chart in the Cartesian Plan of belief and disbelief.

Research on the CSFs and their influence on school management performance does not conclude this discussion. Several other studies could be further elaborated. Among the possibilities, the first would be a detailed analysis of the role and influence of each CSF in the daily life of school managers. The second is mapping and training for better use of CSFs by educational managers.

In addition, a study on the use of innovations, educators' competence, emotional management, playfulness and good client relations such as CSF, which lead to the best performance of the educational manager, is recommended.

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