Survey Report

The role of the Program Jovem de Futuro Supervisor – A comparative analysis between the states of Espírito Santo and Rio Grande do Norte

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RESUMO

Nesta pesquisa, temos como finalidade investigar e avaliar o efeito da atuação das supervisoras escolares na implementação do Management Circuitnas escolas que participam do Program Jovem
de Futuro. Aprofundando o estudo de Firpo, Bacalhau, Martins (2018), procuramos responder três perguntas. Primeiramente, queremos avaliar se o perfil da supervisora está relacionado com sua atuação no Management Circuit por meio das visitas técnicas às escolas. Complementar a isto, investigamos se sua atuação está positivamente correlacionada com medidas de resultado, delineadas pela teoria da mudança adotada pelo programa. Segundo este documento, a atuação da supervisora pode afetar as escolas em três dimensões distintas: na execução das tarefas, na gestão escolar, e no funcionamento escolar. Por fim, também observamos se o perfil da supervisora está relacionado diretamente a estes resultados de interesse. Temos também como objetivo identificar possíveis mecanismos desta atuação dentro da lógica da teoria da mudança do programa. Para efetuar estas investigações propostas, usamos o mesmo instrumento usado em Firpo et al (2018) para quantificar a Qualidade da Supervisão, pela percepção dos gestores escolares. Para abordar a segunda pergunta proposta, buscamos a correlação da qualidade da supervisão com as três dimensões de resultado da cadeia de efeitos da teoria da mudança. Por fim, para endereçar a terceira questão, usamos características observáveis e não observáveis das supervisoras. Dado que este instrumento foi aplicado no Espírito Santo, em 2017, e no Rio Grande do Norte, em 2018, expandimos a pesquisa por meio de uma análise comparativa entre os estados. A avaliação foi feita utilizando duas abordagens metodológicas: em um primeiro momento, utilizou-se uma análise fatorial exploratória, e, em seguida, conectamos a pesquisa ao modelo lógico do programa construindo um indicador de atribuições da supervisora. De forma geral, observamos nos dados, de forma descritiva, que a implantação do programa no RN está menos madura e as supervisoras parecem estar menos apropriadas dos procedimentos do que no ES. O efeito da qualidade da visita de supervisão

ABSTRACT

In this survey, we aim to investigate and evaluate the performance of school supervisors in the implementation of the Management Circuit, in schools that participate in the program *Jovem de Futuro* in Brazil. Deepening the study of Firpo, Bacalhau, Martins (2018), we try to answer three questions with this survey. First, we want to assess whether the supervisor's profile is related to its performance in the Management Circuit through technical visits to schools. In addition, we investigate whether its performance is positively correlated with outcome measures, outlined by the theory of change adopted by the program. According to this document, the role of the supervisor can affect schools in three dimensions: execution of planned tasks, school management, and school functioning. Lastly, we also look at whether the supervisor's profile is directly related to these outcomes of interest. We also aim to identify possible mechanisms of its performance within the logic of the program's theory of change. To perform the proposed investigations, we use the same instrument used in Firpo et al (2018) to quantify the quality of supervision, according to the perception of school managers. To address the second question posed, we sought to correlate the quality of supervision with the three desired outcomes of the theory of change's chain of effects. Finally, to address the third question, we use observable and non-observable characteristics of supervisors. Given that this instrument was applied in Espírito Santo (ES) in 2017, and in Rio Grande do Norte (RN) in 2018, we expanded our research and made a comparative analysis between these states. The evaluation was done using two methodological approaches: i) an exploratory factor analysis was used, and then ii) we connected the research to program's theory of change by creating an indicator of the supervisor's attributions. In general, the results show that the program's implementation in RN is less mature and supervisors seem to be less appropriated of the procedures than in ES. The effect of supervisory visit quality strongly correlates with the task execution indicator, through adherence to the program's protocol in both ES and RN. The attributions indicator reinforces this result, with greater margin for growth for the supervisor's

se correlaciona fortemente com o indicador de execução de tarefas, via aderência ao protocolo do programa, tanto no ES como no RN. O indicador de atribuições reforça este resultado com maior margem de ganho para atuação da supervisora no RN, onde as escolas ainda têm menor percentual de execução de tarefas. Quando testado o efeito da qualidade da visita de supervisão no indicador de qualidade da gestão, observamos que o ES, estado com mais maturidade no programa, foi o único onde foi possível detectar uma correlação positiva e estatisticamente significante, tanto via aderência ao protocolo quanto pelo indicador de atribuição. Em comparação, no RN, estado com menor maturidade do programa, não observamos nenhuma correlação entre a qualidade das visitas técnicas e as atribuições da supervisora por esta medida de resultado. Os resultados sugerem que a adesão aos protocolos e as competências desejáveis da supervisão são possíveis caminhos para atingir avanços na gestão escolar.

performance in RN, where schools have a lower percentage of tasks executed. When testing the effect of the quality of the supervisory visit on the management quality indicator, we observed that ES, the state where the program is most mature, was the only one where it was possible to detect a positive and statistically significant correlation, either by adherence to program protocols or by attributions indicator. In comparison, in RN, the state with the lowest program maturity, we did not observe any correlation between supervisory visit quality and supervisory duties through this outcome. The results suggest that adherence to program protocols and desirable supervisory competences are possible ways of attaining better management results.

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CONTENTS

1. Introduction

Program Jovem de Futuro (JF) offers a management model for schools, Regional Education Offices and State Departments of Education to assist managers in the school network to conduct a diagnosis of problems in their units and outline an action plan to overcome them. The program foresees implementing a Management Circuit, guided by management models designed in accordance with the PDCA technology: Planning, Execution, Monitoring and Evaluation, and Route Correction[1].

The Management Circuit Support professional (ACG) of program Jovem de Futuro, who is also called a school supervisor, is a technician of the Regional Education Offices of State Departments of Education responsible for conducting and supporting the JF in schools. It is up to the program supervisor to provide continuous assistance to managers in the group of schools under its responsibility in implementing the Management Circuit in accordance with the guidelines set forth in Instituto Unibanco's protocols and through biweekly technical visits. Their functions are broken down into four dimensions: be a tutor, complementing the training process of school managers and solving doubts and difficulties regarding the operation; be an advisor, helping analyze the causes and solutions for school problems and providing suggestions; be an intermediary, circulating information and articulating needs of the school with actions of the regional offices and state department; be a guardian, monitoring, verifying and seeing to that the specific actions in each state of the Management Circuit are fulfilled (INSTITUTO UNIBANCO, 2019). As such, the supervisor is a key agent of the program's Theory of Change[2].

Given this importance, this survey aims to evaluate the effect of the supervisor's performance, as well as their potential action mechanisms. We seek to understand to what extent the supervisor helps in executing and implementing the Circuit, investigating each stage of the PDCA. More specifically, want to verify the effect in three dimensions of the JF result, also set forth in the program's Theory of Change: execution of tasks, school management and school functioning. We analyzed how much these correlations are due to the supervisor's role, through the perception of school managers who the supervisor provides orientation to through technical visits.

Deep diving into the study of Firpo et al. (2018), this survey seeks to answer three questions:

1. Is the supervisor's profile related to its performance in the Management Circuit?

2. Does the supervisor's performance affect the result indicators pertaining to implementation of the circuit, management quality and school functioning?

3. Is the supervisor's role directly related to the results of interest?

Figure 1 – Survey questions

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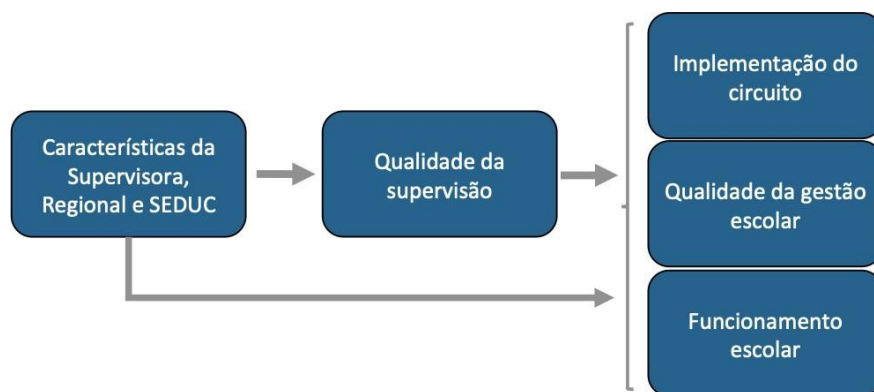
[1] PDCA is a tool that assists management. The PDCA (Plan, Do, Check, Act) method was disseminated by Dr. William Deming and is based on the scientific method of Francis Bacon. It was initially brought from Japanese auto companies to the management areas in various fields. The method emphasizes the need to plan, establishing measurable and feasible goals; act to achieve the objective; carefully check the goals created and the plan's progress; and, lastly, after a final evaluation of its state, adjust the plan, review goals and restart the cycle.
[2] theoretical guidelines that define the causality hypotheses and expected impacts of program Jovem de Futuro, outlined in the Instituto Unibanco document (2019).

 as such, we will evaluate the effects of the Management Circuit supervisor's performance and map potential mechanisms that generate results. We tried to identify new aspects in the profile of these professionals that are correlated to supervision in the Management Circuit. We also built on the previous survey in a spatial sense. In this survey, we included data from the survey done at schools that received program Jovem de Futuro in the state of Espírito Santo (ES) to take another look. We used this data from 2017 to compare the information with new field-survey data from 2018 of schools in the state of Rio Grande do Norte (RN). By adding a new field survey and information from another state creates a path for better understanding the mechanisms by which the program generates impact on learning in schools and the role of this key agent, i.e., the program supervisor.

To achieve the objective outlined above, we used different result measurements[3]. We use the experience of the third generation of Jovem de Futuro in RN, implemented as of 2017. For comparison purposes, we also used data from the program's third generation in ES, already analyzed in Firpo et al. (2018). We measured the quality of the program supervisor's performance through a survey instrument applied in schools, in which the school manager answers according to its perception about the technical visits made during the Management Circuit and about the supervisor's performance overall. We used the data from both field surveys, plus administrative data of the program and from the State Department of Education, to estimate the effects described in the objective and also potential mechanisms through which these results are being generated. The result variables tested are in three result dimensions of the program: execution of tasks, school management and school functioning. In general, the effects identified indicate that the supervisor's performance has a statistically-significant correlation with the execution indicator in ES and RN, pinpointing a mechanism in which the supervisor is capable of performing in the first effect level of the program's Theory of Change, regarding implementation of the Management Circuit. An alternative evaluation using supervisor competencies pertaining to their attributions shows a positive and significant effect only in RN, suggesting slightly different interpretations, however equally stressing that, in terms of evolution, both states achieved the Theory of Change's first effect level. In the second level of impact of the Theory of Change, we tested the correlation of the supervisor's performance with school management quality. In this moment, the distinction between states is clearer and we only see a statistically significant effect in ES, suggesting the program's greater maturity in this state, which is corroborated by the greater time under supervision of program Jovem de Futuro and also by the positive evaluations that supervisors receive from managers. Lastly, we measured the deepest level of the Theory of Change, which is the effect on school functioning. In this indicator, neither of the states presents significant correlations between the supervisor's performance and the school functioning indicator used.

This report is structured pursuant to the following description. In the next section, we present literature on the role of school supervisors. We then present the databases utilized. Lastly, we present the methodological approaches utilized, followed by the results found and final considerations.

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[1] The measures are detailed in section 3.4.

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2. Literature on school supervision

There is a considerable amount of international literature on the effect of school inspections and sanctions implemented on low-performing schools. Two major inspection and monitoring programs widely discussed in literature are conducted in the United States, by *No Child Left Behind Act*, and United Kingdom, by Ofsted (*Office for Standards in Education, Children's Services and Skills*).

For starters, we must point out that the school supervision process of program Jovem de Futuro differs considerably from what is outlined in these programs. However, it is possible to say that the inspections, as discussed in literature, can share some activities and, in general, have the same end objective as the technical visits of the program's supervisor. As such, this literature can provide is some inputs.

The inspectors, as verified in most of the work we reviewed, have the goal of improving education quality, which is fully aligned with the objective of the supervisors of program Jovem de Futuro. These agents make visits to schools, which differ in frequency, scope or context. It is these visits and their content that unleash a process of future improvement.

It is, for example, what we see in Ehren and Visscher (2008), who study the relationships between inspections, characteristics and improvements at schools in Holland. According to the definition of the authors, inspections aim to measure the quality of education and also encourage schools to develop a method to ensure the sustainability of their level of quality. In program Jovem de Futuro, these two goals are also present. The greater objective of ensuring an improvement in education quality is not alone, without the program's concern about creating sustainability so that, when it's work within the school network is concluded, the schools and regional education offices can continue with the good practices.

Within this scope, some studies show zero effect between inspection and improvements in student proficiency (e.g., HANUSHEK; RAYMOND, 2005; EHREN; VISSCHER, 2008; LUGINBUHL; WEB-BINK; DE WOLF, 2009; MATTHEWS; SAMMONS, 2004; ROSENTHAL, 2004). However, other studies provide evidence of a positive effect in this relationship (ALLEN; BURGESS, 2012; HUSSAIN, 2015).

Allen and Burgess (2012) and Hussain (2015) evaluate the Ofsted inspection program in the United Kingdom. Their methods differ, however, both utilize a high level of statistical rigor to explain the program's positive results. Allen and Burgess (2012), using a panel of schools of 10 years and a regression discontinuity design, report that schools that do not pass the inspection by just a bit show an improvement in tests in the following years. The magnitude of the effect is around 0.1 of one standard deviation in student tests.

Ehren and Visscher (2008) also find proof of a positive effect in inspections in general. This effect is even stronger when the school has a negative result in inspector evaluations. When this occurs, schools are instructed to prepare improvement plans for their weaknesses, as pointed out in the inspection reports. The authors suggest that this could be a mechanism by which the result is achieved, the evaluation produced by inspections serve as a lever for improvement. In Jovem de Futuro, we also observe the use of action plans and re-planning on the part of school managers, with help from the program's supervisors. In view that JF was created based on the PDCA management assistance tool[4], one very important stage of the program is called the Route Correction stage, in which the management group and their supervisors jointly review the action plan for the current year to redefine intermediary activities that can help achieve the goals not met within the timeframe stipulated or at risk of not being achieved by the end of the school year. Another aspect pointed out in the work of Ehren and Visscher (2008) is that the benefits might depend on the school culture and relationship between inspectors and schools. Relationship is another aspect we will review in this study. Openness to changes is perhaps a necessary element for schools to adapt to new processes following inspections.

In Gustafsson et al. (2015), the study aims to expand the area of knowledge, identifying and empirically testing mechanisms that link school inspections with activities that improve school performance. The authors point out that in most of Europe, the process that they call "school inspections" is an important tool used in school evaluations.

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[4] As presented previously, the PDCA tool is based on four stages: planning (plan), executing (do), monitoring (check), and acting (act).

The inspections, or whatever the process is called, measure the quality of education and ensure that schools remain responsible for a series of objectives related to student proficiency, teacher performance, organization and leadership of units. In many cases, the evaluations are conducted based on predefined criteria and standards and may involve sanctions for low performance (p. 47). Given the scope that the authors define as inspection, we can see a lot of similarity between this process and the supervision process of Jovem de Futuro, especially when it involves several layers of the educational process, particularly school leadership. In addition, the supervision of Jovem de Futuro is among those that have criteria and standards; however, it does not adopt sanctions for low performance. Within this context, we understand the terms supervision and inspection as referring to the same process of seeking school quality.

The survey conducted by Gustafsson et al. (2015), like ours, uses instruments that measure the perception of school managers regarding the supervision/inspection work. Based on these perceptions, they find evidence that supervision, initially, affects changes indirectly. This occurs with supervisors that use methods that foster development and learning processes, rather than top-down methods. Supervisors that define clear performance expectations and standards have an impact on the greater use of self-evaluations and in the development of school competencies to seek various types of continuous improvement, which is also the performance standard defined by program Jovem de Futuro.

Lavy and Boiko (2017) measure the effect of public education superintendents[5] on the educational results of children and schools and the potential channels of these effects. The authors identify that the quality of superintendents has a positive and significant effect on student performance: one standard deviation of improvement in supervision quality increases by 0.04 standard deviation the performance of students in the three disciplines tested. Certain heterogeneities were observed. For example, this result is higher for higher-quality superintendents, and female superintendents have a greater impact on student performance.

As literature suggests, there is great effect potential stemming from school supervisions in different forms. A major difference between the literature presented and the program studied herein is that, in many cases, sanctions are foreseen for schools that fail an inspection; it is what happens in school inspections in the United States (as a control tool of *No Child Left Behind Act*) and the United Kingdom. These works show supervision styles with a focus almost exclusively on accountability, and, therefore, are not the same type of supervision that Jovem de Futuro introduces into the educational system and schools where it is present. Supervisors of the program place greater focus on tutoring, advising and conducting the program's protocols, in addition to not having any type of sanction associated to the results obtained by the school or linked to the evaluation of supervisors. Within this context, the analysis of school supervision as proposed by Jovem de Futuro can contribute to literature by expanding findings on the different models of school monitoring, showing that there is still room to increase the effects already documented.

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[5] The role of superintendents in this work differs a bit from the supervision role adopted in program Jovem de Futuro. However, these results feed the hypothesis that different types of management can affect student learning. Generally speaking, this serves as foundation for our study and correlates with the supervision role in the program object of this study.

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3. Data

In order to achieve our goal of expanding the investigation of the role of the Jovem de Futuro supervisor and analyze the effects of this individual in the program, we used several sources of information. First of all, we are still researching the third generation of Jovem de Futuro, as well as in Firpo et al. (2018); for this survey, we used data collected from the state of Espírito Santo, as well as new primary data collected in the state of Rio Grande do Norte.

In this study, we use data referent to the year 2017 (ES) and 2018 (RN), working three dimensions:

• Characteristics of supervisors, regional education offices and state department of education;

• Quality of supervision;

• program result measures.

The data utilized and the survey procedures utilized are presented below.

3.1 Characteristics of supervisors, regional education offices and state department of education – Espírito Santo

As previously explained, this report builds on an investigation about the supervisor's role in program Jovem de Futuro. The 2018 survey focused on the program's performance in the state of Espírito Santo. For this comparative study, we are including information that was gathered and presented in the Firpo et al. (2018) report.

As such, the characteristics of supervisors, regional education offices and the state department of education used in this survey are administrative data information furnished by the State Department of Education (SEE) of Espírito Santo.

This information includes:

• supervisor names;

• whether they perform/performed the function of school inspector.

This data was used in Firpo et al. (2018) to qualify the profile of supervisors that monitor the programs schools and also as control variables to measure the

effect of supervisor performance in getting the school manager to adhere to the program or in the quality of school management.

In this report, we use the same qualifications, but with the objective of comparing the program's results in Espírito Santo with those of Rio Grande do Norte, and including new analyses in face of a closer interpretation of JF's logic model since then revised by Instituto Unibanco (2019).

Profile of the State Department of Education and its Regional Education Offices
In Espírito Santo, the State Department of Education (SEE) has 11 regional education offices, with 173 schools participating in program Jovem de Futuro. Of these, 24 are priority schools that receive a slightly different program protocol, with a greater number of supervisor visits. The state schools in the treatment group have a socioeconomic index (Inse) between 2 and 4[6].

And what do we know about the profile of the supervisor? During the 2017 school year in ES, 60 supervisors underwent the program, but not all of them were working for JF during the reference period of the survey. Each supervisor is allocated to one of the 11 regional education offices which report and measure the regional education office's interaction with the school. For ES, we did not obtain personal information on the supervisors from the SEE, except for the name and job function performed currently and before the program supervisor position[7].

The information available is provided in Tables 1 and 2 below. Of the 52 supervisors working in the schools during the reference period of the study, 21 (40%) occupied the position of inspector (they are called a school supervisor in Espírito Santo), and 31 (60%) were pedagogical technicians before taking on the position of supervisors of the JF Management Circuit. With regards to the supervisor's work in the program: each one monitors an average of four schools in the same regional education office. Each supervisor also possesses a reference technician associated to it – an SEE employee who accompanies and provides orientation. In 2017, five reference technicians worked in Espírito Santo, each one being responsible for an average of 12 supervisors[8].

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[6] The absolute Inse ranges between 40.27 and 54.07 (48.38 average). This figure is calculated and disclosed by Inep.

[7] In ES, supervisors originated from two careers within the state department of education: Inspector (or school supervisor) and Pedagogue. This difference in previous job position, which reflects the experience of each professional, can affect the manner how the relationship is built with the school. This heterogeneity was explored in Firpo et al. (2018).

[8] there isn't a detailed description of how the reference technician accompanies or monitors the program's supervision work. Each reference technician is associated to supervisors from a same regional education office. As such, we only used information from the regional office in our analyses.

Table 1 – Observable characteristics of supervisors from ES

Variable	Number of supervisors	Percent
Professional experience		
Inspector in the SEE (school supervisor)	21	40%
Pedagogical technician in the SEE	31	60%

Note: Table reproduced with data from Firpo et al. (2018).

Table 2 – Total schools and reference technicians per supervisor

Variable	Obs.	Average	Standard-deviation	Min.	Max.
Total schools monitored	60	4.32	0.72	3	5
Number of supervisors per reference technician	60	12.1	1.15	11	14

Note: Table reproduced with data from Firpo et al. (2018).

3.2 Characteristics of supervisors, regional education offices and state department of education – Rio Grande do Norte

To map the characteristics of supervisors, regional education offices and the state department of education, we requested administrative data information that already existed in the State Department of Education (SEE) of Rio Grande do Norte, but a field survey was also conducted with supervisors of the program in this state. We point out that, in RN, the supervisor is called a Management Circuit Support (ACG) professional, the official name of this person in the program. We will now treat the two terms in an equivalent manner.

Hence, we have the following information on 35 supervisors:

• Name
• Gender
• Age
• Time working in the State Department of Education
• School functions held prior to Jovem de Futuro
• Participation in school management courses besides IU ones
• Undergraduate degree

• Graduate degree

• Job functions besides the position of ACG

We utilized the set of data above to analyze in a descriptive manner the profile of supervisors. The database consists of 31 female supervisors and only 4 male supervisors, as shown in Figure 2. The age breakdown of supervisors shown in Figure 3 shows the greatest concentration in the 46 to 55-year-old bracket. We highlighted the average age, 50, which was used as control variable in the regressions for the state of Rio Grande do Norte.

Figure 2 – Gender distribution

■ Feminino   ■ Masculino
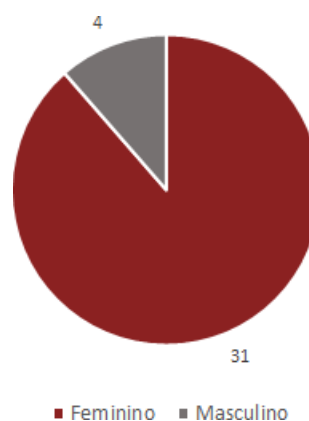
Figure 3 – Age distribution
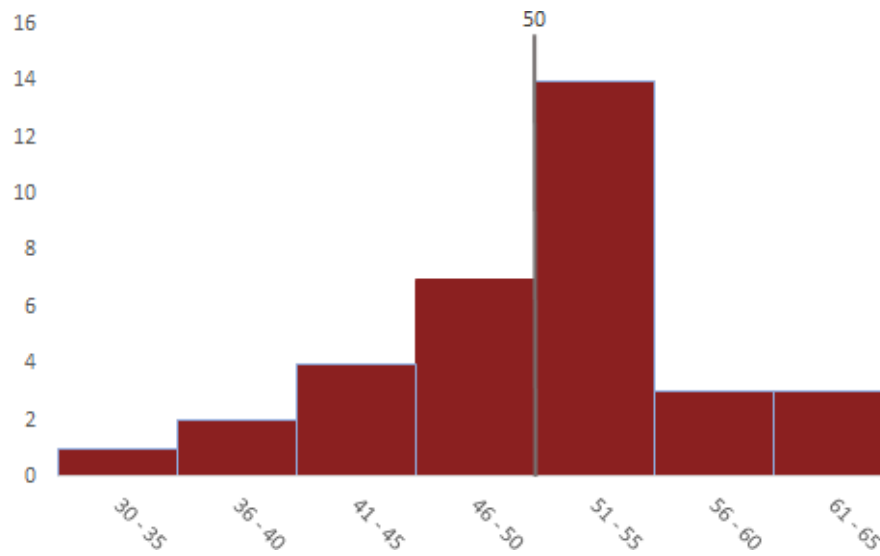
Figure 4 shows the breakdown for the number of years that supervisors worked in the State Department of Education until the moment the survey was conducted. We highlighted the 1st third of the sample, 18 years and the 3rd third, 27 years.

This data will also be used further ahead in the regressions for RN, as supervisor profile controls.

Figure 4 – Years in the State Department of Education
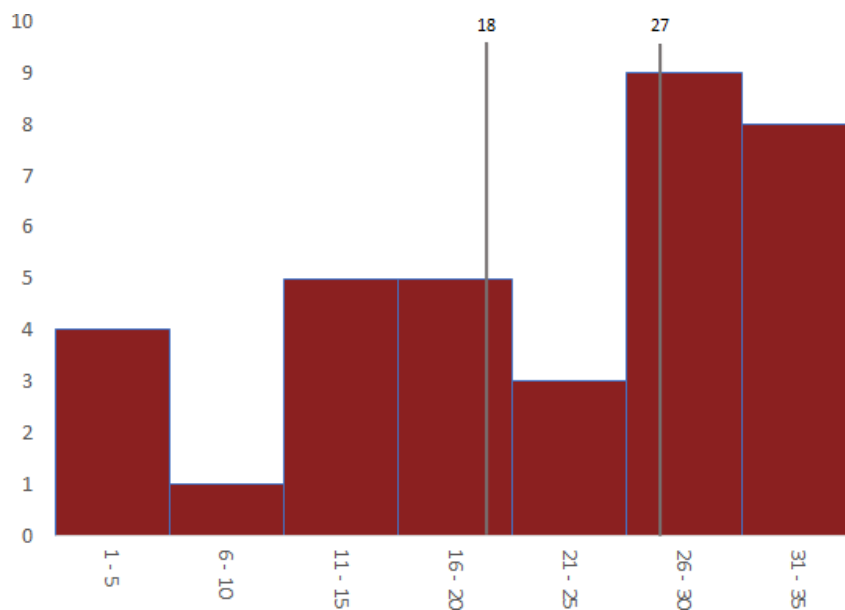
Now, in analyzing the job functions held by supervisors before becoming ACGs in Jovem de Futuro, we can see in Figure 5 that the most common functions were professors, pedagogical coordinators and regional office technicians.

Figure 5 – Functions held before ACG
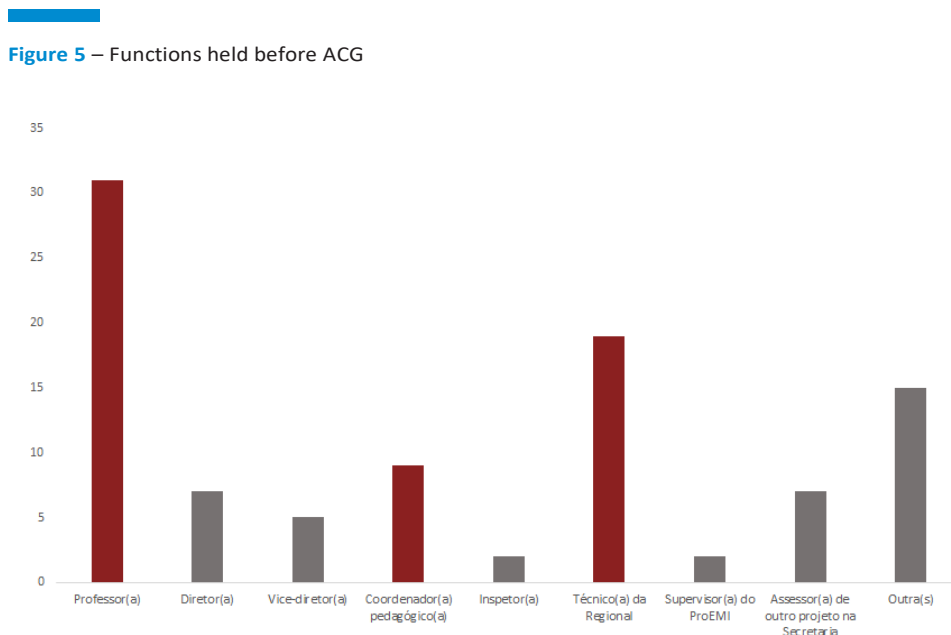
Information about participation in school management courses in addition to those provided by Instituto Unibanco – shown in Figure 6 – reveals a very balanced result among the supervisors: while 16 said they did not participate, 19 answered yes to the question.

If we divide the supervisors according to their undergraduate majors, as shown in Figure 7, we see a greater concentration in Pedagogy and Literature. Supervisors with degrees other than those listed above also represent a large portion of the sample.

Figure 6 – Participation in school management courses

Figure 7 – Undergraduate majors
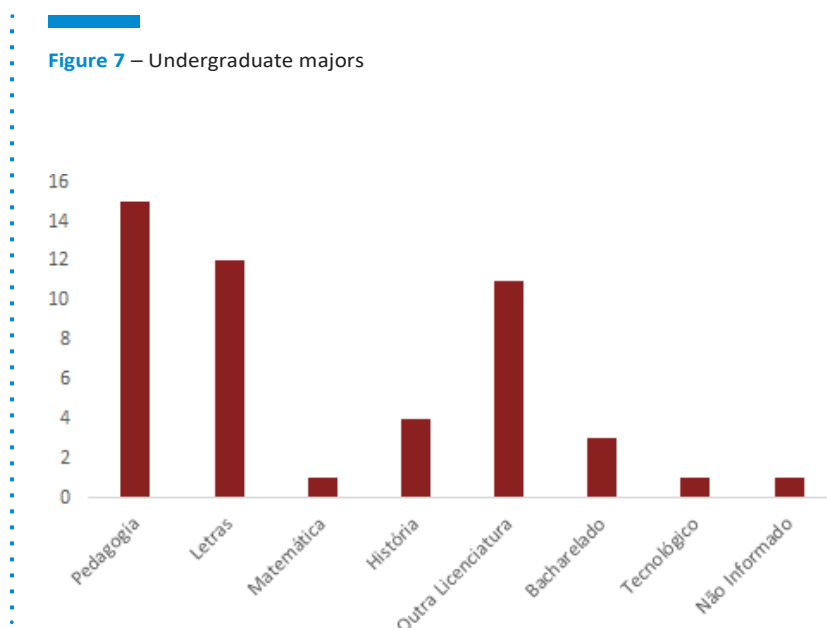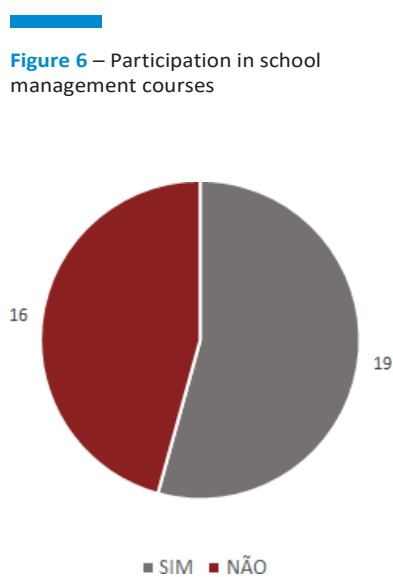
When asked about graduate courses, 30 supervisors mentioned having done specialization or development courses. Only two supervisors got a Master's degree. This information is reproduced in Figure 8.

Lastly, information about job functions besides the ACG position reveals that of the 35 supervisors, 14 hold other job positions, as shown in Figure 9. In other words, 40% of the supervisors still carry out other functions.

In terms of regional education offices, we know that there are 16 in the state of Rio Grande do Norte, totaling 142 schools, of which 19 are priority schools. In relation to the Inse, they vary between 1 and 4[9]. Note that the Inse variation for schools participating in the program in RN is higher than in ES.

Figure 8 – Graduate programs/degrees
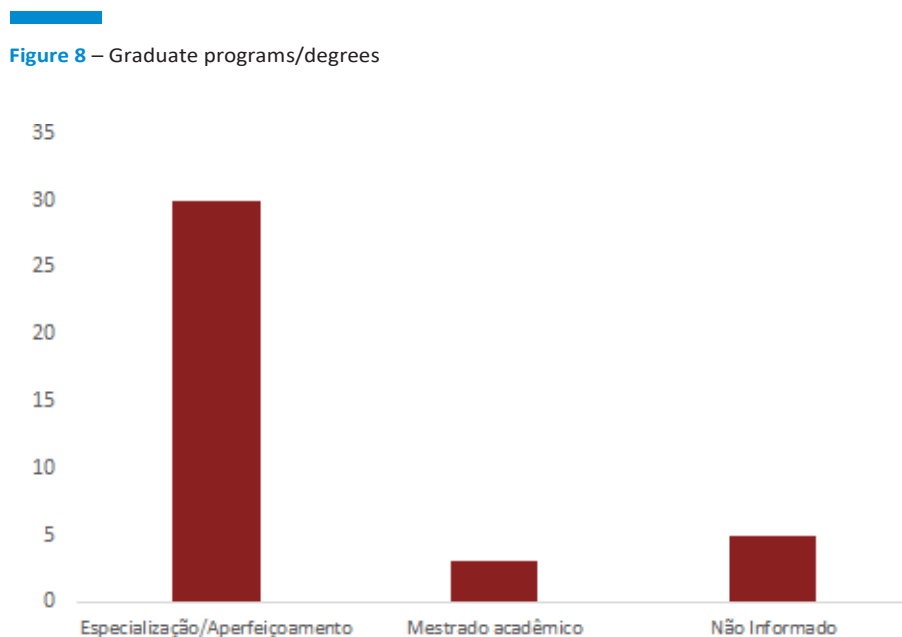
Figure 9 – Work in job positions besides that of ACG

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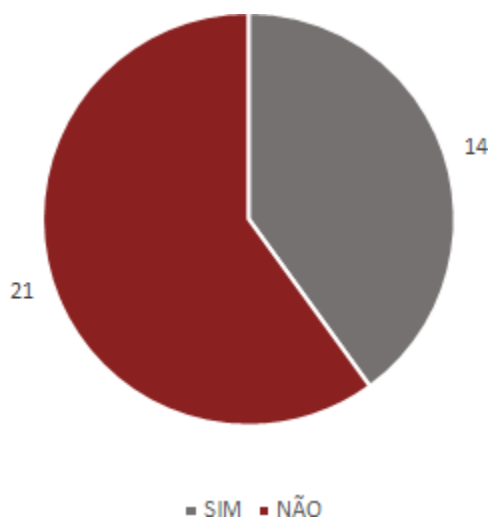
[9] This equals an absolute Inse between 34.72 and 54.11, with an average of 43.41.

3.3 Quality of supervision

In view that this survey is a continuation and expansion of the Firpo et al. (2018) survey, in order to measure the quality of supervision, we once again went into the field with the same questionnaire used in the previous[10]. The questionnaire was applied on managers of schools participating in program Jovem de Futuro. However, this time, the survey was applied in schools participating in the program in the state of Rio Grande do Norte. We maintained the same questionnaire precisely to be able to expand and compare results. As such, we will describe the two samples: of 2017 in the state of Espírito Santo, and of 2018, in the state of Rio Grande do Norte.

The questionnaire structure was created to specifically investigate the perception of managers in relation to the following nine dimensions:

1. Evaluation of the frequency of technical visits

2. Evaluation of the relevance of content of technical visits

3. Knowledge of processes and tools

4. Capacity to transmit knowledge

5. Support to the Management Circuit: Planning

6. Support to the Management Circuit: Execution

7. Support to the Management Circuit: Monitoring

8. Support to the Management Circuit: Actions taken in relation to problems

9. Relationship with managers

Presented below is the scenario of each state at the time the field survey was conducted.

> **Field configuration in ES**
>
> • Period the questionnaire was applied: July to August 2017
>
> • Reference period: 2017 school year up until the interview date
>
> • Type of interview: in-person, scheduled in advanced and confirmed by the manager, and conducted by a trained interviewer
>
> • Universe: 183 treatment schools in Espírito Santo under the impact assessment of Jovem de Futuro
>
> • Sample reached: 173 interviews conducted (10 schools left the program)

> **Field configuration in RN**
>
> • Period the questionnaire was applied: July to August 2018
>
> • Reference period: 2018 school year up until the interview date
>
> • Type of interview: in-person, scheduled in advanced and confirmed by the manager, and conducted by a trained interviewer
>
> • Universe: 141 treatment schools in Rio Grande do Norte Santo under the impact assessment of Jovem de Futuro
>
> • Sample reached: 141 interviews conducted

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[10] For more information about the questionnaire's construction, pretesting and questionnaire application method, see Firpo et al. (2018).

The period in which interviews were conducted, in both states and years, corresponded to the conclusion of the first cycle of the Management Circuit. All stages had already been executed at least once, with the exception of the Route Correction stage, which was in progress. As such, we estimated that school management would be capable of evaluating the performance of supervisors over the entire process, except for the last stage. School management could also evaluate the supervisor's knowledge and have built some type of relationship, in view that, at the time of the interview, several months of work would have already gone by since the beginning of the school year.

Field descriptions – ES x RN

With the results of the field survey mentioned above, we present descriptive statistics of the nine dimensions of the questionnaire: frequency of technical visits; relevance of the content of technical visits; knowledge of processes and tools; capacity to transmit knowledge; support in the Management Circuit in Planning, Execution, Monitoring and Actions taken in relation to problems; and relationship with managers.

Technical visits

This block of questions evaluates the satisfaction of managers with the frequency and relevance of technical visits made by the supervisor to the school bloc. The frequency suggested by the Management Circuit protocols is one visit every two weeks, except for the priority schools of the program, in which the frequency should be weekly.

Figure 10 – Frequency of technical visits
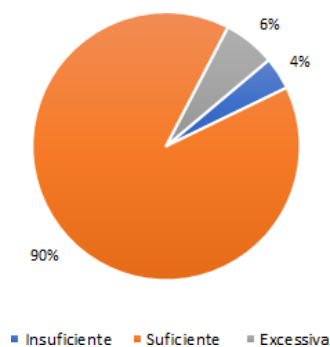
(a) Espírito Santo
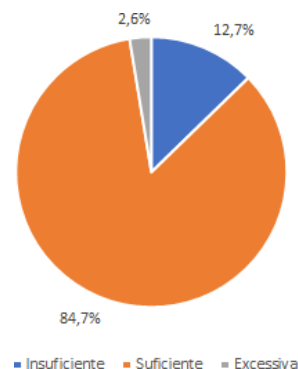
(b) Rio Grande do Norte

In relation to the satisfaction of managers with the frequency of these visits, on a scale of "Insufficient", "Sufficient" or "Excessive", 90% of managers in ES believed that it is "Sufficient". For RN, this figure drops to 84.7%, as shown in Figure 9. We also observed that, for RN, a greater number of respondents (12.7%) classifies the frequency of visits as insufficient. This may demonstrate an interest of this group for more information or more contact with the program's supervisor.

In relationship to the opinion of managers regarding the relevance of the content of technical visits, managers evaluated this aspect using the following scale:

1. Not satisfied at all

2. Not satisfied

3. Satisfied

4. Very satisfied

Figure 11 shows that the relevance of the content of the five types of technical visits received a positive evaluation in both states. In ES, 65% of respondents said they were satisfied and 31% very satisfied.

Figure 11 – Relevance of the content of technical visits
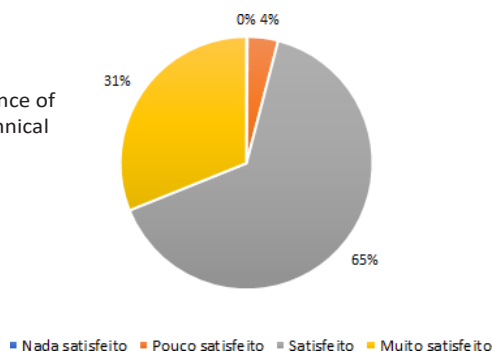
(a) Espírito Santo
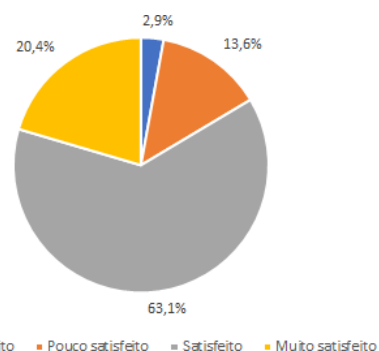
(b) Rio Grande do Norte

In RN, 63.1% of respondents said they were satisfied and 20.4% were very satisfied. In RN, those that were satisfied above the median with the content of visits totaled 83.4%, while in ES 96% of the total were. This, once again, suggests greater acceptance of the program in ES than in RN.

The last topic regarding technical visits – overall satisfaction of managers with the supervisor's work – reinforces the positive results previously shown. Figure 12 shows that in ES, 59% of managers said they were very satisfied with the supervisor's work. In RN, this figure is lower, 35.5%. Looking at the satisfaction totals above the median, in ES 96% say they are overall satisfied with the technical visits, while 86% of managers in RN feel the same, once again showing some perception differences between in the two states. It is also important to mention that in RN, 12.1% of managers are not satisfied with the visits, while in ES, this figure is only 3.5%. Once again there is greater dissatisfaction among managers from RN.

Figure 12 – Overall satisfaction with technical visits

(a) Espírito Santo

(b) Rio Grande do Norte
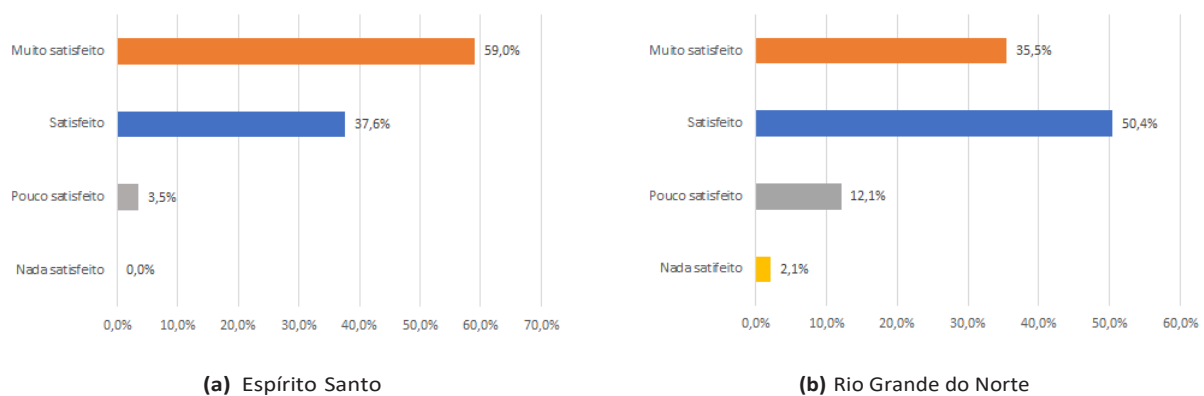
Knowledge

Giving continuity to the analysis, we sought to find out the level of satisfaction of managers in relation to the supervisor's level of technical knowledge. Figure 13 shows that almost 70% of managers said they were very satisfied in ES, while in RN, this approval rate drops to 34%. Even though RN appears with a higher percentage of respondents in the second level (satisfied), the sum of satisfactions above the median is still higher in ES (96%) than in RN (84%), repeating the pattern seen so far. In the "not satisfied" level, managers in RN once again appear with a much higher number of respondents: 12.8%, while only 3.5% of managers from ES demonstrate this dissatisfaction with the technical knowledge of supervisors.

Figure 13 – Overall satisfaction with the technical knowledge of the supervisor

(a) Espírito Santo

(b) Rio Grande do Norte
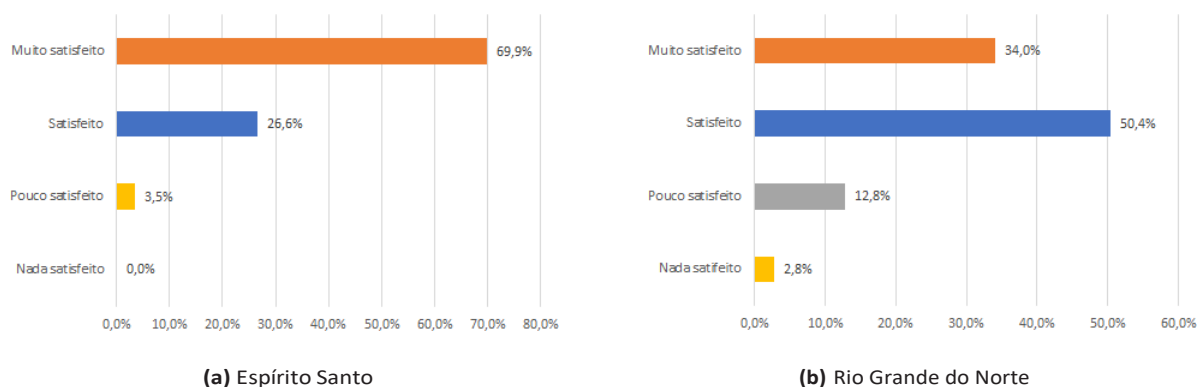
Next, we sought to learn the supervisor's level of knowledge and proficiency in matters related to the State Department of Education and program Jovem de Futuro in the perception of managers. This section of the questionnaire presented a series of statements, listed below, and requested the manager's agreement or disagreement according to the following scale:

1. Disagree

2. Somewhat agree

3. Agree

4. Strongly agree

Questions: knowledge about education and the state Department of Education

1. Supervisor has technical knowledge of the education area

2. Supervisor has difficulty interpreting components of the Ideb and Idea

3. Supervisor masters the programs and projects available in the Department

---

As Figure 14 shows, the manager's satisfaction with the supervisor's knowledge of these themes is quite high in ES, with 97% of managers rating their knowledge positively (when combining the two strongest levels of agreement). In RN, 88.4% of managers have the same level of agreement, that is, once again slightly below ES. Maintaining the pattern we see in RN, there is a group of almost 12% of managers who rate the knowledge of their supervisors negatively, while in ES this number is only 3%.

Figure 14 – Supervisor's knowledge about the State Department of Education and educational processes

(a) Espírito Santo

(b) Rio Grande do Norte
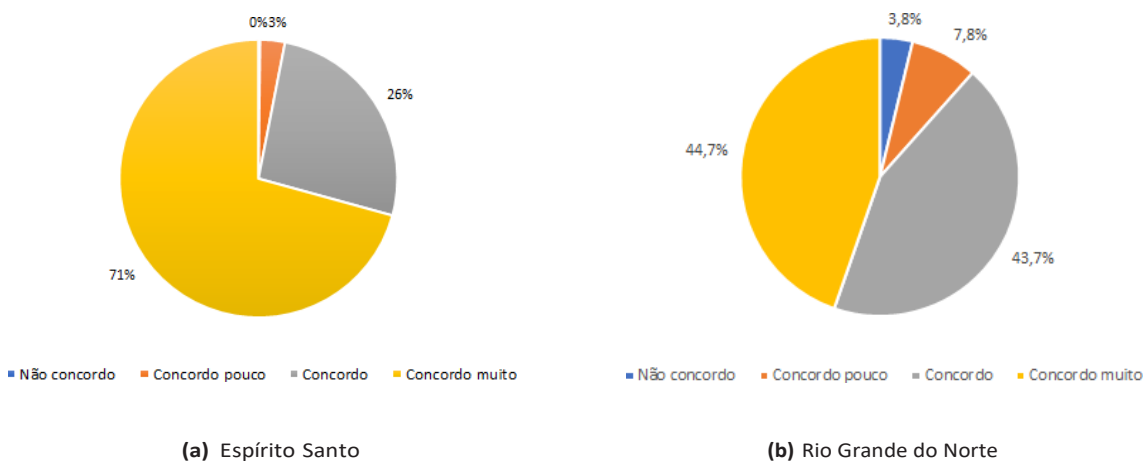
The last group of items in this dimension refers to the knowledge supervisors have of program Jovem de Futuro in the perception of managers. They were presented the statements listed below and answered according to their level of agreement.

> **Questions: knowledge of the program**
>
> 1. Knows the dynamics of the Management Circuit
>
> 2. Has difficulty interpreting structural indicators
>
> 3. Clarifies doubts on matters addressed in the results-based management training
>
> 4. Proposes ways for interpreting educational indicators
>
> 5. Discusses root causes that negatively affect the Idea
>
> 6. Provides orientation for making decisions based on proof
>
> 7. Assists in the utilization of the SGP as a management tool

Figure 15 shows that the supervisor's knowledge about the program is rated in a positive manner. The approval percentages in ES are approximately the same as the previous questions, with 97% of managers rating the supervisor's knowledge in a positive manner. In RN, the agreement rate in relation to this theme is 85.8%. Adding the two lowest levels of agreement, which suggest a more negative evaluation of the supervisor's knowledge about the program, we see that RN amounts to 14.2% and ES only 3%. This frequency confirms the pattern of differences between the two states in the same proportion as the previous themes.

Figure 15 – Supervisor's knowledge of program Jovem de Futuro

(a) Espírito Santo　　　　**(b)** Rio Grande do Norte
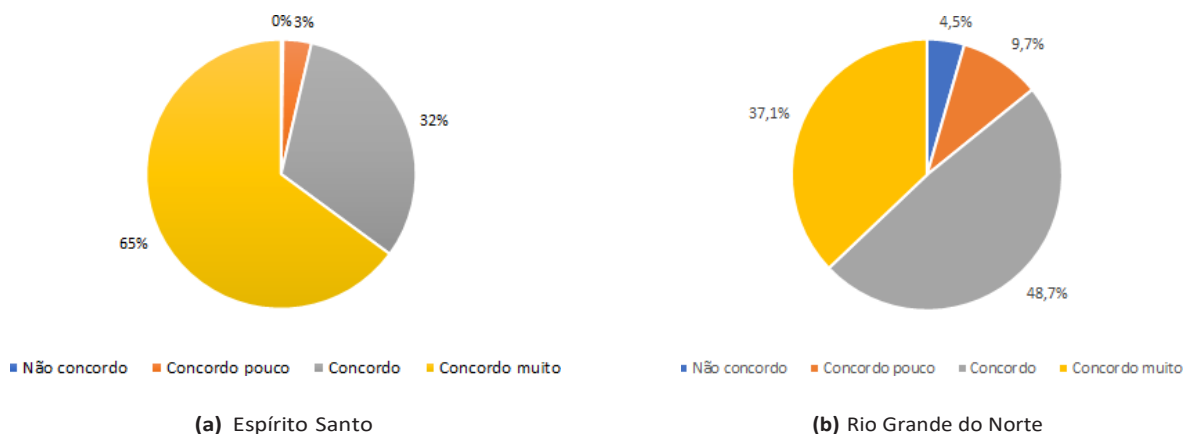
In the following items in the next items, we will focus the evaluation of the supervisor's performance in each area of the PDCA: Planning, Monitoring and Execution and Route Correction of the Management Circuit.

Support to the Management Circuit: Planning

In terms of planning, the supervisor's performance is well evaluated. We have listed in the table below the statements that were presented to the managers in order to check their level of agreement. We can see in Figure 16 that, in ES, we obtained a level of 95% of managers giving a good evaluation, while in RN this percentage was 86%. For the lower levels of agreement, representing a more negative evaluation of the supervisor's performance in terms of planning, in RN, we observe that 14% of respondents had this perception and in ES, only 5%.

Questions: Planning:

1. Supervisor appropriates the diagnostic, problems and needs of the school

2. Supervisor guides the forming of the group or manager duo before beginning the planning

3. Supervisor discusses the state's educational targets

4. Supervisor discusses the school's educational targets

5. Supervisor provides orientation on preparing a schedule for executing actions

6. Supervisor discusses the Dept. of Education's decisions and guidelines with the school

Figure 16 – Summary of the perception of managers regarding the supervisor's performance in planning items

(a) Espírito Santo

(b) Rio Grande do Norte
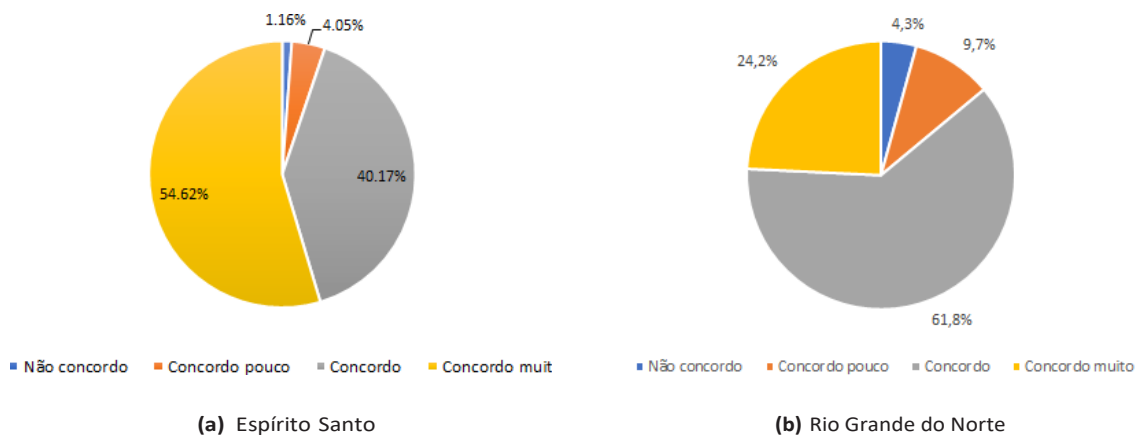
Support to the Management Circuit: Execution

The items in this group were prepared so that the statements refer to the frequency that important tasks are executed. A high-frequency is representative of good work. The statements are provided in the box below.

Questions: Execution

1. Frequency that the supervisor revises the action maps prepared in the Planning

2. Frequency that the supervisor provides orientation about continuously registering the progress of all actions

3. Frequency that the supervisor monitors if the Action Plan items are being executed

4. Frequency that the supervisor monitors if the Action Plan items are being registered in the SGP

5. Frequency that the supervisor provides feedback on requests submitted to the regional offices

In terms of support during the Execution moment of the Management Circuit, the supervisor's performance is once again very well evaluated. Figure 17 shows that, in ES, 95% of managers evaluate the supervisor's work positively. In RN, this rate drops to 86%. Once again, we observe a greater portion of respondents in the more negative region of the evaluation when they indicate a low frequency ("never" or "sometimes") in the execution of tasks. In RN, this proportion of more-negative evaluations was 14%, while in ES it was only 5%.

Figure 17 – Summary of the managers' perception regarding the supervisor's performance in Execution items

(a) Espírito Santo

(b) Rio Grande do Norte
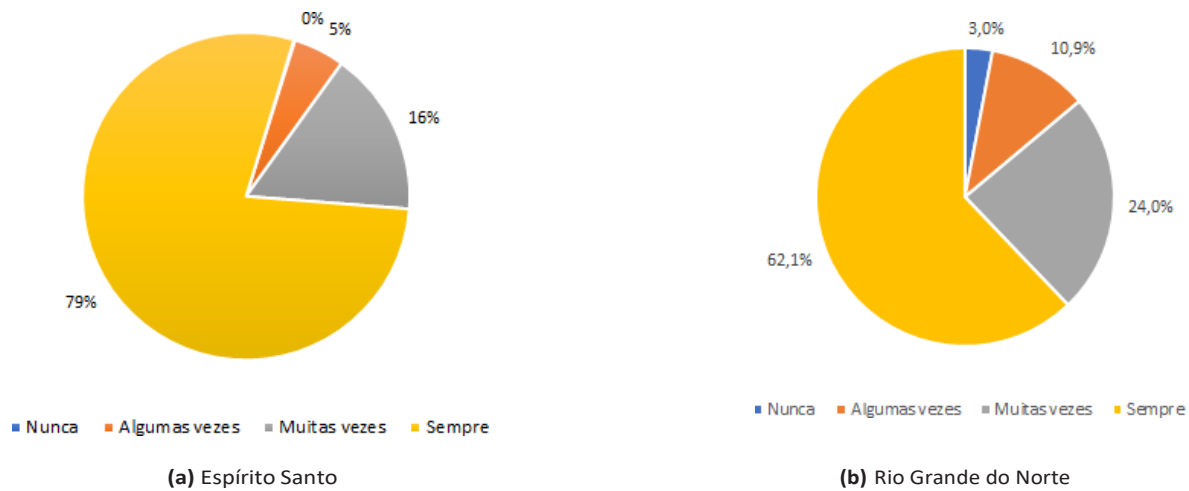
Support to the Management Circuit: Monitoring

The items of this group were also prepared so that the statements refer to execution frequency. Listed below are the monitoring statements presented to managers.

Once again, we see supervisor performance receiving an excellent evaluation. In ES, 96% of managers provided a positive evaluation for monitoring frequency. As in other dimensions of the survey, the positive evaluation was lower in RN, approximately 82%. The pattern of negative evaluations also repeats itself, however it increases considerably in RN. The proportion of managers with a negative perception about monitoring actions in RN is 18.3%. In ES, the proportion of negative evaluations is similar to that of previous items – 4%. The results are presented in Figure 18.

Questions: Monitoring

1. Frequency that the supervisor provides orientation on disseminating quarterly results in relation to the annual targets

2. Frequency that the supervisor assists in the identification of good practices

3. Frequency that the supervisor assists in the evaluation of the execution of tasks and delivery of products

4. Frequency that the supervisor analyzes structural indicators with ease

5. Frequency that the supervisor assists in the analysis of execution data that will be used in the Route Correction stage

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Figure 18 – Summary of the managers' perception regarding the supervisor's performance in monitoring items

(a) Espírito Santo

(b) Rio Grande do Norte
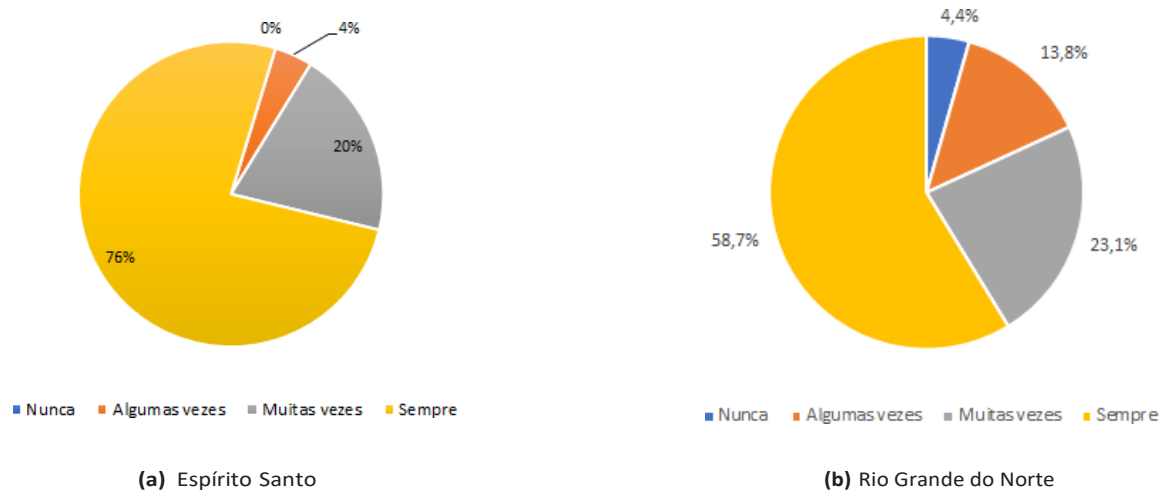
Support to the Management Circuit: Route correction

After seeing that the supervisors work well in the first three phases of the PDCA, we now arrive at the Route Correction stage. According to the perception of managers, this is the aspect least developed in both states.

Figure 19 shows that there is greater variability in the answers. In ES, 5.2% of managers state that some desired tasks are not executed; in RN, this figure is even higher, 12.1%.

In the second-worst level, in which supervisors execute a given desired task only sometimes, we see almost 16% of answers in ES in this level, and 22.3% in RN. Adding the two worst evaluation levels, we have 21.2% in ES and 34.4% in RN, a significant increase in negative evaluations. Even so, the performance of supervisors was well evaluated in this dimension, with 79% in ES and 65.6% in RN.

Listed below are the statements that were part of this set of the analysis.

Questions: Route correction

1. Frequency that the supervisor assists in reformulating actions

2. Frequency that the supervisor helps identify the causes of the problem

3. Frequency that the supervisor anticipates potential problems

4. Frequency that the supervisor proposes recommendations

5. Frequency that the supervisor forms study groups

6. Frequency that the supervisor listens to parties involved in the problem being faced

7. Frequency that the supervisor searches for bibliography on the topic

8. Frequency that the supervisor analyzes past experiences or experiences from other schools

9. F summary of the managers perception about the supervisor's performance in route correction items requency that the supervisor encourages work in network among schools

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Figure 19 – Summary of the managers' perception about the supervisor's performance in route correction items

(a) Espírito Santo

(b) Rio Grande do Norte
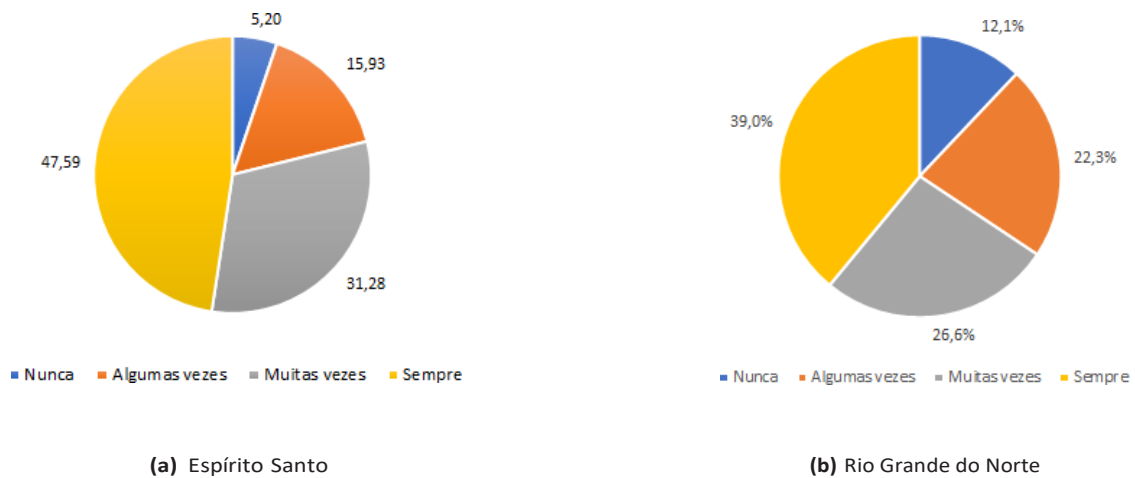
In order to better understand why this dimension received was relatively worse evaluated, we looked at each question to analyze which items managers were least satisfied with. As such, the activities that supervisors are less involved in are:

- Anticipate problems (ES: 4% never; RN: 11% never)

- Form study groups (ES: 14% never; RN:27% never)

- Search bibliography about a problem (ES: 15% never; RN: 26% never)

- Encourage work in network (ES: 9% never; RN15% never)

Relationship

This section of the questionnaire aims to identify what the relationship of school managers is like with their supervisors. We used the seven questions listed below to gain a general understanding of how the school manager perceives the positioning of the supervisor and its leadership.

In these questions, the manager was supposed to indicate its level of agreement with the statements proposed on a scale from 1 to 4:

1. Disagree
2. Agree somewhat
3. Agree
4. Strongly agree

Questions: Relationship

1. Is available for contact in the intervals between in-person visits

2. Encourages the manager to involve other people in the Action Plan

3. Supports the manager to assume the role of Management Circuit leader

4. Recognizes the work that the manager does in the school

5. Establishes of a relationship of trust with the manager

6. Is open to receiving criticisms, suggestions, opinions and contributions from managers

7. Meetings with the supervisor generate pressure and anxiety

The average proportions of responses are presented in Figure 20. Overall, the supervisor's relationship with the manager is always perceived as positive, but the evaluation in ES is more positive than in RN. In all the different questions, the majority answered at the highest level of agreement. While, in ES, 75.65% of respondents evaluated the supervisor's performance with utmost agreement, in RN this figure is 51.5%. Still agreeing with the supervisor's performance, we have 21.3% in the first state and 43.2% in the second. As such, positive evaluations total almost 97% in ES and almost 95% in RN.

Figure 20 – Relationship

(a) Espírito Santo

(b) Rio Grande do Norte
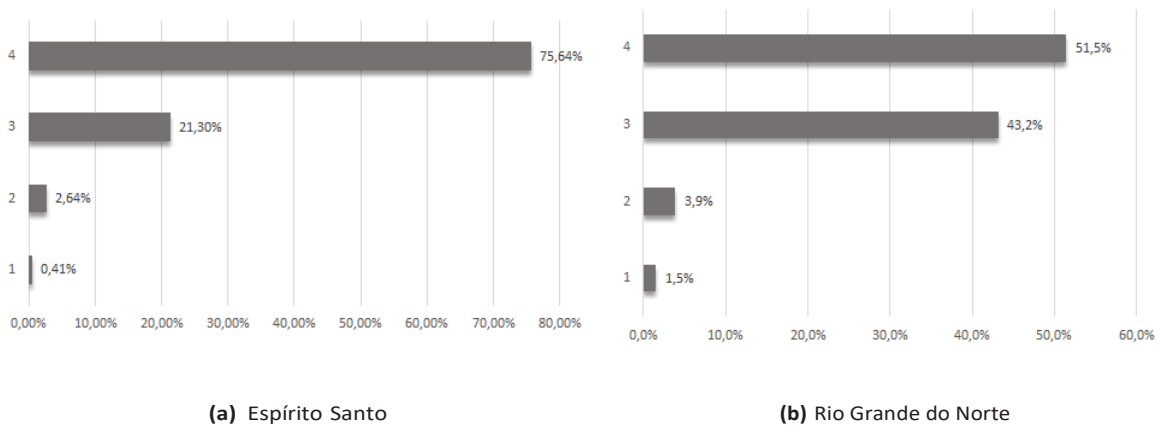
3.4 Result measurements of the program

According to the logic model of Jovem de Futuro, the continuous monitoring provided by supervisors, orienting the school manager and monitoring the execution of the school's Action Plan impacts the quality of school management in a positive manner (INSTITUTO UNIBANCO, 2019).

Figure 20 presents the program's logic model, highlighting the work of the program's supervisor. In this figure, we can see the following interaction activities of supervision with the Management Circuit:

•   Better supervision affects implementation of the Management Circuit

Figure 21 – Logic model of program Jovem de Futuro
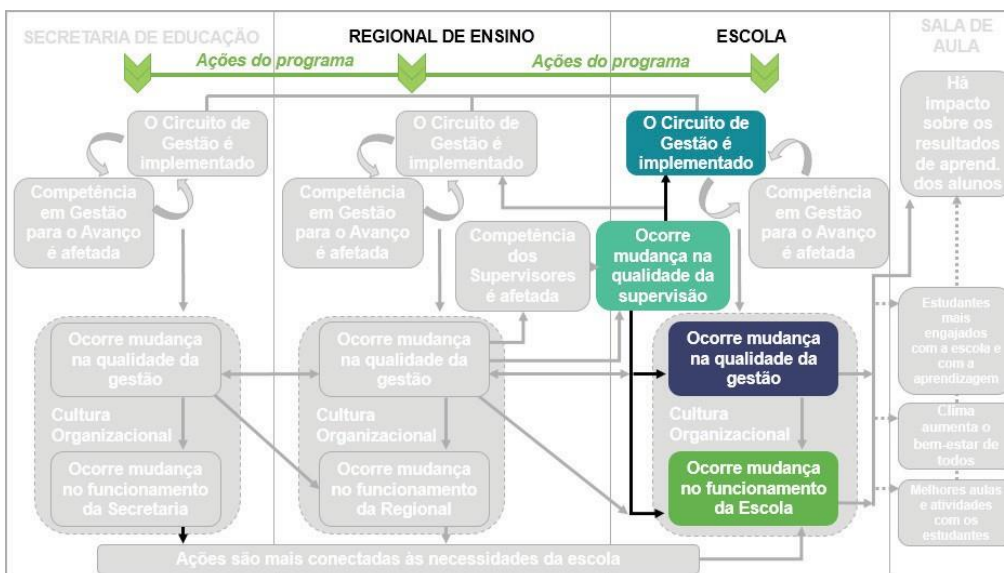
Note: this diagram highlights the supervision action area of the program in the school.
Source: Instituto Unibanco (2019)

- Better supervision affects the quality of school management

- Better supervision affects functioning of the school

- Implementation of the Management Circuit fuels the development of management competencies

- Implementation of the Management Circuit affects management quality

- Quality of management affects the improvement of school functioning

Based on these activities, the logic model assumes the supervision' performance along three dimensions: Implementation of Circuit, School Management Quality in School Functioning. Based on this, we defined three result measurements that correspond to each one of these dimensions, to wit:

1. SMAR execution indicator - Circuit implementation proxy, as it tracks a very important indicator of the Management Circuit, which is tasks completed.

2. Management quality indicator (MADEIRA; MELONI, 2018), which reflects the maturity of school management practices adopted by the manager.

3. SMAR result indicator - proxy for school functioning.

In summary, the logic model is based on is that the execution of tasks partially represents the Management Circuit in execution. Through execution of the Circuit, school management improves techniques and develops managerial competencies. The quality of management is the path for reaching the desired result in school functioning and student learning. And in this hypothesis is how we base ourselves in using these result indicators.

SMAR indicators. We will use the Results Monitoring and Evaluation System (SMAR) indicators for execution and result to measure the effect of the supervisor's performance along two dimensions: Implementation of Circuit and School Functioning.

Participants of the SMAR meetings, which are held with the objective of analyzing the performance of schools, include the management group of the unit and representatives from the regional office and central body. The orientation is that SMAR-type

meetings be held three times a year (INSTITUTO UNIBANCO, 2016). To hold SMAR meetings, two indicators are calculated and presented for each school:

- Execution indicator, calculated as an average of:

  o Execution percentage of tasks planned;

  o delivery percentage of products in the quarter analyzed.

- Result indicator, calculated as an average of:

  o student attendance, weighted by the percent fulfillment of this structural indicator in the SGP;

  o percent of classes given, weighted by the percent fulfillment of this structural indicator in the SGP;

  o percentage of students with grades above the average in the internal evaluation, according to information furnished by the State Department of Education.

As already mentioned, three SMAR meetings should be held during the school year in each state where the program is present. In this survey, we use data from the first SMAR in 2017 (ES) and 2018 (RN). At this same moment, the field that generates our measure of supervision quality was executed, stemming from the manager questionnaire.

Table 3 presents the SMAR indicator averages for the two states.

Management quality. The third measure we will use to measure the performance results of the program's supervisors is an indicator of the quality of school management. This indicator is fruit of a study on Jovem de Futuro conducted by Madeira and Meloni (2018). The authors adapted a questionnaire produced by the London School of Economics (LSE) to measure school management practices. The instrument, adapted to the educational context of Brazil, was applied via a telephone interview with the school manager following a predefined script. The survey was first conducted with the program's schools in Espírito Santo, in 2017, and then in Rio Grande do Norte, in 2018.

To create a measure of school management quality, the survey analyzed 13 dimensions pertaining to school management. The interviewer[11] classifies the answers in five levels of quality regarding management practices adopted by the school manager.

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[11] In ES, in the first version of the survey, there was one interviewer and a second person who listened to the interview and evaluated it. In RN, in turn, the survey was slightly adapted to have just an interviewer.

The answers to all dimensions of the questionnaire were grouped in order to build an average indicator that, according to the evidence of validity presented, measures school management quality of. As shown in Table 3, the average for this indicator of school management quality is 4.247, with the standard deviation of 0.519 for ES. For RN, the average is 3.924 with a standard deviation of 0.516. The statistical test of these averages confirms that, in fact, the management indicator average in ES is higher than the average for RN (with high significance).

In summary, for this survey on the role of supervision, we used as result measurements the Implementation of Circuit, Quality of Management and School Functioning. Our hypothesis is that, if the supervisor's performance adheres to what is set forth in the program's protocols, the school's management group will implement the Management Circuit in an effective manner, and this can be observed by the greater execution of Action Plan tasks (direct effect of the Circuit's implementation). In a second moment, after the management technologies are learned and absorbed by the management group, we assume that there would be a gain in school management quality. As such, we then tested the effect of supervision performance in the management quality indicator. In a third moment, after the assimilation and development of management practices, we expect to see an effect of supervision on the SMAR result indicator, which measures school functioning.

Table 3 – Result indicator descriptions

	ES		RN		
	Average	SD	Average	SD	p-value
Quality of management (overall average)	4.247	0.519	3.924	0.516	0.000
Indicator of result *Average: student attendance, classes given, proportion of students with grades above the average*	0.737	0.090	0.640	0.123	0.000
Indicator of execution *proportion of tasks and actions executed*	0.967	0.068	0.778	0.298	0.000
Number of observations	172		140		

Note: in quality of management, for ES, we only used the score of the first evaluator in order for the methodology to be comparable to the one used in RN in 2018.

4. Methodology

To satisfy the objectives of the survey, that is, evaluate the effects of the performance of the Management Circuit supervisors and map possible result mechanisms, we used two data analysis methodologies. First, we used an exploratory factor analysis (EFA[12]), taking advantage of the wealth of field survey data from two states (ES and RN). Then, we conducted an exercise of connecting the survey instrument used with the logic model of program Jovem de Futuro. These two methodologies proved being complementary. We describe these two stages of the study below.

4.1 Exploratory factor analysis

As presented in section 3.3 of this study, we took advantage of the opportunity of being able to conduct in RN, in 2018, the same field survey done in ES in 2017, with the objective of deepening and expanding the investigation on the role of supervision.

With the data from the survey in both states, we first did an exploratory factor analysis (EFA) to identify the latent constructs explained by the questionnaire[13]. This analysis was done using a single database of both states, because we believe that the instrument applied measures the same constructs, regardless of the location where it was applied. This is because the survey instrument refers to Jovem de Futuro (in its 3rd generation) and was built based on the program's protocols, which were used for implementation in both states. What may happen is observe different levels of quality in the supervisor's visit and/or different levels of program maturity in each state, which in fact we did observe[14], even so being the measures extracted from data representative of a same (or more than one) latent construct.

The EFA procedure was described in detail in the 2018 report (FIRPO et al., 2018), in which the analysis was done with data only from ES. The theoretical procedure we followed herein is exactly the same, however we now have a new set of data to analyze. As such, we will highlight the main steps, the indicators of the procedure's validity and, then, the constructs obtained in this analysis.

To use factor analysis, we followed the practices described in Hair et al. (2010), which states that some criteria must be satisfied.

> **Requirements for using factor analysis**
>
> - Sample size: minimum sample of 100 cases.
>
> - Ratio between the number of observations and quantity of variables: equal or greater than five.
>
> - Correlation pattern between variables: the majority of correlation coefficients must present values above 0.30; Kaiser-Meyer-Olkin (KMO) sampling adequacy test at least 0.60.

Our database satisfies all Hair criteria (above) and, after the EFA, all items maintained demonstrated the desired correlation patterns. See table below.

> **Requirements for using factor analysis**
>
> - Sample size: 314 schools.
>
> - Ratio between the number of observations and quantity of variables: 5.7 (maximum of 55 items).
>
> - Correlation pattern between variables:
>   - All correlations above 0.3.
>   - KMO: 0.96.

---

[12] The acronym refers to the English term Exploratory Factor Analysis.

[13] According to theory, exploratory factor analysis is done in an iterative manner, without the number of factors we expect to find being predetermined, which differs from a confirmatory factor analysis, which starts out with a theory. In this case, if each one of the dimensions evaluated in the questionnaire (already presented) constituted a latent factor, we would expect to find nine factors in the factor analysis. However, the questionnaire items (and, consequently, the dimensions) may be correlated with one another and, during the analysis, be grouped in a different manner, according to the correlation pattern. The exploratory factor analysis may indicate the existence of a number of factors different than the number of dimensions in the questionnaire.

[14] These different levels of program maturity, or quality of supervision, can be observed by the descriptive statistics presented in section 3.3.

To conduct the factor analysis, the criteria of sample size, ratio between the number of observations and quantity of variables, as well as the sampling adequacy measure known as Kaiser-Meyer-Olkin (KMO)[15], must have the minimum standards described in the table above. In view that the data is within the criteria described, we move forward with the factor analysis.

One criterion used for the selection of items is also a condition for executing the factor analysis: the majority of correlation coefficients between the items must have values above 0.30. The correlation matrix between items, presented in Figure 22, shows all the correlations above 0.30 in blue.

We see in this matrix that some items possess a low correlation with others, that is, low commonality. For example, items referent to evaluating the frequency of visits (q6a-q6e)[16]. This does not surprise us in view that "frequency of visits" is a piece of information stipulated in the program protocol, and should not be affected by the act of supervision.

The relevance of the content of visits (q7a-q7e), given that the content is also defined by the program, should also not be correlated with other items regarding management's perception about the act of supervision. However, this group of items possesses a correlation above 0.3 with the others. This may indicate that managers' perception regarding the relevance of content may be related to the role of supervision. This group will also be part of the process.

Items 11 and 12, regarding the knowledge that supervisors have about processes and tools, present a negative correlation pattern (not much above 0.3) with the other items of the instrument, but can be part of the factor analysis process.

Lastly, item 57, which refers to the relationship with managers, also shows a low correlation with the rest of the questionnaire. As such, we will also exclude this item due to low commonality[17] with the rest.

Figure 22 – Correlation matrix ES and RN

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[15] This measure varies between 0 and 1, and low values mean that the items are weakly correlated, not being possible to ensure an adequate factor analysis.
[16] We observed the same pattern in the 2018 survey with just ES data.
[17] Commonality is the proportion of variance of each variable that is explained by the common factors. High commonality is defined as being above 0.50 and indicates that the variables are linearly correlated. An item with low commonality should not be part of the latent constructs selected.

We excluded items regarding the evaluation of the frequency of visits and one item on the relationship with managers, all due to low correlation with the others and followed EFA procedures with the other 49 initial items. During the iterative process, several items will be eliminated in view that they have low commonality with the others.

In executing the iterative process of the factor analysis, calculating the accumulated variance and eigenvalues of factors, after each iteration, we eliminated the items with low commonality one by one and repeated the process until having a set of items with high commonality and a simple structure.

According to literature, the conditions for defining the number of factors and which items will be maintained are that (i) the accumulated variance of factors is less than 60% of the total variance and (ii) the eigenvalues associated to the factors are higher than one[18].

After conducting the iterative process of the EFA, two factors were determined that corresponded to the latent constructs captured in the survey. As shown in Figure 23, the eigenvalues of the first two factors are greater than one[19]. These two factors represent 87% of the accumulated variance.

After defining the number of factors, we made a final estimation of factor loadings. In the final version of items with high commonality, we have

Figure 23 – Factor analysis eigenvalues
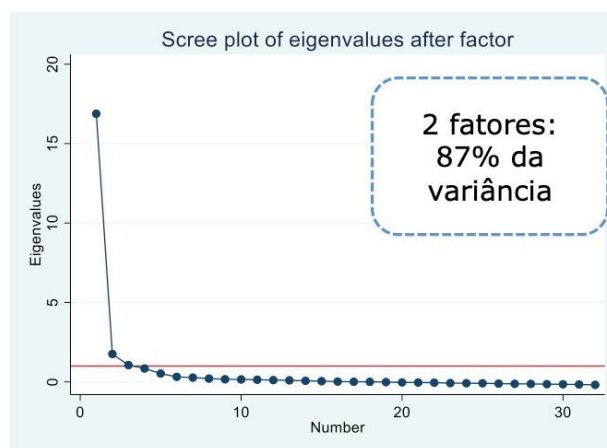
32, which matrix of correlation is shown in Figure 24. The correlation matrix between these items indicates a high correlation between them.

Table 4 presents the final items that added in factors one into their factor loadings[20], as well as the percentage of commonality. Figure 24 provides a graphic representation of factor loadings. This is a clear way to see how the items selected by the method load into distinct factors.

Lastly, in EFA, it is important to interpret the meaning of factors, that is, what the latent structure they represent is. We do this in a qualitative manner,

Figure 24 –ES and RN correlation matrix: final estimation of EFA

	q9	q10	q13	q14	q15	q16	q17	q18	q20	q21	q23	q24	q25	q26	q28	q29	q30	q32	q33	q34	q35	q36	q39	q41	q43	q44	q45	q51	q52	q53	q54	q55
q9	1,00	0,73	0,63	0,66	0,65	0,62	0,60	0,57	0,58	0,51	0,54	0,49	0,53	0,43	0,42	0,39	0,42	0,46	0,42	0,50	0,53	0,50	0,43	0,24	0,34	0,40	0,30	0,47	0,42	0,49	0,46	0,49
q10	0,73	1,00	0,66	0,68	0,69	0,67	0,66	0,65	0,64	0,56	0,61	0,59	0,59	0,55	0,51	0,46	0,46	0,52	0,50	0,55	0,58	0,57	0,48	0,30	0,42	0,48	0,40	0,52	0,55	0,59	0,56	0,54
q13	0,63	0,66	1,00	0,70	0,71	0,64	0,66	0,66	0,64	0,56	0,66	0,59	0,61	0,49	0,49	0,46	0,50	0,46	0,53	0,52	0,55	0,60	0,51	0,36	0,47	0,43	0,41	0,50	0,50	0,46	0,49	0,48
q14	0,66	0,68	0,70	1,00	0,75	0,70	0,75	0,75	0,67	0,58	0,64	0,58	0,63	0,55	0,56	0,50	0,45	0,53	0,56	0,56	0,56	0,60	0,52	0,39	0,46	0,48	0,44	0,51	0,59	0,55	0,53	0,52
q15	0,65	0,69	0,71	0,75	1,00	0,77	0,76	0,69	0,68	0,63	0,70	0,62	0,65	0,54	0,50	0,45	0,45	0,52	0,54	0,55	0,63	0,57	0,55	0,43	0,47	0,51	0,46	0,46	0,51	0,45	0,47	0,49
q16	0,62	0,67	0,64	0,70	0,77	1,00	0,78	0,68	0,68	0,66	0,69	0,62	0,65	0,54	0,51	0,47	0,47	0,52	0,52	0,56	0,55	0,53	0,42	0,46	0,46	0,46	0,54	0,51	0,50	0,50	0,50	0,51
q17	0,60	0,66	0,66	0,75	0,76	0,78	1,00	0,75	0,67	0,66	0,66	0,60	0,63	0,56	0,57	0,55	0,49	0,57	0,57	0,57	0,56	0,59	0,57	0,45	0,48	0,51	0,43	0,53	0,57	0,56	0,52	0,54
q18	0,57	0,65	0,66	0,75	0,69	0,68	0,75	1,00	0,60	0,64	0,65	0,62	0,66	0,57	0,56	0,55	0,48	0,60	0,56	0,56	0,58	0,60	0,53	0,47	0,49	0,52	0,45	0,54	0,55	0,59	0,54	0,58
q20	0,58	0,64	0,64	0,67	0,68	0,68	0,67	0,60	1,00	0,70	0,75	0,64	0,67	0,51	0,53	0,43	0,48	0,51	0,51	0,49	0,49	0,52	0,52	0,39	0,41	0,47	0,41	0,54	0,54	0,49	0,50	0,48
q21	0,51	0,56	0,56	0,58	0,63	0,66	0,66	0,64	0,70	1,00	0,72	0,62	0,60	0,50	0,47	0,43	0,42	0,48	0,47	0,51	0,49	0,50	0,42	0,43	0,48	0,41	0,49	0,54	0,49	0,46	0,46	0,46
q23	0,54	0,61	0,66	0,64	0,70	0,69	0,66	0,65	0,75	0,72	1,00	0,72	0,69	0,56	0,56	0,51	0,48	0,56	0,51	0,50	0,58	0,58	0,52	0,42	0,41	0,50	0,47	0,56	0,57	0,55	0,52	0,53
q24	0,49	0,59	0,59	0,58	0,62	0,62	0,60	0,62	0,64	0,62	0,72	1,00	0,66	0,54	0,49	0,50	0,39	0,46	0,48	0,56	0,50	0,49	0,50	0,36	0,47	0,50	0,47	0,51	0,49	0,55	0,55	0,53
q25	0,53	0,59	0,61	0,63	0,65	0,65	0,63	0,66	0,67	0,60	0,69	0,66	1,00	0,50	0,51	0,50	0,45	0,56	0,49	0,55	0,49	0,50	0,50	0,41	0,43	0,47	0,45	0,52	0,50	0,51	0,52	0,46
q26	0,43	0,55	0,49	0,55	0,54	0,54	0,56	0,57	0,51	0,50	0,56	0,54	0,50	1,00	0,65	0,56	0,56	0,54	0,62	0,62	0,55	0,63	0,54	0,42	0,45	0,54	0,53	0,46	0,47	0,46	0,42	0,43
q28	0,42	0,51	0,49	0,56	0,50	0,51	0,57	0,56	0,53	0,47	0,56	0,49	0,51	0,65	1,00	0,74	0,55	0,60	0,62	0,62	0,60	0,60	0,50	0,39	0,34	0,43	0,43	0,52	0,43	0,41	0,45	0,40
q29	0,39	0,46	0,46	0,50	0,45	0,47	0,55	0,55	0,43	0,43	0,51	0,50	0,50	0,56	0,74	1,00	0,53	0,58	0,59	0,64	0,55	0,63	0,41	0,35	0,33	0,45	0,44	0,49	0,44	0,47	0,49	0,42
q30	0,42	0,46	0,50	0,45	0,45	0,47	0,49	0,48	0,48	0,42	0,48	0,39	0,45	0,56	0,55	0,53	1,00	0,52	0,62	0,58	0,51	0,54	0,49	0,41	0,41	0,47	0,48	0,41	0,35	0,33	0,38	0,39
q32	0,46	0,52	0,46	0,53	0,52	0,52	0,57	0,60	0,51	0,46	0,56	0,46	0,56	0,54	0,60	0,58	0,52	1,00	0,62	0,65	0,61	0,66	0,50	0,42	0,44	0,50	0,47	0,45	0,42	0,46	0,44	0,41
q33	0,42	0,50	0,53	0,56	0,54	0,52	0,57	0,56	0,51	0,48	0,51	0,48	0,49	0,62	0,62	0,59	0,62	0,62	1,00	0,70	0,59	0,64	0,59	0,44	0,45	0,50	0,52	0,45	0,44	0,41	0,42	0,38
q34	0,50	0,55	0,52	0,56	0,55	0,56	0,57	0,56	0,49	0,47	0,50	0,56	0,55	0,62	0,62	0,64	0,58	0,65	0,70	1,00	0,67	0,71	0,55	0,45	0,47	0,57	0,56	0,49	0,43	0,39	0,41	0,41
q35	0,53	0,58	0,55	0,56	0,63	0,56	0,56	0,58	0,49	0,51	0,58	0,50	0,49	0,55	0,56	0,55	0,51	0,61	0,59	0,67	1,00	0,76	0,55	0,45	0,48	0,58	0,55	0,39	0,47	0,42	0,40	0,40
q36	0,50	0,57	0,60	0,60	0,57	0,55	0,59	0,60	0,52	0,49	0,58	0,49	0,50	0,63	0,60	0,64	0,54	0,66	0,64	0,71	0,76	1,00	0,54	0,44	0,49	0,55	0,55	0,44	0,49	0,45	0,43	0,42
q39	0,43	0,48	0,51	0,52	0,55	0,53	0,57	0,53	0,52	0,50	0,52	0,50	0,50	0,54	0,50	0,41	0,49	0,50	0,59	0,55	0,55	0,54	1,00	0,53	0,58	0,56	0,52	0,36	0,38	0,38	0,33	0,32
q41	0,24	0,30	0,36	0,39	0,43	0,42	0,45	0,47	0,39	0,42	0,42	0,36	0,41	0,42	0,39	0,35	0,41	0,42	0,44	0,45	0,45	0,44	0,53	1,00	0,62	0,53	0,56	0,24	0,30	0,30	0,27	0,30
q43	0,34	0,42	0,47	0,46	0,47	0,46	0,48	0,49	0,41	0,43	0,41	0,47	0,43	0,45	0,34	0,33	0,41	0,44	0,45	0,47	0,48	0,49	0,58	0,62	1,00	0,57	0,59	0,31	0,38	0,38	0,31	0,32
q44	0,40	0,48	0,43	0,48	0,51	0,46	0,51	0,52	0,47	0,48	0,50	0,50	0,47	0,54	0,43	0,45	0,47	0,50	0,50	0,57	0,58	0,55	0,56	0,53	0,57	1,00	0,68	0,40	0,45	0,41	0,39	0,40
q45	0,30	0,40	0,41	0,44	0,46	0,46	0,43	0,45	0,41	0,41	0,47	0,47	0,45	0,53	0,43	0,44	0,48	0,47	0,52	0,56	0,55	0,55	0,52	0,56	0,59	0,68	1,00	0,32	0,35	0,32	0,35	0,32
q51	0,47	0,52	0,50	0,51	0,46	0,54	0,53	0,54	0,54	0,49	0,56	0,51	0,52	0,46	0,52	0,49	0,41	0,45	0,45	0,49	0,39	0,44	0,36	0,24	0,31	0,40	0,32	1,00	0,54	0,61	0,61	0,58
q52	0,42	0,55	0,50	0,59	0,51	0,51	0,57	0,55	0,54	0,54	0,57	0,49	0,50	0,47	0,43	0,44	0,35	0,42	0,44	0,43	0,47	0,49	0,38	0,30	0,38	0,45	0,35	0,54	1,00	0,70	0,60	0,55
q53	0,49	0,59	0,46	0,55	0,45	0,50	0,56	0,59	0,49	0,49	0,55	0,55	0,51	0,46	0,41	0,47	0,33	0,46	0,41	0,39	0,42	0,45	0,38	0,30	0,38	0,41	0,32	0,61	0,70	1,00	0,70	0,70
q54	0,46	0,56	0,49	0,53	0,47	0,50	0,52	0,54	0,50	0,46	0,52	0,55	0,52	0,42	0,45	0,49	0,38	0,44	0,42	0,41	0,40	0,43	0,33	0,27	0,31	0,39	0,35	0,61	0,60	0,70	1,00	0,77
q55	0,49	0,54	0,48	0,52	0,49	0,51	0,54	0,58	0,48	0,46	0,53	0,53	0,46	0,43	0,40	0,42	0,39	0,41	0,38	0,41	0,40	0,42	0,32	0,30	0,32	0,40	0,32	0,58	0,55	0,70	0,77	1,00

[18] If the factor has a low eigenvalue, it means that it is contributing little to explain the variance f of the original variables (Kaiser criterion).
[19] Figure 22 illustrates the distribution of eigenvalues for each factor, without limiting the number of factors in the estimation. It is up to the researcher to choose how many factors to use. We followed prevailing literature, which indicates selecting factors with eigen values above 1.
[20] The matrix of factor loadings represents the correlation between each item and the common factors found. One premise of factor analysis is that it should present a simple structure of components, that is, each item should be loaded mainly by one single factor. With this, the same variable cannot contribute to the construction of different factors.

interpreting the meaning of items that aggregate in each factor.

Factor 1 aggregates items that seem to reflect personal characteristics of the supervisor evaluated and that require management's judgment about the supervision, and also items that seem to be prominent in the supervisor's support to school management at the beginning of the program.

On the other hand, Factor 2 aggregates items that are rigorously established in the program's protocols. These items also have a greater concentration of items related to stages D, C and A of the PDCA applied by the program. Our interpretation is that Factor 2 is more procedural and reminds us more of what we mentioned above as supervisor attributions.

Table 4 – Factor loadings of each item in the two common factors.

Item	Factor 1	Factor 2	Commonality
q9	0.6973	0.0339	0.5218
q10	0.7364	0.0928	0.6503
q13	0.6161	0.1989	0.5974
q14	0.6878	0.1786	0.6836
q15	0.6152	0.2493	0.6637
q16	0.6614	0.1946	0.6625
q17	0.6482	0.2388	0.7023
q18	0.6191	0.2593	0.684
q20	0.6946	0.1298	0.6304
q21	0.6183	0.1682	0.5619
q23	0.6808	0.1835	0.6788
q24	0.6230	0.1800	0.5837
q25	0.5992	0.2120	0.5888
q26	0.1796	0.6125	0.5674
q28	0.2018	0.5788	0.5457
q29	0.2004	0.5486	0.5009
q30	0.0693	0.6344	0.4712
q32	0.1738	0.6078	0.5533
q33	0.0654	0.7319	0.6096
q34	0.0452	0.7840	0.6683
q35	0.1186	0.6962	0.6189
q36	0.1142	0.7278	0.6637
q39	0.0593	0.6863	0.5338
q41	-0.1209	0.7380	0.4295
q43	-0.0065	0.6763	0.4511
q44	0.0479	0.6928	0.5305
q45	-0.1309	0.8264	0.5427
q51	0.7203	-0.0208	0.4975
q52	0.7271	-0.0138	0.5143
q53	0.8858	-0.1727	0.5919
q54	0.8793	-0.1807	0.5747
q55	0.8753	-0.1877	0.5625

Note: The highlighted cells in each column indicate the highest factor loadings in the factor, hence depicting the division of items between the factors.

Figure 25 – Factor loadings
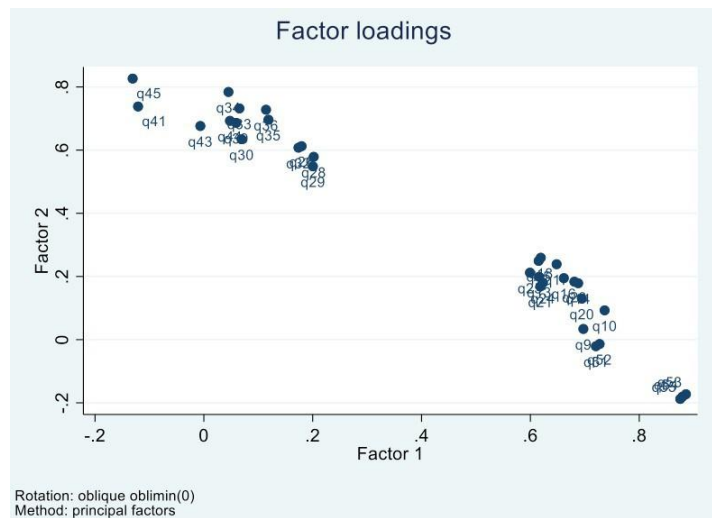
Logically, all items are answered according to the perception of the school management, so both factors measure some type of perception. However, in analyzing the content of items that aggregate in each factor, we interpret that Factor 1 encompasses items that reflect the perception of school management about personal characteristics of the supervisor, and Factor 2 reflects the perception of school management regarding the supervisor's adherence to the program's protocols.

4.2 Seeking the effect of a good supervision

With EFA, we created two factors representative of the perception of school management regarding the work of supervisors. We used this information and the result measures presented in 3.4 to determine if the quality of supervision measures can affect different result measures of schools. The econometric model we will estimate is:

$$Y_{esr} = \alpha + \beta QS_{esr} + \gamma G_e + \delta E_e + \varphi_s + \mu_r + \varepsilon_{esr} \quad (1)$$

Where:

- Y_{esr} represents the result measures tested (SMAR execution indicator, quality of management indicator or SMAR result indicator);

- QS_{esr} represents the quality of supervision indicator measured in this model by the factors;

- G_e are school manager controls: binary variable indicative of participation in Instituto Unibanco training programs, age, binary

variables indicative of at least five years working in the school and at least five years in the job function of director;

- E_e includes school control variables: binary variable indicative of priority school in program Jovem de Futuro, Inep management complexity indicator, Inep indicator of socioeconomic level;

- φ_s are fixed effect stimulators of supervisors;

- μ_r are fixed effect stimulators of regional offices; and

- ε_{esr} is an error term.

Lastly, we explain the logic of regressions presented in Tables 5, 6, 7. We first regressed the variables of interest (Factor 1 and 2) separately, and then included the manager and school control variables, respectively. This procedure allows us to observe how much each control group is corroborating the explicative level of regression (adjusted R^2). We then inserted the fixed effects per supervisor in the regression, which help us capture the variation of non-observable components of the supervisor's performance. And, lastly, we regressed all previous components with fixed effects of regional offices[21].

With this model, we sought to measure how much we can explain about school supervision effect, measured by factors extracted from the EFA, and the result measures proposed.

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[21] In section 5.1, we will discuss the results.

4.3 Connecting the survey to the Jovem de Futuro logic model (indicator of supervisor attributions)

The second analysis model we will use to evaluate the quality and effect of supervision seeks a connection of items investigated with the program's logic model.

As expressed in the logic model (INSTITUTO UNIBANCO, 2019), the performance of supervisors is based on the following attributions:

1. **They are tutors**: they complement the service training process of school managers leading them to practice the Management Circuit, helping them with doubts and difficulties that surface during application.

2. **They are advisors**: they support studying the causes and solutions to school problems and suggest paths. They are like experienced managers advising the schools.

3. **They are intermediaries between the regional office and the schools**: they circulate information and articulate school needs with the actions of the regional offices and State Department of Education.

4. **They are guardians of the Circuit implementation**: they monitor, verify and see to that the specific actions of each stage are fulfilled.

With the goal of building an indicator that comprised these four supervisor attributions, we looked at each question of the questionnaire to identify those that encompassed these dimensions. The questions selected for each attribution are listed below.

Items: Tutor

1. Pedagogical advisor clarifies doubts on matters treated in the results-based management training

2. Pedagogical advisor proposes ways to interpret educational indicators

3. Pedagogical advisor appropriates the diagnosis, problems and needs of the school

4. Pedagogical advisor guides the forming of the manager group or duo before beginning the planning

5. Pedagogical advisor discusses the state's educational targets

6. Pedagogical advisor discusses the school's educational targets

7. Pedagogical advisor provides orientation on preparing a schedule for executing actions

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Items: Advisor

1. Pedagogical advisor discusses the root causes that negatively affect the Idea

2. Pedagogical advisor provides orientation for making decisions based on evidence/proof

3. Pedagogical advisor revises the action maps prepared in the planning

4. Pedagogical advisor provides orientation about continuously registering the progress of all actions

5. Pedagogical advisor helps reformulate actions

6. Pedagogical advisor helps identify the causes of the problem

7. Pedagogical advisor anticipates potential problems

8. Pedagogical advisor proposes recommendations

9. Pedagogical advisor forms study groups

10. Pedagogical advisor listens to the parties involved in the problem being faced

11. Pedagogical advisor searches for bibliography on the topic and consults specialists

12. Pedagogical advisor analyzes past experiences or experiences from other schools

13. Pedagogical advisor encourages work in network among schools

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Items: Intermediary

1. Pedagogical advisor masters the programs and projects available in the Department

2. Pedagogical advisor discusses with the school the Department of Education's decisions and guidelines

3. Pedagogical advisor provides feedback on requests submitted to the regional offices

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Items: Intermediary

1. pedagogical advisor assists in the utilization of the project management system (SGP) as a management tool

2. Pedagogical advisor monitors if the action plan items are being executed

3. Pedagogical advisor monitors if the action plan items are being registered in the SGP

4. Pedagogical advisor provides orientation on disseminating quarterly results in relation to the annual target

5. Pedagogical advisor assists in the identification of good practices

6. Pedagogical advisor assists in the evaluation of task execution and delivery of products

7. Pedagogical advisor analyzes structural indicators with ease

8. Pedagogical advisor assists in the analysis of execution data that will be used in the route correction

---

Each one of these items was answered on a scale from 1 to 4, where 4 represents the best performance in each item. Initially, we built four separate indicators: one for each attribution. For each one of the sets of items above, we calculated the average of the responses for each observation. After that, we ran the following specification:

$$Y_{esr} = \alpha + \beta_{1s} \cdot tutor_{esr} + \beta_{2i}\ advisor_{esr} + \beta_{3i} \cdot intermediary_{esr} + \beta_{4i} \cdot guardian_{esr} + \gamma G_e + \delta E_e + \varphi_s + \mu_r + \varepsilon_{esr}$$

Where:

- Y_{esr} once again represents the result measures tested (SMAR execution indicator, management quality indicator or SMAR results indicator);

- The $tutor_{esr}$, $advisor_{esr}$, $intermediary_{esr}$ and $guardian_{esr}$ variables refer to the attribution indicators for each observation (which construction was described above);

- G_e includes school manager control variables, just like the previous model: binary variable indicative of participation in Instituto Unibanco training, binary variables indicative of at least five years working in the school and at least five years in the function of director;

- E_e includes school control variables just like the previous model: binary variable indicative of priority school in program Jovem de Futuro, Inep socioeconomic level indicator, Inep management complexity indicator;

- φ_s are the fixed effect stimulators of supervisors;

- μ_s are the fixed effect stimulators of regional offices; and

- ε_{esr} is an error term.

This specification was first run in the states separately (ES and RN) and then for all observations stacked in order to obtain greater statistical power. When running this specification, we are analyzing the partial effects of each attribution indicator of supervisors (sanitized for the correlations between attributions). With this, we obtained coefficients for indicators with no statistical significance, which result makes sense if we consider that a supervisor needs to have characteristics of the four competencies to do a good job. This analysis will be

deepened in the section on results.

That said, in the next step we once again base ourselves on each of the sections described above and calculate an average indicator for the four attributions. This indicator is the average (for each observation) of all the items selected to make up the attributions (presented individually in the charts above). We call this result an "attribution indicator", as it encompasses the four competencies defined by the logic model as supervisor desirable attributions.

For inference, we utilized a methodology analogous to the one used with the factors described in the previous section. We ran the following specification: :

$$Y_{esr} = \alpha + \beta_{1s} \cdot attrib_{esr} + \gamma G_e + \delta E_e + \varphi_s + \mu_r + \varepsilon_{esr}$$

where the variables have the same meaning than the model described above, except for the $attrib_{esr}$ variable which refers to our new variable defined as "attribution" for each observation of the sample.

Lastly, we followed the same logic of regressions with the factors extracted from the questionnaires, with the insertion of regressors by control groups to observe how each one is corroborating the regression's explicative level (adjusted R^2). However, for simplification, Tables 9, 10, 11 already show the results of the completed regressions with all the regressors (including the manager- and school-control variables). For each complete group of regressors, we presented the first regression without any fixed effect, and then with the fixed effects per supervisor and, lastly, we regressed all the previous components only with the regional office fixed effects.

5. Results

As presented in detail in section 3, the result measurements we utilized in this analysis were: SMAR execution indicator, management quality indicator (MADEIRA; MELONI, 2018) SMAR result indicator.

In a general analysis of the logic model, our hypothesis about the relationship of the supervisor's performance in the program's result is that, initially, a good job of supervision would impact implementation of the Circuit. In a second moment, we would see an improvement in management quality and, lastly, the effect of the supervision performance could reflect on the school's functioning. As such, we conducted our analyses following this logic and present the results of this analysis below.

5.1 Exploratory factor analysis

In section 4, we explained the exploratory factor analysis process and the two factors (constructs) extracted from the process. We interpreted these two factors in the following manner: Factor 1 encompasses items that reflect school management's perception regarding personal characteristics of the supervisor that attends the school; Factor 2 reflects management's perception regarding the supervisor's adherence to the program's protocols. With these interpretations of factors in mind, we will analyze the results of the regressions proposed above.

Regarding the effect of the quality of the visit on the SMAR execution indicator (implementation of the Circuit), let's take a look at Table 5. Explaining once again the constructs that measure the quality of the supervisor's visit to the school, for Factor 1 (school management's perception regarding personal characteristics of the supervisor), we have a negative and significant correlation with the indicator in ES; however, when we include the fixed effect (EF) of the supervisor, this significance is lost. In other words, the result may be coming from characteristics not observed in the supervisor. In comparison, in RN, there exists a positive correlation, but statistically not significant[22].

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[22] We considered the correlation of this factor with the variable of interest not significant because it only has statistical significance in model 7, which is the simplest, without controls and without fixed effects. As such, it is clear that the partial effect of factor 1 is not strong when cleaned from its interactions with other control variables or characteristics not observable of supervisors.

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Table 5 – Effect of the quality of the visit: SMAR execution indicator.

VARIABLES	(1) ES	(2) ES	(3) ES	(4) ES	(5) ES	(6) ES	(7) RN	(8) RN	(9) RN	(10) RN	(11) RN	(12) RN
F1: Personal characteristics	-0.016*	-0.017*	-0.016*	-0.009	-0.008	-0.011	0.062*	0.046	0.044	0.014	0.002	0.022
	[0.008]	[0.008]	[0.008]	[0.010]	[0.010]	[0.008]	[0.033]	[0.034]	[0.035]	[0.049]	[0.052]	[0.034]
F2: Adherence to the program	0.026***	0.026**	0.026***	0.027*	0.027*	0.018	0.052*	0.073**	0.075**	0.042	0.124**	0.128***
	[0.010]	[0.010]	[0.010]	[0.014]	[0.014]	[0.012]	[0.027]	[0.030]	[0.031]	[0.046]	[0.047]	[0.038]
Manager: participated in IU training		0.055*	0.051	0.060	0.055	0.042		-0.215	-0.212	-0.254	-0.928***	-0.858***
		[0.031]	[0.035]	[0.040]	[0.045]	[0.036]		[0.227]	[0.235]	[0.342]	[0.200]	[0.207]
Manager: age		0.000	-0.000	-0.000	-0.000	-0.000		-0.008**	-0.008**	-0.005	-0.003	-0.003
		[0.001]	[0.001]	[0.001]	[0.001]	[0.001]		[0.003]	[0.003]	[0.004]	[0.004]	[0.003]
Manager: at least 5 years in the school		-0.015	-0.017	-0.026*	-0.025*	-0.019*		-0.058	-0.056	-0.072	-0.155**	-0.123*
		[0.011]	[0.010]	[0.013]	[0.013]	[0.010]		[0.069]	[0.070]	[0.082]	[0.074]	[0.069]
Manager: at least 5 years in the function		0.001	0.003	0.005	0.005	0.008		0.045	0.037	-0.076	0.039	0.062
		[0.016]	[0.016]	[0.018]	[0.018]	[0.014]		[0.074]	[0.075]	[0.094]	[0.129]	[0.091]
Priority school			-0.030*	-0.019	-0.019	-0.024			0.031	0.046	0.016	0.014
			[0.018]	[0.029]	[0.030]	[0.020]			[0.076]	[0.096]	[0.141]	[0.119]
Management complexity index			-0.007	-0.010	-0.010	-0.006			-0.012	-0.012	-0.049	-0.035
			[0.006]	[0.006]	[0.007]	[0.005]			[0.031]	[0.034]	[0.043]	[0.035]
Socioeconomic level index					0.002	0.001					0.022*	0.006
					[0.003]	[0.002]					[0.012]	[0.010]
Observations	172	172	172	172	171	171	136	136	136	136	99	99
Adjusted R-squared	0.023	0.031	0.060	0.262	0.259	0.144	0.149	0.176	0.166	0.317	0.453	0.370
Constant	S	S	S	S	S	S	S	S	S	S	S	S
Manager controls	N	S	S	S	S	S	N	S	S	S	S	S
School controls	N	N	S	S	S	S	N	N	S	S	S	S
Supervisor fixed effect	N	N	N	S	S	N	N	N	N	S	S	N
Regional office fixed effect	N	N	N	N	N	S	N	N	N	N	N	S

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.10

Table 6 – Effect of the quality of the visit: management quality indicator

VARIABLES	(1) ES	(2) ES	(3) ES	(4) ES	(5) ES	(6) ES	(7) RN	(8) RN	(9) RN	(10) RN	(11) RN	(12) RN
F1: Personal characteristics	-0.094	-0.097	-0.093	-0.034	-0.045	-0.075	-0.009	-0.013	-0.004	0.138	0.081	0.043
	[0.082]	[0.087]	[0.086]	[0.101]	[0.104]	[0.086]	[0.063]	[0.063]	[0.067]	[0.082]	[0.076]	[0.065]
F2: Adherence to the program	0.188*	0.195*	0.193*	0.128	0.135	0.173	0.073	0.077	0.068	-0.002	-0.024	0.017
	[0.099]	[0.105]	[0.104]	[0.141]	[0.142]	[0.108]	[0.051]	[0.053]	[0.057]	[0.078]	[0.084]	[0.070]
Manager: participated in IU training		-0.069	-0.079	-0.015	0.027	-0.027		-0.571**	-0.656***	-0.620**	-0.672**	-0.752***
		[0.128]	[0.133]	[0.237]	[0.245]	[0.108]		[0.215]	[0.180]	[0.299]	[0.260]	[0.261]
Manager: age		-0.010**	-0.010**	-0.010	-0.011	-0.011**		-0.000	0.001	0.003	0.004	0.004
		[0.005]	[0.005]	[0.007]	[0.007]	[0.005]		[0.006]	[0.007]	[0.007]	[0.011]	[0.010]
Manager: at least 5 years in the school		0.117	0.114	0.004	0.001	0.090		0.068	0.080	-0.090	-0.029	-0.049
		[0.100]	[0.104]	[0.143]	[0.146]	[0.098]		[0.141]	[0.139]	[0.141]	[0.131]	[0.124]
Manager: at least 5 years in the function		0.169*	0.167*	0.313**	0.311**	0.238**		0.106	0.120	0.056	-0.261	-0.146
		[0.085]	[0.087]	[0.139]	[0.141]	[0.097]		[0.132]	[0.141]	[0.172]	[0.230]	[0.159]
Priority school			-0.098	-0.012	0.027	0.018			0.113	0.182	0.188	0.123
			[0.099]	[0.183]	[0.197]	[0.123]			[0.127]	[0.120]	[0.116]	[0.147]
Management complexity index			0.012	0.013	0.011	0.012			0.118**	0.124**	0.075	0.062
			[0.032]	[0.047]	[0.047]	[0.034]			[0.045]	[0.053]	[0.083]	[0.053]
Socioeconomic level index					0.014	0.008					-0.002	-0.009
					[0.025]	[0.019]					[0.022]	[0.014]
Observations	171	171	171	171	170	170	136	136	136	136	99	99
Adjusted R-squared	0.021	0.038	0.031	0.020	0.009	0.085	0.009	0.005	0.054	0.114	-0.032	-0.058
Constant	S	S	S	S	S	S	S	S	S	S	S	S
Manager controls	N	S	S	S	S	S	N	S	S	S	S	S
School controls	N	N	S	S	S	S	N	N	S	S	S	S
Supervisor fixed effect	N	N	N	S	S	N	N	N	N	S	S	N
Regional office fixed effect	N	N	N	N	N	S	N	N	N	N	N	S

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.10

Table 7 – Effect of the quality of the visit: SMAR result indicator

VARIABLES	(1) ES	(2) ES	(3) ES	(4) ES	(5) ES	(6) ES	(7) RN	(8) RN	(9) RN	(10) RN	(11) RN	(12) RN
F1: Personal characteristics	-0.003	-0.001	0.002	0.004	0.007	0.011	-0.011	-0.009	-0.009	-0.008	-0.020	-0.029
	[0.014]	[0.014]	[0.013]	[0.018]	[0.019]	[0.014]	[0.012]	[0.012]	[0.013]	[0.016]	[0.024]	[0.018]
F2: Adherence to the program	0.012	0.008	0.007	-0.009	-0.011	-0.003	0.012	0.011	0.011	-0.000	-0.009	0.013
	[0.014]	[0.015]	[0.014]	[0.017]	[0.017]	[0.014]	[0.013]	[0.014]	[0.014]	[0.021]	[0.028]	[0.023]
Manager: participated in IU training		0.041	0.033	0.047	0.037	0.034		-0.084	-0.102*	-0.003	0.195	0.096
		[0.048]	[0.047]	[0.062]	[0.063]	[0.043]		[0.052]	[0.058]	[0.092]	[0.124]	[0.086]
Manager: age		0.001	0.001	0.001	0.001	0.001		0.002	0.002*	0.002	0.003	0.001
		[0.001]	[0.001]	[0.001]	[0.001]	[0.001]		[0.001]	[0.001]	[0.002]	[0.003]	[0.002]
Manager: at least 5 years in the school		0.039***	0.035***	0.024	0.025	0.027**		-0.005	-0.001	0.017	0.070*	0.037
		[0.013]	[0.013]	[0.016]	[0.016]	[0.012]		[0.018]	[0.018]	[0.025]	[0.035]	[0.032]
Manager: at least 5 years in the function		-0.062***	-0.061***	-0.062***	-0.062***	-0.057***		-0.062**	-0.064**	-0.039	-0.077	-0.044
		[0.021]	[0.019]	[0.021]	[0.021]	[0.014]		[0.029]	[0.030]	[0.030]	[0.049]	[0.042]
Priority school			-0.066***	-0.050	-0.061*	-0.048**			0.043	0.064*	0.125*	0.097*
			[0.022]	[0.030]	[0.033]	[0.023]			[0.030]	[0.037]	[0.064]	[0.051]
Management complexity index			-0.003	-0.000	0.000	-0.002			0.020**	0.021	0.025	0.018
			[0.005]	[0.006]	[0.006]	[0.005]			[0.009]	[0.013]	[0.020]	[0.012]
Socioeconomic level index					-0.004	-0.003					-0.001	0.000
					[0.004]	[0.003]					[0.007]	[0.004]
Observations	172	172	172	172	171	171	136	136	136	136	99	99
Adjusted R-squared	-0.006	0.053	0.110	0.394	0.402	0.410	-0.009	0.006	0.033	0.137	0.180	0.044
Constant	S	S	S	S	S	S	S	S	S	S	S	S
Manager controls	N	S	S	S	S	S	N	S	S	S	S	S
School controls	N	N	S	S	S	S	N	N	S	S	S	S
Supervisor fixed effect	N	N	N	S	S	N	N	N	N	S	S	N
Regional office fixed effect	N	N	N	N	N	S	N	N	N	N	N	S

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.10

For Factor 2, management's perception regarding the supervisor's adherence to the program's protocols, we see a positive and significant correlation in both states studied, but of greater magnitude in RN. It is important to point out that even in specifications (4) and (5) for ES, with all the controls and supervision fixed effects, this statistical significance continues. This is a good sign of the strong relationship of this indicator with the execution variable, even when cleaned of all other interactions measured herein and observed and not observed. For RN, similarly, (11) and (13) are the specifications with supervision and regional office fixed effects, and both continue with statistical significance in the relationship of Factor 2 with the task execution variable. In this case, the magnitude of effect is even greater with these fixed effects, suggesting that characteristics not observable of the supervisor, and, consequently, of the regional office, are contributing to the factor's relationship with execution.

A possible interpretation of these results is that, if the factors in fact measure perceptions about the personal characteristics of the supervisor versus perceptions regarding adherence to the program's protocols, it is the procedures stipulated by JF that matter for executing the tasks planned throughout the Management Circuit, while orientations linked to personal characteristics have no effect in the case of RN, or can even hinder the execution of tasks in the case of ES.

The personal characteristics of supervisors in ES tend to be more bureaucratic and, therefore, may hinder the flow of the Circuit, in view that in this state the parties involved already execute 96% of the tasks and are better prepared for more-proficient levels of management. In ES, at the time of the survey, the program was in its third year of implementation. The circuit running more time, in this case, may mean greater proficiency in planning and task-execution techniques.

On the other hand, in RN, personal characteristics do not affect execution. We formulated two potential mechanisms to explain why this occurs: 1) characteristics may not yet affect the Circuit, as it has not yet gained maturity, it has at least one year less implementation time than ES and is not fully running, therefore, the people involved do not yet have proficiency to reach the implementation of tasks; 2) the supervision figure in RN was created for program Jovem de Futuro, hence, there may be less competence on the part of supervisors and management group in their new functions. In addition, interaction between supervisor and manager may be less fluid and, consequently, more conflict based. These hypotheses are corroborated

by the evaluations of RN managers always being less positive than the evaluations of ES managers.

For both states, the perception about the supervisor's adherence to the program's protocol has a positive correlation with the implementation of the Circuit, that is, following the protocol in fact has an effect on the execution indicator. The magnitude of the RN coefficients is bigger, and this may be due to less maturity, with more space for growth: ES executes roughly 97% of planned actions and tasks, while RN executes 78%.

Given the magnitude of the effect of the perception factor of the supervisor's adherence to the program protocol on the execution of tasks being greater in RN than ES, it is possible that, the less appropriated the state is of the Management Circuit (in this case, RN), the greater the influence of procedural orientations of the supervision figure. In this sense, another hypothesis is that, the more the Circuit is run over time, more internalized it becomes in the state's *modus operandi* (in this case, ES) as it is supposed to be, therefore, less is the need (and influence) of recommendations about the cycle's execution.

In Table 6, we analyze the effect of the quality of visits on the management quality indicator[23]. In Factor 1, management's perception about the supervisor's personal characteristics, we see a negative but statistically-insignificant correlation for ES, and the coefficients for RN oscillate between positive and negative, but also are equally insignificant.

For Factor 2, management's perception about the supervisor's adherence to the program's protocols, we have a positive correlation for ES but with statistical significance in only a few of the specifications, that is, (1) to (3), which include the manager and school controls. When we include the fixed effect of supervisors (estimation 4), we lose statistical significance. This suggests that characteristics not observable of supervisors are cleaning this effect. Once again, in RN we have positive and negative coefficients, but all with no statistical significance.

In view that these correlations with the quality of management indicator are weak and tend towards null, our initial interpretation would be that the supervisor's performance in the perception of managers, and no level (personal characteristics or adherence to protocol), is being capable of affecting management quality. In ES, where the Madeira and Meloni (2018) instrument had a positive impact on schools treated by the program, if we take into consideration specifications (1) to (3), we have some

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[23] By Madeira and Meloni (2018): measures the quality of school manager practices. This practice can be perfected through experience in the Management Circuit and is necessary for the program's evolution, especially to achieve results in the school functioning.

evidence of correlation of Factor 2 with management quality. Even so, we cannot forget that inserting supervision fixed effects diminishes this effect to near zero (statistically). That is, in ES, given the program's maturity, supervision may not be reaching (or being close to reaching) the level of affecting management practices. However, characteristics not observable of the supervisor are still important for determining this relationship.

In ES, the correlation between the protocol adherence factor and the quality of management indicator suggests: if it is the execution of the Circuit, influenced by adherence to the program's protocols, that leads to an improvement in management competencies, first of all we see one of the main pillars of the program – "learn from practice" – in action. Following Theory of Change hypotheses, after achieving proficiency in executing the Circuit, the manager needs greater maturity to develop more-complex management practices. As such, it is in the state with greater maturity in running the Circuit (ES) that we should see an improvement in management quality. States less appropriated of the Circuit, like RN, should not yet be capable of reaching this second level as a result of the quality of technical visits. This is precisely what we interpreted from this result.

In view that the personal characteristics factor already was not important for executing the Circuit, they shouldn't be for the quality of management indicator. And this is what we see here.

Lastly, Table 7 presents estimations of the effect of the quality of visits on the SMAR result indicator (*proxy* for school functioning). For both factors and states, all correlations estimated do not possess statistical significance, leading us to believe that this relationship is truly null.

As already presented, following the program's logic model, the next reverberation of effects would occur in the level of school activities, which we call school functioning (partially measured by the SMAR results indicator). According to the logic model, it would be necessary for there to be a consolidation in the improvement of school management practices to identify an effect of the quality of visits on school functioning.

In this case, the results suggest that the technical visits of supervisors are not yet capable of reaching this level in neither state, given the null results of these estimations. A hypothesis for future surveys is whether in fact ES will obtain these effects before RN, in view that ES seems to have already reached the level of management quality improvement via quality of visits.

5.2 Connecting the survey to the Jovem de Futuro logic model (supervisor attributions indicator)

As explained previously, the attribution indicators were initially built based on items from the questionnaire that referred to each attribution designed in the Jovem deFuturo logic model. In view that they are correlated with each other, we opted to use a single attribution indicator.

We concluded that trying to understand the effects of these attributions separately is insufficient. To be effective (in the sense of having result), supervisors need the four dimensions interacting during their work. In other words, when we try to determine the effect of one attribution on its own, we do not see a significant correlation with any of the result variables tested. However, when we use a joint indicator of the four attributions, we see evidence of positive and significant correlation with some of the results measures. Another way to explain this is to think that, for a supervisor to adequately exert its function of tutor, some advisor competencies are necessary; likewise, to adequately exert the function of advisor, the supervisor needs intermediary and guardian competencies. Corroborating this conclusion, we have Table 8 of correlations between attribution indicators. As we can see, all attributions are highly correlated to one another.

Table 8 – Correlation of attribution indicators

	Tutor	Advisor	Intermediary	Guardian
Tutor	1	0.818	0.830	0.783
Advisor	0.818	1	0.806	0.903
Intermediary	0.830	0.806	1	0.802
Guardian	0.783	0.903	0.802	1

Based on the numbers presented in Table 9, our interpretation is that in the state of ES, where the program is already more mature and the plan's tasks are executed at a high level of 96%, even if the supervisors exert their attributions well, there is little space to affect this indicator and, therefore, we do not see an effect on the Execution indicator. In other words, if this indicator reflects the circuit working, the supervisor's performance has little

work room in this phase. On the other hand, we see the opposite in the state of RN, where the indicator of attributions has a positive and significant correlation with the Execution indicator. If we trained a supervisor to reach the maximum in the attributions indicator, the percent variation obtained in the SMAR execution would be 28% in RN, while an ES this value is only 1%. We found this information in Figure 25.

Table 9 – Effect of the quality of the visit: SMAR execution indicator

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ES	ES	ES	RN	RN	RN	ALL	ALL	ALL
Attribution	0.018	0.032*	0.010	0.214***	0.215**	0.258***	0.144***	0.078*	0.094**
	[0.012]	[0.016]	[0.022]	[0.045]	[0.085]	[0.058]	[0.036]	[0.044]	[0.040]
Manager: participated in IU training	0.046	0.054	0.042	-0.532***	-0.895***	-0.844***	-0.044	-0.026	-0.031
	[0.036]	[0.044]	[0.038]	[0.097]	[0.195]	[0.134]	[0.077]	[0.112]	[0.076]
Manager: age	0.000	-0.000	-0.000	-0.007*	-0.003	-0.003	-0.004**	-0.000	-0.001
	[0.001]	[0.001]	[0.001]	[0.004]	[0.004]	[0.003]	[0.002]	[0.002]	[0.001]
Manager: at least 5 years in the school	-0.015	-0.023*	-0.018	-0.082	-0.164**	-0.127**	-0.057**	-0.040	-0.025
	[0.010]	[0.013]	[0.012]	[0.073]	[0.079]	[0.045]	[0.023]	[0.033]	[0.023]
Manager: at least 5 years in the function	0.001	0.006	0.008	0.095	0.044	0.064	0.085**	0.017	0.022
	[0.016]	[0.018]	[0.013]	[0.070]	[0.127]	[0.087]	[0.033]	[0.037]	[0.033]
Priority school	-0.033*	-0.018	-0.025	-0.001	0.030	0.025	-0.032	0.006	-0.016
	[0.018]	[0.030]	[0.014]	[0.090]	[0.132]	[0.161]	[0.030]	[0.048]	[0.050]
Management complexity index	-0.007	-0.011	-0.006	-0.025	-0.044	-0.033	-0.016	-0.021	-0.013
	[0.006]	[0.007]	[0.006]	[0.033]	[0.041]	[0.026]	[0.012]	[0.013]	[0.010]
Socioeconomic level index	0.001	0.001	0.001	-0.004	0.020	0.005	0.006	0.009	0.002
	[0.003]	[0.003]	[0.002]	[0.007]	[0.013]	[0.010]	[0.004]	[0.006]	[0.005]
Observations	171	171	171	99	99	99	270	270	270
Adjusted R-squared	0.044	0.254	0.139	0.217	0.443	0.374	0.239	0.480	0.427
Constant	S	S	S	S	S	S	S	S	S
Manager controls	S	S	S	S	S	S	S	S	S
School controls	S	S	S	S	S	S	S	S	S
Supervisor fixed effect	N	S	N	N	S	N	N	S	N
Regional office fixed effect	N	N	S	N	N	S	N	N	S

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.10

Table 10 – Effect of the quality of the visit: quality of management indicator

VARIABLES	(1) ES	(2) ES	(3) ES	(4) RN	(5) RN	(6) RN	(7) ALL	(8) ALL	(9) ALL
Attribution	0.168*	0.176	0.180**	0.052	0.079	0.107	0.143**	0.118	0.124*
	[0.094]	[0.152]	[0.070]	[0.075]	[0.094]	[0.119]	[0.057]	[0.096]	[0.067]
Manager: participated in IU training	-0.043	0.019	-0.034	-0.638***	-0.708***	-0.801***	-0.194	-0.115	-0.122
	[0.126]	[0.241]	[0.093]	[0.142]	[0.220]	[0.252]	[0.129]	[0.215]	[0.118]
Manager: age	-0.009*	-0.010	-0.010*	0.002	0.003	0.004	-0.006	-0.003	-0.003
	[0.005]	[0.007]	[0.005]	[0.007]	[0.011]	[0.008]	[0.004]	[0.006]	[0.005]
Manager: at least 5 years in the school	0.116	0.010	0.098	0.025	-0.018	-0.050	0.035	0.043	0.076
	[0.099]	[0.141]	[0.116]	[0.132]	[0.137]	[0.100]	[0.076]	[0.110]	[0.096]
Manager: at least 5 years in the function	0.169*	0.315**	0.240*	-0.095	-0.277	-0.151	0.188**	0.160	0.133
	[0.086]	[0.141]	[0.108]	[0.110]	[0.231]	[0.155]	[0.078]	[0.132]	[0.105]
Priority school	-0.109	0.025	0.003	0.166	0.195*	0.131	-0.036	0.058	0.020
	[0.096]	[0.190]	[0.082]	[0.117]	[0.106]	[0.115]	[0.080]	[0.129]	[0.065]
Management complexity index	0.014	0.009	0.009	0.069	0.064	0.058	0.026	0.034	0.028
	[0.033]	[0.047]	[0.051]	[0.046]	[0.081]	[0.065]	[0.027]	[0.040]	[0.040]
Socioeconomic level index	-0.026	0.013	0.006	-0.022**	-0.001	-0.008	0.001	0.009	-0.001
	[0.016]	[0.025]	[0.025]	[0.009]	[0.023]	[0.014]	[0.006]	[0.016]	[0.012]
Observations	170	170	170	99	99	99	269	269	269
Adjusted R-squared	0.029	0.017	0.084	0.019	-0.028	-0.043	0.035	0.044	0.085
Constant	S	S	S	S	S	S	S	S	S
Manager controls	S	S	S	S	S	S	S	S	S
School controls	S	S	S	S	S	S	S	S	S
Supervisor fixed effect	N	S	N	N	S	N	N	S	N
Regional office fixed effect	N	N	S	N	N	S	N	N	S

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.10

The quality of management measure, presented in table 10, measures an intermediary step between the Circuit running and generating result: when the manager demonstrates greater understanding and development in management practices. The positive and significant correlation we found between the attribution indicator and this result measurement for ES suggests that the supervisor's performance is correlated with the path for result. C and this is evident in this state but not in Rio Grande do Norte, once again suggesting an effect due to greater maturity of the program in ES. Doing the same analysis done in the execution indicator, the effect for a supervisor that reaches the maximum level of attribution is small, only 2% for ES and 1% for RN (Table 12).

Table 11 – Effect of the quality of the visit: SMAR result indicator

VARIABLES	(1) ES	(2) ES	(3) ES	(4) RN	(5) RN	(6) RN	(7) ALL	(8) ALL	(9) ALL
Attribution	0.015	-0.008	0.012	0.003	-0.037	-0.011	0.027**	-0.016	0.003
	[0.013]	[0.014]	[0.015]	[0.020]	[0.056]	[0.043]	[0.012]	[0.024]	[0.019]
Manager: participated in IU training	0.041	0.037	0.034	-0.002	0.180	0.097	0.007	0.055	0.044
	[0.045]	[0.065]	[0.049]	[0.037]	[0.127]	[0.093]	[0.045]	[0.062]	[0.045]
Manager: age	0.001	0.001	0.001	0.003*	0.003	0.001	0.001	0.002*	0.001
	[0.001]	[0.001]	[0.001]	[0.002]	[0.003]	[0.002]	[0.001]	[0.001]	[0.001]
Manager: at least 5 years in the school	0.035***	0.024	0.027**	0.017	0.066**	0.032	0.005	0.032**	0.025**
	[0.012]	[0.016]	[0.012]	[0.023]	[0.032]	[0.027]	[0.014]	[0.014]	[0.011]
Manager: at least 5 years in the function	-0.060***	-0.062***	-0.057***	-0.072*	-0.071	-0.037	-0.029	-0.067***	-0.051***
	[0.018]	[0.021]	[0.012]	[0.039]	[0.047]	[0.046]	[0.019]	[0.020]	[0.011]
Priority school	-0.075***	-0.061*	-0.047	0.050	0.120*	0.089	-0.033	0.003	-0.005
	[0.020]	[0.033]	[0.031]	[0.039]	[0.061]	[0.063]	[0.022]	[0.034]	[0.035]
Management complexity index	-0.002	0.000	-0.002	0.018	0.027	0.021	0.001	0.008	0.003
	[0.005]	[0.006]	[0.006]	[0.012]	[0.019]	[0.014]	[0.006]	[0.007]	[0.006]
Socioeconomic level index	-0.008***	-0.004	-0.002	0.003	-0.001	0.000	0.007***	0.000	0.000
	[0.003]	[0.003]	[0.003]	[0.003]	[0.006]	[0.004]	[0.002]	[0.003]	[0.003]
Observations	171	171	171	99	99	99	270	270	270
Adjusted R-squared	0.162	0.405	0.412	0.021	0.178	0.027	0.064	0.348	0.327
Constant	S	S	S	S	S	S	S	S	S
Manager controls	S	S	S	S	S	S	S	S	S
School controls	S	S	S	S	S	S	S	S	S
Supervisor fixed effect	N	S	N	N	S	N	N	S	N
Regional office fixed effect	N	N	S	N	N	S	N	N	S

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.10

Lastly, Table 11 shows that in either of the two states is there a statistically significant relationship of the attribution indicator with the SMAR result indicator, suggesting that both are not yet translating execution and management in result through the

Supervisor's work. It is expected that with time and the continued application of PDCA in schools, the effect of supervision can eventually reach the result indicator.

Table 12 – Analysis of coefficients

Analysis of coefficients									
	Result:			Result:			Result:		
	SMAR execution			Management average			SMAR Result		
	ES	RN	ALL	ES	RN	ALL	ES	RN	ALL
Y_bar	0.97	0.78	0.87	4.25	3.92	4.09	0.74	0.64	0.69
Attribution indicator									
Beta	0.018	0.214***	0.078*	0.168*	0.052	0.143**	-0.008	0.003	-0.016
Avg. attribution ind.	3.53	3.16	3.34	3.53	3.16	3.34	3.53	3.16	3.34
Proportional beta	0.01	0.18	0.05	0.08	0.04	0.09	0.00	0.00	-0.01
How much it varies in the result?	0.98	0.96	0.92	4.33	3.97	4.18	0.73	0.64	0.68
Percent variation	1%	23%	6%	2%	1%	2%	-1%	0%	-2%

Note: ***$p<0.01$; **$p<0.05$; *$p<0.10$.

6. Final considerations

We present the results of the field survey done in the states of ES and RN. The objective was to measure the effect of technical visits made by supervisors of program Jovem deFuturo. Overall, we observed in the descriptive data that implementation of the program in RN is less mature and that the supervisors seem to be less appropriated of the procedures than in ES.

The estimations tested the correlations of the effect of supervisor technical visit with three result variables. Conceptually, these variables are linked to the maturity of JF, as each one measures a moment of development of the program and of school management.

We first tested the effect of the quality of supervision visit in the execution indicator, result variable that measures the initial moment of the Theory of Change, in which the school manager is learning how to run the Management Circuit. In this moment we saw that, in ES, adherence to protocols strongly correlates with the execution of tasks; however, personal characteristics of the supervisor may even influence negatively this indicator. The attributions indicator shows us that there is little space for these competencies to affect execution. If we trained a supervisor to reach the best evaluation, even so the effect would be very small, a 1% improvement in the execution indicator. One reason for this is that ES already executes 97% of the Action Plan's tasks. In RN, there exists a strong correlation between adherence to protocol and the execution of tasks, and of greater magnitude than in ES. This makes sense because RN has an execution level of tasks well below that of ES, only 70%. The correlation of personal characteristics of supervisors with execution is weak or null. However, the indicator of attributions shows us a positive and significant correlation with execution, and the magnitude of the percentage gain of training a supervisor to reach the maximum level of attributions is quite high, 28%. The next moment, according to the Theory of Change, would be to observe the learning and development of more-complex management practices.

We then tested the effect of the quality of the supervision visit on the management quality indicator. In this moment we saw that ES, the state with greater maturity in the program, was the only one in which we detected a positive and statistically significant effect of supervision visits in the quality of management, both through adherence to protocols as well as through the indicator of attributions. The coefficients of adherence to protocols are higher, and we noted that non-observable characteristics of supervisors can overlap this effect. However, we also saw the effect of the attributions indicator on management quality, reinforcing that adhesion to protocols and desirable competencies of supervision are possible influence paths in management.

In RN, the state with less maturity, we did not observe any correlation between technical visits and attributions of the supervisor with this indicator. This result is explained by the less maturity of the state's schools in the program and also by the inferior evaluation of school managers regarding the performance of supervisors, as seen in the questionnaires.

Lastly, the last instance of effect desired is that the program, through supervision, is capable of achieving results in the schools functioning, that is, services effectively delivered by the school. This is measured by the SMAR result indicator and in estimations of the effect of the quality of supervision visits on this indicator. For this level of effect, we did not observe any statistically significant result in ES or RN. Our hypothesis is that the learning exerted in practice by program Jovem de Futuro is still in development and the next state to achieve this level should be ES.

The results presented herein open the door for future surveys, for example, maintaining the monitoring of states and observing what will be the effect of supervision visits after another cycle of the Management Circuit. Another interesting hypothesis to test would be on the mechanisms by which we observe the effect of personal characteristics and adherence to the program in the execution indicator. For such, we could investigate more in depth the personal characteristics of supervisors to try and identify which ones can or don't affect the program.

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Annexes

Presented below are the questionnaire items selected by the Exploratory Factor Analysis for Factor 1 and Factor 2, respectively:

Table 13: Items selected for Factor 1

Item	Text
9	Supervisor has technical knowledge of the education area
10	Pedagogical supervisor knows the dynamics of the Management Circuit
13	Supervisor masters the programs and projects available in the Department
14	Supervisor clarifies doubts on matters addressed in the results-based management training programs
15	Supervisor proposes ways for interpreting educational indicators
16	Supervisor discusses the root causes that negatively affect the IDEBES
17	Supervisor provides orientation for making decisions based on evidence/proof
18	Supervisor assists in the utilization of the project management system (SGP) as a management tool
20	Supervisor appropriates the diagnostic, problems and needs of the school
21	Supervisor guides the forming of the management group or duo before beginning the planning
23	Supervisor discusses the school's educational targets
24	Supervisor provides orientation on preparing a schedule for executing actions
25	Supervisor discusses the Department of Education's decisions and guidelines with the school
51	Supervisor is available for contact in intervals between in-person visits
52	Supervisor encourages the manager to involve other people in the action plan
53	Supervisor supports the manager to assume the role of Management Circuit leader
54	Supervisor recognizes the work that the manager does in the school
55	Supervisor establishes a relationship of trust with the manager

Table 14: Items selected for Factor 2

Item	Text
26	Supervisor revises the action maps prepared in the Planning
28	Supervisor monitors if the action plan items are being executed
29	Supervisor monitors if the action plan items are being registered in the project management system (SGP)
30	Supervisor provides feedback on requests submitted to the regional offices
32	Supervisor provides orientation on disseminating quarterly results in relation to the annual target
33	Supervisor assists in the identification of good practices
34	Supervisor assists in the evaluation of task execution and delivery of products
35	Supervisor analyzes structural indicators with ease
36	Supervisor assists in the analysis of execution data that will be used in the Route Correction
39	Anticipates potential problems
41	Forms study groups
42	Listens to the parties involved in the problem being faced
44	Analyzes past experiences or experiences from other schools
45	Encourages work in network among schools