

The Management of Knowledge in the School Context and the continued Training of Teachers in Service

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Abstract—The present work analyses the administration within a school organization from a pedagogical perspective, understanding that pedagogical coordination acts with the management, being responsible for coordinating the progress of the work in the organization, ensuring the articulation of interpersonal relations, the conditions for the personal and professional development of the people of the school. The research was carried out in one school maintained by Brazil's federal government, located in the city of Rio de Janeiro that is attended exclusively by students in the initial years of fundamental education. As instruments of data collection, a structured interview and a semi-open questionnaire were used. The obtained data were worked quantitatively, using percentage frequency, and qualitatively, using content analysis. It was concluded that, using knowledge management strategies, several opportunities for continuing teacher training in service take place in the planning meetings of the school's teaching team and considering that, the pedagogical actions are also planned in these meetings.

Keywords — *management of knowledge, pedagogical actions, fundamental education, structured interview, questionnaire.*

I. INTRODUCTION

In this era of globalization, competition at all levels is a reality. In this context, an organization needs to look for ways to gain advantage over the others to establish itself and be recognized as offering a good product to the society.

In Brazil, the basic education in the public schools is free of charge to the population and is of the responsibility of cities. However, in addition to the private initiatives, there are some schools maintained by the state and federal governments that offer elementary education on a smaller scale.

The fundamental school chosen for this study is maintained by the federal government and has about 250 students, most in early childhood education.

Analyzing the training background of the teaching staff, it is found that the work force that works on the campus is well prepared academically — many teachers have postgraduate degrees, some having masters' and/or doctorates—but there are also many with little or no experience in the classroom, and most are without the knowledge of how the work is developed at school. This is because most of these teachers have been working for less than five years in the institution, as shown in figure 1.

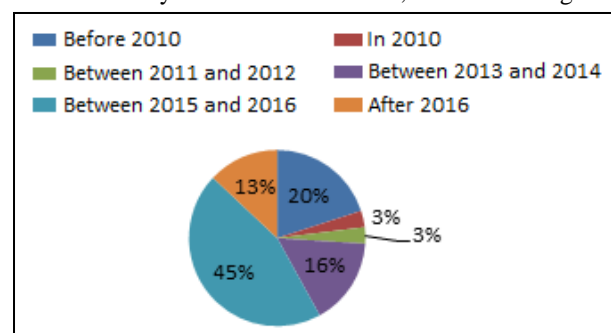


Fig. 1: Percentage of permanent teachers joining the faculty, per year. Source: Elaborated by the author

The absence of more in-depth knowledge on the part of the teachers about the pedagogical planning carried out in the institution that are applied with the students in the fundamental school itself, contributes to the need for continued training in service of all those involved.

The present article, using knowledge management tools, aims to evaluate the pedagogical management of this fundamental school in Rio de Janeiro, Brazil, aiming to reach levels of excellence in the educational area.

II. CONTEXTUALIZATION

2.1-Knowledge management

According to Davenport and Prusak [1], knowledge management is the collection of processes that govern the creation, dissemination and utilization of knowledge to fully achieve the objectives of an organization.

Nonaka and Takeuchi [2] define knowledge management as a characterization of the process of continuous creation

of new knowledge, disseminating it through the organization and rapidly incorporating it into new products or services, developing new technologies and systems that perpetuate change within the company. In their view, organizational knowledge grows when it is fully shared.

According to Nonaka and Takeuchi [2] and Angeloni [3], in order for knowledge to be generated, the organization must provide training conditions so that the individual can create organizational knowledge. Important factors to take into account include:

- Organizational Intention – Related to the aspiration of an organization, its goals and objectives. In general, efforts to achieve intent are framed within the organization's strategy.
- Autonomy of the members of the organization – Enables the self-motivation of the individuals to create knowledge, because the team will be able to meet the unexpected opportunities.
- Fluctuation and creative chaos – Situations are purposely inserted by top management in the sector/organization with the aim of stimulating creativity: through dialogue, through social interaction, seeking alternatives for solving the simulated crisis situation.
- Superfluity or Redundancy – Information that transcends the immediate operational requirements of organization members is intentionally overlapped, triggering an increase in the volume of information to be processed.
- Organizational Infrastructure – Promotes the creation and dissemination of knowledge when its members can change their context.
- Great number of requirements – Makes easy the confrontation on different situations by part of the members of the organization, when they can count on several requirements from a combination of information quickly and flexibly.
- Information Technology (IT) – The third dimension, which plays a fundamental role in the process of capturing, storing and sharing information and knowledge. However, it does not eliminate the importance of conversation, of dialogue between team members. Therefore, it is no use for the organization to exceed its span of human attention for the implementation of modern information technologies, believing that it is investing in knowledge management [6].

2.2-Training continued in service

The information society has brought many changes in its structure. These deeply affect the school and require a reassessment of its role in the world today. As Fávero

and Tornieto [4] state, the school has been challenged to rediscover its place in the information society. However, Libâneo [5] points out that although the school is affected in its functions, organizational structure, content and methods, it remains a solid and necessary institution for the democratization of society. It can be said that there is no pedagogical reform without teachers, because it is these professionals who are active and involved in the dissemination of knowledge.

In order to carry out the educational functions, the teacher needs to have had an initial training, which refers to the teaching of theoretical and practical knowledge for professional training, complemented by internships. But in order to keep up with the changes in the information society, in which knowledge and action are constantly changing, it is urgent that the teachers be able to find a continuous means for their education, a natural and legitimate context for the development of their practice, an action that happens with the collective and in the collective of the pairs, together with the pedagogical coordinator [7].

In his research, Christov [8] points out that the collective pedagogical work hours in the workplace itself are among the actions that make up a continuing education program in service. Its viability is, on the part of the educational institution, the organization of the school's work with a privileged time for collective and individual studies by the teachers. In these spaces there is the reflection on the practice of the educators involved, in view of the desired transformations for the classroom and for the construction of the participants' intellectual autonomy.

2.3-The role of the pedagogical coordinator in the school

In this perspective, it is essential to analyze the role of the coordinator and the pedagogical supervisors, such as the exchange of experiences between them and the teachers who work in classrooms, as this dynamic can enrich the on-going training of all involved in this educational journey.

Christov [8] explains that the essential attribute of the pedagogical coordinator is associated with the in-service teacher training process. The researcher points out that it is necessary to build new bases on which to think and to intervene in schools. And in this construction, the coordinating teacher serves as a fundamental agent to ensure that the moments of encounter between teachers and coordinators in the school are productive.

According to Geglio [7], the pedagogical coordinator's condition of being a continuing education agent is conferred on him by the position he occupies. Fusari [9] also emphasizes the importance of the school as a nucleus of continuing education and the pedagogical coordinator

as one of the professionals responsible for articulating this process.

Vasconcellos [10] notes that the coordinator must be questioning, unbalanced and provocative in order to value the collective effort and the cooperation among the teachers who work in the classrooms, encouraging them and providing them with elements that contribute to the growth of the team. Therefore, he understands that the coordinator plays an important role in the training of educators.

2.4-Structure of pedagogical management and planning meetings in the school

In the initial years of elementary education in this school, there is the figure of the pedagogical coordinators, teachers who work directly with a group of teachers who teach classes in certain years of elementary school, aiming at a better monitoring of the pedagogical plan.

They participate in the planning meetings of the teachers working in the classrooms of the common core, namely: Portuguese, mathematics, social studies and the sciences.

There are also teachers in the school who teach classes from other disciplines to the students of the initial years of elementary school, namely visual arts, physical education, music education, educational informatics and literature.

On a weekly basis, the teachers belonging to the school have, during their hours in the institution, a time for meetings with their peers, with pedagogical coordination and/or orientation. The aim of these weekly meetings is to build a quality of work to be developed with students, leading them to think and build their knowledge, always seeking partnership with families. In addition, questions are still raised and discussed that are observed regarding the development of students.

III. THE RESEARCH METHODOLOGY

For this study, a bibliographical search was carried out, through a series of materials published in several sources, used to construct the theoretical-methodological foundation of the research, on the following subjects: knowledge management, on-going teacher training and the pedagogical coordinator's work.

Descriptive research was also carried out, analyzing the perceptions of the group of teachers who work in the initial years of elementary education of the school regarding the opportunities for continuing education in service that emerged in the weekly meetings of planning.

A case study was elaborated, accomplished by interviews and use of a questionnaire with the faculty that works in that school.

The approach chosen to conduct this research was a mixed (qualitative-quantitative) method, considering that

there were both non-measurable data and data that could be analyzed by the use of statistical instruments.

A questionnaire was sent to all 48 persons who worked in the school observed in the 2017 academic year as either pedagogical staff (that are teachers, but don't work in the classroom) or classroom teachers. However, not everyone was able to participate as respondents. The sample thus corresponds to the 33 questionnaires returned. In addition, 16 individuals were interviewed, including permanent and temporary teachers of the campus, encompassing teachers from the different disciplines that are offered to students as well as classroom teachers and those who work in the pedagogical coordination and orientation.

Content analysis was chosen to apply to the qualitative data obtained. According to Gray [11], this is one of the most common approaches when there are qualitative data. It consists of making inferences about the data by systematically and objectively identifying special characteristics (classes or categories) between them.

IV. SEARCH RESULTS

The teachers in the group were asked about the use of some procedures for knowledge management, as highlighted by Paiva [12].

The following procedures were presented to the respondents:

- formation of practice communities or study groups;
- preparation of catalog of suggestions;
- mapping of best practices;
- formation of interest groups; and
- formation of virtual groups, so that those involved can resolve their doubts/present suggestions in social networks or through applications.

The results of this query are shown in Figure 2.

In 97% of the questionnaires returned, the elaboration of a catalog of suggestions was identified as one of the procedures of knowledge management used in the school. This cataloguing is done by filing a copy of each activity performed in the classes in a folder. In addition, each pedagogical coordinator maintains a digital file related to the activities carried out in each year of schooling.

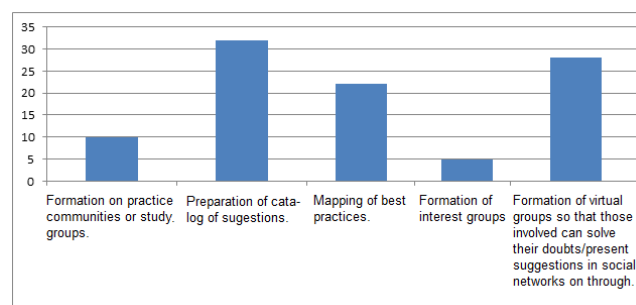


Fig.2: Procedures used in school for knowledge management, in the view of respondents. Source: Data obtained in the questionnaires.

As many as 84.8% of the respondents pointed out the formation of virtual groups so that those involved can resolve their doubts, present their suggestions and discuss the elaboration of activities outside the planning meetings in social networks or through applications as a knowledge management procedure used. The creation of groups of e-mails with WhatsApp and on Facebook is the most used. Among the respondents, 66.7% indicated that the mapping of best practices began to become a routine. The written and photographic records of the activities carried out are material for exhibition at the meetings of responsible persons, in the workshops held in the school auditorium and in congresses and symposiums in which the teachers participate. They serve as a source of inquiry so that any errors detected when performing the activity are corrected and not repeated.

Of the teachers who answered the questionnaire, 30.3% perceived the formation of practice communities or study groups as a knowledge management procedure present in the school. From the planning meetings and even in the function of the work developed, some teachers pointed out that they felt the need to study, in a group, subjects directly linked to the content worked, which supported them for better performance in the classroom.

Moreover, 15.2% of the teachers pointed out the formation of interest groups as a procedure of knowledge management present in the school. In the same way as the previous procedure, in relation to the work developed, the difficulties encountered and the problems to be faced, the teachers come together in interest groups, collectively seeking solutions that can be common problems or deepening discussion about themes of interest of the group.

The teachers were also questioned about their view on the existence of conditions that favor the creation, dissemination and socialization of knowledge in an organization, according to Nonaka and Takeuchi's Theory of Knowledge Creation [2].

The conditions presented in the questionnaire to the group of respondent teachers were as follows:

- Environment conducive to sharing ideas through creative conversations.
- Good relationships that favor/enable the creation of knowledge (social interaction, dialogue).
- Organizational intent.
- Autonomy of the members of the organization.
- Fluctuation and creative chaos (situations are inserted by management aiming to stimulate creativity).
- Superfluity or Redundancy (sharing among information organization members beyond immediate operational requirements, targeting intrusion learning).
- Great number of requirements (knowledge that comes from combining information quickly and flexibly).

- Organizational infrastructure (members of the organization can change context).
- Information technology (in the service of the circulation of the flow of information and knowledge in an effective way).

The results of this questionnaire are presented in Figure 3 below.

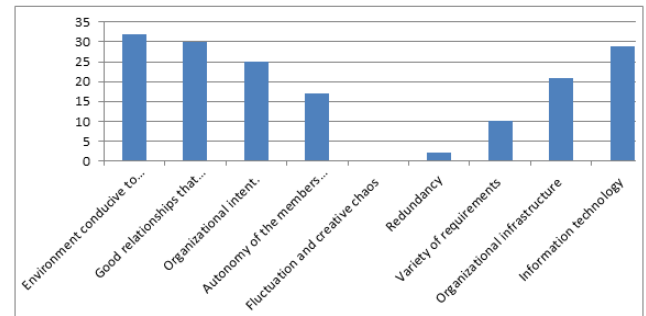


Fig. 3: Conditions that favor the creation, dissemination and socialization of knowledge in an organization present on the campus in the view of respondents. Source: Data obtained in the questionnaires

None of the respondents perceives it to be a practice of the school to carry out fluctuation and creative chaos. They do not identify it as a practice that pseudocrises, fictitious problem situations, are inserted by the administrators on the campus so as to stimulate the creativity of the servers to find solutions for them.

Only 6.1% pointed to redundancy or superfluity, the sharing among members of the organization of information beyond the immediate operational requirements, aiming at intrusion learning, as being present on campus.

Already, 97% of those who answered the questionnaires report that there is a favorable environment on the campus to share ideas through creative conversations. And the planning meetings are privileged places where this sharing occurs. It is the moment in which the pedagogical team and regent teachers (teachers who work in classrooms) present their ideas and these, collectively, are enriched by the contributions and participation of all those involved.

When questioned as to whether they perceived on the campus where they work that there are good relations that favor and/or enable the creation of knowledge, 90.9% answered yes. The social interaction and the dialogue are elements identified as present in the planning meetings, as well as in online or virtual communications, in which teachers exchange ideas for the construction of the work to be developed.

Regarding the organizational intention as one of the favorable conditions for the creation, dissemination and socialization of knowledge in an organization to be

present on the campus, 75.8% said they perceive this condition in their workplace. There are elements that prove that the *campus* has the intention to construct a collective working environment with dissemination and socialization of the knowledge that all can share. Those are:

- the existence of a common schedule between teachers of same school grade;
- the presence of a pedagogical team on campus, to make happen weekly work planning meetings and discussions about the problems experienced by teachers with their classes and students;
- in addition, the pedagogical seminars, held annually, are occasions when the campus presents the work developed for the entire community. There is also encouragement from the pedagogical team and even from the regent teachers that this work be presented in congresses and seminars in order to publicize the work done in the external community and society.

Teachers were questioned as to whether they perceived that members of the organization have autonomy for the creation, dissemination and socialization of knowledge on the campus, and 66.7% responded in the affirmative. After the presentation of the contents to be worked, of the objectives that they should achieve and from the discussions of possibilities of how the work can be developed, the teachers have the autonomy to carry out the work differently, attending to the interests and needs of their classes.

When questioned about the presence of the variety of requirements, that is, whether it is a common practice at school that solutions to the problems detected are solved by applying knowledge from the combination of information quickly and flexibly and by accessing information at all the levels of the organization, only 30.3% responded that they perceive this to occur in the school.

Teachers were also asked about their perception of whether the organizational infrastructure facilitates the creation, dissemination and socialization of knowledge, to which 63.6% gave the favorable answer. The institution conducts consultations among peers every three years for the renewal (or not) of the school's pedagogical team, and thus the members of the organization can change their roles, sometimes holding positions on the team of coordinating pedagogy for the school, sometimes being part of the team of regent teachers.

With respect to information technology, when asked if this effectively serves the circulation and flow of information and knowledge on campus, 87.9% of the teachers said yes. Teachers from different years of schooling and from different disciplines who work with the initial years of elementary education pointed out that

social networks and applications are great helpers that favor the circulation of information on campus and that it proves to be a facilitating tool for materials built collectively as well as ideas that are improved and shared among group members.

When questioned about whether, in their view, the planning meetings that the teachers participate in provide continuous in-service training for all teachers involved, 91% of the respondents said yes, 6% said that it was not, and 3% did not know how to respond.

The teacher-respondents cited actions developed in the meetings that provide continued training in service for all involved:

- In the planning meetings, the coordinators and the regent teachers present different work proposals. These proposals are collectively analyzed, discussed, expanded and then implemented. Subsequently, an evaluation is made of the work developed for new planning.
- In the planning meetings with the area coordinators and with the pedagogical guides, there is a discussion of the practices (the 'how to' in the classroom). Thus, with the participation and contribution of all involved, the practices are more dynamic and current.
- In the planning meetings, the pedagogical coordinators present and guide the teachers on how to use materials that stimulates the students and games in the classroom. In this way, some students are more effectively helped with their difficulties with the use of materials and concrete situations in which they are used.
- In the planning meetings, there is an exchange of experiences and information between all the teachers involved. The pedagogical supervisors carry out activities with the classes; they know the students and they exchange suggestions with the regent teachers about how to work with them. In addition, as these teachers often see the development of students over the years of schooling, they know their life histories and the problems their families are going through, and they exchange this information with the teachers who work with them within a given year of schooling. The system of pedagogical coordination presents alternative practices to be implemented with the students, which were developed in other years with other classes, but which proved to be successful experiences in that context.
- The campus pedagogic team encourages that teachers to document their work with the students and to present it at meetings, seminars, and conferences.
- At the planning meetings, there is a reflection on the part of the teachers, both the pedagogical team and the teachers in charge, as well as the exercise of their practices, in relation to the everyday experiences inside

and outside the classroom of all those involved at the meeting.

- The planning meetings provide for the sharing of ideas, knowledge, pedagogical practices and actions between the pedagogical team and the regent teachers.
- In the planning meetings, the pedagogical problems of the classes and the difficulties of the students are presented. After discussion, there is a collective survey of various teaching strategies, often innovative, respecting the diverse characteristics of the students and taking into account the difficulties encountered in each group.
- It is possible to share methodologies and activities to be developed in the moments in which the work is discussed. Often, after hearing the suggestions presented by the team, other ideas still appear in the meeting. In addition, sometimes, with the development of work, new paths are travelled.
- The pedagogical team guides the teachers in the development of the work in the planning meetings. From these guidelines, teachers are free to think about other proposals and/or extensions of those presented. In the meetings, there is the sharing of experiences with the group of teachers who work with that year of schooling.
- In the meetings, there is often the planning of activities differentiated according to the needs/difficulties of the students/classes.
- In the planning meetings, there is the exchange of materials and methodologies to be applied in classes. Members of the pedagogical team bring suggestions, and the classroom teacher presents their ideas.
- There is, on campus, the Nucleus of Attention to People with Special Needs (NAPSN). The core coordinator guides teachers on strategies for working with students with specific needs, both the regent teachers and those who interact with these students in the classroom, as well as those who perform Specialized Educational Assistance (SEA).
- The NAPSN coordinator provides teachers with information about the different syndromes or disorders that are presented by the students in the classes. It also gives guidance on how teachers can modify the work with these students in order to achieve their goals in the best possible way [13];
- The coordinator of educational informatics, the teachers of this discipline and even the teachers in other fields who are attuned to technology study and bring in new technological resources (software and hardware);
- The planning of interdisciplinary pedagogical projects, when the assembled campus thinks about the actions to be developed in order to achieve them, is a rich time for the exchange of experiences and opportunities for

continuing education for teachers. Teachers from all disciplines who work with the students and the pedagogical team present their proposals for work and, collectively, seek points where it is possible to integrate. In this way, team members think about the work as a whole, and there is an incentive to the research by the teachers for greater knowledge about the subjects to be approached.

- The dialogue that permeates the meetings allows the initial ideas presented by both the pedagogical team and the teachers to be improved and become a better quality work to be developed with the students.
- Planning always seeks to focus on the contextualization and integration of activities. The participation of all allows the development of a work in which the student has a more global vision of the world in which he/she lives. The exchanges of experience that happen favor the growth of all involved.

V. CONCLUSIONS

Based on the questionnaires and interviews, it was concluded that:

- Respondents indicate that in the school environment, they perceive the existence of several conditions that favor the creation, dissemination and socialization of knowledge and that such conditions favor the meetings for the continued in-service training of teachers.
- Respondents point to the existence of a favorable condition for the exchange of experiences in the planning meetings that result in the growth of all the participants.
- The preparation of a list of suggestions for the consultation of teachers to work, as well as the mapping of the best practices (with the record of the observations made by those who applied this work), is indicated by almost all the teachers on the campus as important so that possible flaws can be corrected.
- Organizational intent is also perceived as a present condition that makes a difference. The existence of common schedules between teachers working with the same year of schooling (in the timetable for teachers to stay in school), as well as the presence of a pedagogical team on campus, favors this social and professional interaction.
- The organizational infrastructure is noticed by most of the respondents as facilitator of the creation, dissemination and socialization of knowledge, since this is the case of a public institution that is obliged by Federal law, every three years, to make a consultation to fill the positions of pedagogical manager, coordinators and pedagogical guides.

- Most respondents feel autonomous in making some decisions about the work to be done with their classrooms, even though they understand that they do not have complete autonomy.
- Almost all of the respondents point to information technology as being a strong ally in this process of continuous training: the uses of social networks and applications facilitate the flow of information and knowledge flow effectively between groups for the development of work, serving as an extension of planning meetings.

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