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THE USE OF PRACTICAL CLASSES IN SCIENCE TEACHING: CHALLENGES AND POSSIBILITIES

A UTILIZAÇÃO DE AULAS PRÁTICAS NO ENSINO DE CIÊNCIAS: DESAFIOS E POSSIBILIDADES

EL USO DE CLASES PRÁCTICAS EN LA ENSEÑANZA DE CIENCIAS: DESAFÍOS Y POSIBILIDADES

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Abstract: Practical activities are methodologies and resources that can contribute in an attractive and meaningful way to effectiveness in science teaching and learning. The objective of this research was to evaluate how the teachers and students of the State Education Network of the city of Umuarama, Paraná, conceive and develop the practical activities in science classes, listing the reasons that hinder the use of these methodologies. For this, a survey was conducted seeking to know which strategies, resources and spaces are used in practical classes and also what challenges to develop them. Qualitative research was employed through semi-structured interviews with teachers and educators from five schools. The 9th grade students answered a questionnaire with closed and open questions. The results of the interviews with students showed little use of practical methodologies, although they show interest in the methodology and state that it also improves learning. In contrast, most of the teachers interviewed stated that they use this type of class, despite pointing out numerous factors that make it difficult to use this practice. They cited that the lack of laboratory and material, as well as maintenance in laboratory equipment are reasons that hinder such execution. Also, reasons such as: excess of students, indiscipline and the very poor academic and continuing education, make it difficult and cause insecurity in the execution of practical classes. The teachers pointed out that the practical classes are important resources as a complement to the theoretical classes and that their execution would be necessary more frequently. It was concluded that practical methodologies are desired by students and teachers, but there are factors that limit their implementation, despite being facilitating in the teaching-learning process.

Keywords: Experimentation, methodology, basic education

Resumo: Atividades práticas são metodologias e recursos que podem contribuir de forma atraente e significativa para a eficácia no processo de ensino e aprendizagem em Ciências. O objetivo desta pesquisa foi avaliar como os professores e alunos da Rede Estadual de Ensino da cidade de Umuarama, Paraná, concebem e desenvolvem as atividades práticas nas aulas de Ciências, elencando quais os motivos que dificultam a utilização destas metodologias. Para isso, foi realizado um levantamento

buscando saber quais as estratégias, recursos e espaços são utilizados nas aulas práticas e também quais os desafios para desenvolvê-las. Foi empregado a pesquisa qualitativa por meio de entrevistas semiestruturadas com os professores e pedagogos de cinco escolas. Os alunos do 9º ano do Ensino Fundamental responderam um questionário com questões fechadas e abertas. Os resultados das entrevistas com os alunos mostraram pouca utilização das metodologias práticas, apesar de demostrarem interesse pela metodologia e afirmarem que também melhoram a aprendizagem. Em contrapartida, a maioria dos professores entrevistados afirmou fazer uso desse tipo de aula, apesar de apontarem inúmeros fatores que dificultam o uso desta prática. Eles citaram que a falta de laboratorista e de material, assim como de manutenção em equipamentos laboratoriais são motivos que atrapalham tal execução. Ainda, foram citadas que razões como: excesso de alunos, indisciplina e a própria formação acadêmica e continuada deficitária, dificultam e causam insegurança na execução das aulas práticas. Os professores apontaram que as aulas práticas são recursos importantes como complemento para as aulas teóricas e que seria necessária sua execução com maior frequência. Concluiu-se que as metodologias práticas são desejadas pelos alunos e pelos professores, porém existem fatores que limitam a execução das mesmas, apesar de serem facilitadoras no processo de ensino-aprendizagem.

Palavras chave: Experimentação, metodologia, ensino básico

Resumen: Las actividades prácticas son metodologías y recursos que pueden contribuir de manera atractiva y significativa a la efectividad en la enseñanza y el aprendizaje de las ciencias. El objetivo de esta investigación fue evaluar cómo los maestros y estudiantes de la Red de Educación del Estado de la ciudad de Umuarama, Paraná, conciben y desarrollan las actividades prácticas en las clases de ciencias, enumerando las razones que dificultan el uso de estas metodologías. Para esto, se realizó una encuesta buscando saber qué estrategias, recursos y espacios se utilizan en las clases prácticas y también qué desafíos desarrollarlos. La investigación cualitativa se empleó a través de entrevistas semiestructuradas con maestros y educadores de cinco escuelas. Los estudiantes de noveno grado respondieron un cuestionario con preguntas cerradas y abiertas. Los resultados de las entrevistas con estudiantes mostraron poco uso de metodologías prácticas, aunque muestran interés en la metodología y afirman que también mejoran el aprendizaje. En contraste, la mayoría de los maestros entrevistados declararon que usan este tipo de clase, a pesar de señalar numerosos factores que dificultan el uso de esta práctica. Citaron que la falta de laboratorio y material, así como el mantenimiento de los equipos de laboratorio, son razones que dificultan dicha ejecución. Además, razones como: el exceso de estudiantes, la indisciplina y la muy baja educación académica y continua, dificultan y causan inseguridad en la ejecución de las clases prácticas. Los profesores señalaron que las clases prácticas son recursos importantes como complemento de las clases teóricas y que su ejecución sería necesaria con mayor frecuencia. Se concluyó que los estudiantes y maestros desean metodologías prácticas, pero hay factores que limitan su implementación, a pesar de facilitar el proceso de enseñanza-aprendizaje.

Palabras clave: Experimentación, metodología, educación básica.

Introduction

Faced with the problems that basic education has been going through in Brazil, presenting low educational indexes in external assessments (SANTOS; TERÁN, 2013), school failure, with high rates of disapproval, indiscipline, failure and truancy, interventions that can contribute to the improvement of the desired goals are necessary, overcoming these problems and in view the growing expectation of changes that education has demanded. These proposals

to improve learning and as a consequence the indices could add up to a set of measures ranging from public policies, school management and pedagogical practices in the classroom.

In the search for overcoming this reality, the implementation of different educational methodologies has been recurrent in recent years, in order to improve the interest, participation and motivation of students for science classes. One of the methodologies used are the practical classes and that can be an excellent tool that students interact with phenomena, perform procedures, appropriating concepts through contextualization, building up knowledge through the active participation in these activities. According to Rosito (2003), the experimental classes are considered essential for scientific learning in the teaching of science.

The use of practical activities in the teaching of science is something that has long been discussed by several specialists in the field of education (DOURADO, 2001; GALIAZZI, 2000; PRAIA et al, 2002) and that reach a consensus that there are several arguments to justify their insertion in the teaching and learning process. Practical activities are sometimes assisted in the development of content, however, it is up to the mediator to accompany his/her student, so the student does not only perform the procedures written in the experimental protocols, but reflects on the activity that he/she is making (GIANI, 2010).

Practical classes can often be performed in a specific space, for example, in a laboratory. The science laboratories are essential places for practical classes, although many teachers do not choose to use the space, stating that it does not have necessary and adequate material, that there is not enough time for the preparation of classes and that in many schools do not have laboratorists. They also argue that they lack security to control the class, knowledge to organize experiences and that the rooms have a high number of students (ANDRADE; MASSABNI, 2011).

Even with these difficulties, the teacher can also perform practical activities not only with sophisticated equipment or laboratories, because this is not the reality of most schools. With a little creativity and effort, the educator can use this methodology with reuse of materials or use low cost products, which can give good results and approaching science of everyday events.

Methodology

This research aimed to identify the pedagogical practices that are being recurrent in the classes of teacher from elementary school II. Through interviews and questionnaires, the

existence and conditions of the science laboratories were verified, as well as the frequency and mode of use of these spaces. Also, questionnaires were applied to the students in order to collect data to analyze the effect of these pedagogical practices in the teaching and learning process.

To obtain the data, five state schools in the urban area of Umuarama, Paraná, Brazil were chosen, one from each region: Central, North, South, East and West. This sampling was adequate for the local study, and 23.8% of the state schools in the city were evaluated, making considerable sampling and well-defined extracts. Data collection was performed by means of questionnaires and semi-structured interviews, with recording and transcription of the same according to procedures approved by the Ethics Committee in Research Involving Human Beings (CAEA certificate n ° 75761717.2.0000.0107).

We interviewed 271 students of the ninth year and 17 education professionals, as eleven professors of the discipline of Sciences, four pedagogical coordinators, a school director and also the technician responsible for the discipline of sciences with the Regional Nucleus Education (NRE). Aiming at data confidentiality, the education professionals were codified through the use of letters and numbers, being: "P" for Teacher (P1, P2, P3... P11) and "C" for the Pedagogical Coordinator (C1, C2, C3... C5). In addition, the schools visited using the letter "E" and Arabic numbers from one to five (E1, E2, E3, E4, E5) were codified. In this research will also be presented excerpts from transcribed interviews of teachers and pedagogical coordinators.

The education professionals were approached in relation to professional life and the methodologies that permeate the teacher's teaching practice. They were also questioned regarding the structure, maintenance and procedures of use of the school's science laboratory where it teaches.

The students were invited and answered a questionnaire evaluating frequency, form of execution and perception of learning of the practical classes of sciences. Illustrations were used to identify main equipment and glassware employed in the practices, since there was a difficulty in transporting such materials to each interview session and the students reported difficulty in memorizing the nomenclature of such items.

To analyze the data collected in the interviews and questionnaires, we used the fundamentals of the Bardin Content Analysis (2016), which suggests that the analysis of documents such as questionnaires and interviews can generate productive indications for the process of inference, contributing so that interpretations can mirror results validated by the method. The collected data were analyzed and grouped equivalently by means of categories.

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Results and discussion

The role of practical activities in science classes

The science laboratory and the use of practical classes were the main focuses of this study, since it was considered that the development of practical classes contributes significantly to the appropriation of the contents of science, making the educational process more dynamic and participative. Although the practical classes do not require a specific place to be performed, and can also be developed in the classroom, the laboratory is a place that allows a greater interaction of the student with the phenomena and structure the scientific knowledge through the visualization of facts and phenomena (BIZZO, 2009)

In a first investigation, conducted through telephone contact, among the 19 state institutions of basic education of Umuarama surveyed, five do not have science laboratories, one employs a small space adapted, in two of the same are deactivated or in construction and in 12 schools there are own spaces designed to carry out practical classes in disciplines such as science, biology, physics and chemistry.

After the on-site visits, in the 5 selected schools, it was found that one of them (E5) does not have a science laboratory, although this institution (as well as the others) received from the state government in 2010, a set of equipment, reagents and glasswork to practical classes. In the E5 these equipments were stored in boxes that some of these had even been opened. These equipments were acquired in order to promote the practical classes of science, however, as also found in other schools, these materials were being poorly utilized. Another important fact is that the other schools, in addition to elementary education also offered high school, a factor that may have contributed to the existence of the science laboratory in them.

Penteado and Kovaliczn (2008), emphasize that the absence of a science laboratory in the school, is not a reason not to perform practical classes, since they can be developed in other places and without the use of sophisticated and expensive equipment, it is possible to use alternative materials of low cost and easy access, without compromising the quality of the class

The 5 schools visited, 4 have large laboratories and have adequate structure, having their own place with benches, stools and sink with taps. It was noticed that although there were several materials to perform the practical classes, some of these laboratories were looking to be little used.

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It was noticed that the schools had a basic science laboratory structure available to students and teachers, and that despite the need for more equipment, reagents and glassware, simpler practical activities could be carried out during the Science classes, since among the schools participating in the research only one had no laboratory (E5), and the materials received from the State government in 2009 and 2011, were kept in boxes that do not want to form open by the teachers.

Most teachers consider that the laboratory and the practical classes facilitate the execution of the practices proposed by the textbooks and develop the creativity of the students. Krasilchik (2012) reports that practical classes try to promote innovation through investigative activities. Thus, it is understood that the lack of a structure such as the laboratory or the shortage of equipment or reagents does not preclude the development of practical activities that stimulate the research by the students.

The look of the pedagogical team of schools for the teaching of science and the practical classes

The pedagogical guardians who participated in the research were female, graduated in pedagogy with specialization in education and working on average for 24.6 years in the area and with 3 to 12 years in the role of pedagogical coordinator. Therefore, the professionals have already followed practically the entire schooling cycle of students in elementary school, phase II.

The interviewees considered that the development of practical activities and the use of the Science laboratory contributes to the learning of the contents of the discipline and that this practice provides the contextualization of the contents studied, which is observed in transcripts of the coordinators ' statements:

> [...] The teacher really manages to work with this practical part and manages to associate the theoretical with the practical, bringing more benefit to the student. So this benefit is the question of learning. [...] Thinking mainly that it is easier with the practice experiencing... This student appropriations more knowledge: (C1);
>
> [...] I understand that it is a rich learning space for our students, because it encourages them to enjoy research (C3);
>
> [...] Comes to give a better meaning to the content. The student sees, makes the contextualization, the student comes out of theory and comes to practice. So there, awakens its interest, awakens the search for scientific knowledge by inserting this process of the investigation itself (C5);

It is observed that the coordinators used in their statements the expression "to experience" as a way to refer theories to daily practice, so it is clear that for them this type of methodology allows the establishment of the relationship between theory and practice . Furthermore, it is observed in the statements that there is an understanding that the practical classes contribute to learning and develop interest in research, as mentioned by C3.

Another aspect cited by the interviewees is that the discouragement of students in studying is worrying and generates a general dissatisfaction in educators, as mentioned by Coordinator C1:

> Nowadays, we live a reality in which students are increasingly disinterested, discouraged by the question of studies and perhaps this also interferes in the willingness of the teacher to want to do something different, to provide different practices, in advancing.

In the area of science education there is a concern in constructing different practices seeking to awaken the interest of the student. This motivational aspect is mentioned in the coordinators ' speech, which mention that when students are invited to perform practical activities, they create interaction and engage in discussions, feeling more motivated and participating in the activities. They comment that the practical activities are attractive and can be considered by the teacher as tools of diversification. The advancement in the students ' interest was perceived, according to the coordinators, even in undisciplined students with low school performance, who present another behavioral profile during practical classes:

> [...] including that student who is more agitated, he is the one who stands out most. That student who sometimes gives more work in that class more in the classroom, that more monotonous class, is what stands out! [...]it is the class that you can even evaluate the learning of that student (C5).

C5 reports a positive influence of practical activities in school evaluation, indicating that students with low performance in the assessments present, with the execution of practical activities, greater learning and consequent better perceived in evaluations. For the C3 coordinator, students are already accommodated in solving lists of textbooks and that practical classes would awaken their interest in the discipline:

> [...] I see that it is very important, if possible, to further expand this use because it encourages our students to study, because they are accommodated only with the use of the book in the classroom, and does not bring a more curiosity, different from the use of the laboratory, That brings that curiosity, the new. So we realize that it is a tool of utmost importance and we would like it to be more used still, although we understand why our teachers are unable to use as much as we would like (C3).

The interviewed (C3) demonstrates understanding the limitations that teachers have in the development of practical classes and in using the Science laboratory. Andrade and Massabni (2011) indicate that when they cease to perform practical activities, teachers may be employing traditional methodologies in classes, prevailing oratory, chalk and blackboard and didactic book, minimizing reflections on the relevance that practical activities have in science learning.

Still in the interview, the coordinators also mentioned the lack of specific training that teachers have in relation to the practical classes of science. However, the interviewees report that with access to communication technology it becomes easier for the professional to search for techniques and material for the development of practical classes, and may even be sharing this information with the other teachers, as mentioned by the coordinator C5: "[...] There is lack of training too, although, with all the technologies, the teacher seeks experiments on Google, exchanging ideas with his peers [...] ". Thus, it is perceived with the statements of the coordinators that there are countless difficulties and that due to the same teachers end up leaving such classes for a second moment.

Thus, it is believed that little will work the adequate teacher training if there is not the creation of educational policies, involvement of school management and pedagogical team in favor of the initiative to develop practical activities, offering conditions, adequate spaces, materials and support. The school is a place of learning, and with many spaces that can be used for this purpose, and it is necessary that all actors unite in order to prioritize the students ' experience and this is a commitment to be assumed by the schools and not only by the professors of the area.

Elementary school teachers and perspectives regarding the teaching of Science

The professors interviewed considered in a stimulated way, as "very relevant" and "important" the development of practical activities in the science classes, as also observed in the speeches of the interviewees:

> [...] It's important for us to link theory to practice. We have to have this bridge, so that it actually happens to learning (P1);
> [...] I really believe, I do not know if it is because I learn seeing, I have to see, try, not only just look someone count, not just theory (P2);
> [...] I believe that it helps in contextualization, to show there, what is happening, proves in practice what we talked about in theory (P6);
> [...] They can better understand the content of the theory with practice (P9);

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These excerpts of the speeches relate this modality of class as a form of application of theory in practice. Andrade and Massabni (2011), believe that this methodology approximates the student of scientific research, besides allowing the observation and understanding of various facts that occur daily are tested, verified and argued, stimulating the scientific spirit. This aspect allows both the approximation of students who have affinity for research and those who do not have so much sympathy for the area.

Another relevant aspect mentioned by the teachers was that the practical activities promote the interaction among the students of the class, creating a friendly atmosphere and involvement among colleagues, which provides positive aspects for learning. Thus, Professor P5 mentioned this characteristic, exposing:

> [...] The student has better assimilation of the content, improves much more. [...]it is a means for students to work in teams, team organization, even more when they get involved (P5);

In teamwork is important the aspect of socialization, because in these the student learns to respect the opinion of colleagues, to listen and express themselves coherently and at the appropriate time, to argue and negotiate, sometimes repositioning their own ideas and putting their personal goals in the background in favor of the collective's longing (GALIAZZI; GONÇALVES, 2004).

The practical classes stimulate the division of tasks so that students create and assume responsibilities with themselves and also for the team, making agreements for the execution of activities and problem solving (OLIVEIRA, 2010). However, for these aspects to be achieved, it is important for the teacher to establish some rules of teamwork by encouraging the planning of activities to be developed, accompanying and guiding the execution and ensuring that all students can participate in the experiment.

In the teachers ' statements, it is noticed that the practical classes are important in complementing the theory and that contribute as a facilitating and motivative aspect of learning. Professor P2, for example, explains the primordiality that he has to "experience" so that his learning happens in fact. Thus, this necessity is reflected in his professional practice, where he plans and develops activities, where the student starts to have contact with the object studied and conditions the student to the possibility of experimenting in practice. All the professors interviewed stated that the science laboratory and the development of practical classes are part of their planning.

Regarding the use of practical classes in the science laboratory, the professors were unanimous in mentioning that they establish a relationship between theory and practice and that stimulates interest for science classes. In this same sense, Silveira and Peduzzi (2006) understand that the teaching of sciences contextualized between theory and practice, provides a vision of the sciences as a dynamic and interactive methodology between thought and action.

It is essential not to unlink the theory of practice, complementation the results obtained in the laboratory as the learning acquired in the classroom since, for Moraes (2008), the practical class without a well-established theoretical foundation is nothing more than activism. As also observed in the data of this research, the professors report that the practical classes serve as a mechanism of proof, connection of concepts studied in theory and reconcile theoretical subjects with practical, as was reported by the professors:

> It's important for us to link theory to practice. We have to have this link, so that it actually happens to learning (P1);
> It proves in practice what we already talked about in theory (P6);
> They are very interested in the experiment and the practice, end up helping in theory (P7);
> They can better understand the content of theory with practice (P9);
> I think the experimental class is important, because it helps to reconcile the theoretical part with practice (P10);

Table 1 presents the main reasons evidenced by the teachers of how the practical classes have helped in the teaching and learning process of the students in the discipline of sciences. These results go against the pointed by Araújo and Abib (2003), who cite that the experimental activities, in general, are carried out with the purpose of illustrating and making less abstract the concepts, phenomena or processes that are being studied and, Still serve as a motivational means for students. The motivation of the students is a positive aspect, but it determines the success of the practical activity. To Praia et. Al. (2002), the motivation and eagerness to experiment and observe the phenomena that can perform can produce an opposite effect and may even hinder learning.

Table 1 - How practical classes have assisted in the teaching and learning process of students in the discipline of sciences.

Contributions appointed	**Percentage**
Practice helps in understanding the theoretical content	90.9
Better contextualizes the theory learned in the classroom	90.9
Increased interest in science classes	90.9
Facilitated the appropriation of content by students	81.8

Motivates students to become interested in Science	72.7
Challenges students to seek answers to problems of their daily life	63.6
Helped indiscipline by improving student behavior	18.2
It can be more dynamic than in the classroom	9.1

[1] more than one alternative could be chosen
Source: Search data

Based on the teachers ' statements, the method used in the development of practical classes was classified into four categories: demonstration, experimentation, field classes and observation.

During the interviews, the professors mentioned some practices that they perform in their science classes. The methodology category of the most cited practical classes was the demonstrations. It is possibly the form of activity most used by practicality in the execution and in function of not having resources (space, equipment, reagents, etc.) in sufficient quantity so that all students can perform the experimental procedures. Another aspect cited is that demonstration activities do not escape the teacher's control, which can manipulate the experiment as needed, exposing the results progressively according to the advancement of the practice. Minimizing the risks of material manipulation is another item considered for the choice of demonstrative activities.

As for the periodicity that these practical classes are performed, the majority of teachers (42.6%) mentioned performing these classes once a month, a result similar to that indicated by Lima et al. (2013), who after interviewing teachers from the public network in Santa Catarina State found that most of them carry out practical classes monthly.

The participating students indicated preference for the practical classes of sciences to the detriment of other methodologies, a result that is according to Andrade and Massabni, (2011). However, contrary to what they preferred, the students pointed out that there is a small use of this methodology (Figure 1), and among the 271 respondents 27.8% answered never to have performed this type of activity, given that it shows how far the longing of and the way in which the discipline of Sciences is conducted. In the questionnaire with closed questions 43.8% indicated that classes are developed only once a month.

These data corroborate the research conducted by Torres Junior (2014), where the use of the "standard laboratories of Physics, Chemistry, Biology and Mathematics" provided by the MEC was investigated. In Paraná, only 10% of students reported having laboratory classes with some frequency (TORRES JUNIOR, 2014) still in this research, although most of them are not using this resource, the teachers acknowledge the importance of practical classes for learning.

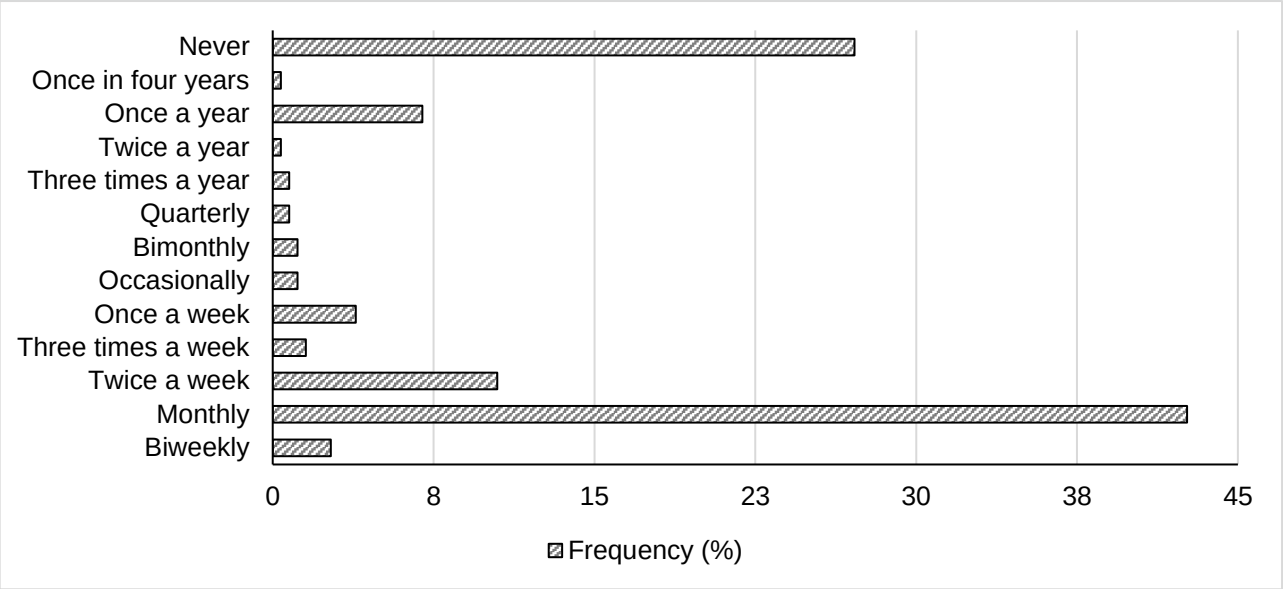

Figure 1- Relative Frequency of performing practical classes indicated by students
Source: Search data

Main obstacles aimed at conducting practical activities in Science classes

Countless are the reasons reported by teachers to the low realization of practical activities in the teaching of Sciences. In the interview it seemed that, in the teachers ' speech, a mixture of insecurity and anguish in relation to the realization of practical activities.

> I have a little fear of messing with some material, that sometimes, in the classroom space, God forbid something happens, there is no way to get out right! An accident happens, so I have this fear (P5).
> The challenges are the lack of laboratories, the numerous classes, lack of material sometimes, lack resources even, sometimes students have to bring everything from home so we do some experimentation! (P11).

In table 2, the main problems mentioned spontaneously by teachers were placed. It was noticed that both spontaneously and stimulated, which was also proposed in the research, one of the main justifications for non-accomplishment is the lack of laboratory.

Table 2 - Main reasons that hinder the realization of practical classes, expressed in the spontaneous responses

Reasons	Teacher[1]
Lack of laboratory	P1, P4, P5, P7, P8, P9, P10, P11
Lack of material	P2, P3, P5, P6, P10, P11
Insufficient time to prepare classes	P5, P7, P8, P9, P10
Very numerous classes	P4, P6, P9, P11

I'm afraid there's an accident	P5, P8, P9
Students ' indiscipline	P4, P8, P9
Inadequate space	P5, P6
Excess content	P9

[1] Quotations related to 11 teachers interviewed, coded from 1 to 11 (P1, P2, ..., P11)
Source: Search data

The biggest difficulty pointed out by the teachers participating in this research was the lack of laboratory workers, claiming that without this support, it is difficult to use the laboratory and to carry out practical classes, even in other spaces of the school. The other difficulties mentioned by the teachers in this research were also reported in other works, such as high number of students per class (LIMA, GARCIA, 2011; LIMA et al., 2013), lack of time to prepare practical classes (ANDRADE, MASSABNI, 2011; LIMA et al., 2013), inadequate physical space and lack of materials (RAMOS, ROSA, 2008; ANDRADE and MASSABNI, 2011; LIMA, GARCIA, 2011; LIMA et al., 2013) and teacher unpreparedness to develop activities practices (RAMOS and ROSA, 2008; LIMA et al., 2013.

Regarding the lack of laboratories, it is noteworthy that in 2005 a public tender was held in Paraná, which hired 414 professionals to act as Execution Assistants in the Science (Chemistry, Physics and Biology) laboratories of state schools. These professionals had as one of their duties the assistance in the preparation and execution of practical classes, thus facilitating the work of teachers of science. According to the pedagogical technician responsible for the Science discipline of the Umuarama NRE, such Executing Agents came to perform a function of assistance in laboratory activities in some schools, but in many were idle due to the low demand for science laboratories. In the words of the NRE coach:

> [...] what I can tell you is that what came to me, that this position was extinguished due to the lack of use of the laboratory, that is, they were assigned to the laboratory and ended up doing other things, because they didn't have the to do, they were obsolete at school, that is, they were not used for the function they were hired.

Due to the lack of employment of these professionals in the aid of practical activities made them assume administrative activities and / or assist in the activities of the computer lab of schools, distorting them from the function for which they were hired. Thus, the role of enforcement agent was soon extinguished through Complementary Law 123 of September 9, 2008, published in the Official Gazette no. 7802 of the same date, being thereafter in the position of Educational Agent II, becoming part of the Staff of Basic Education (QFEB),

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assuming administrative duties. Therefore, the existence of a laboratory function did not last even two years of implementation, being immediately extinct, among other reasons, because they are not being used for this purpose.

Regarding the lack of materials, 54.6% of the teachers reported lack of equipment, while 36.4% indicated the lack of reagents. This result is in agreement with Penteado and Kovaliczn (2008, p. 4), who mention that:

> [...] the lack of laboratory materials for science teaching in many of the public schools of Paraná is one of the factors that make this subject uninteresting for the student and determines the teachers' work in organizing practical classes that complement the classroom theoretical discourse.

The lack of these resources may compromise the development of a good practical class, since the availability of didactic resources allows (and stimulates) more frequent and higher quality classes, attracting more students' attention to the studied content, awakening in them the investigative spirit and stimulating them in intellectual growth. As in the questionnaires, this fact was also mentioned in the teachers interview: “I think today my main obstacle would be the lack of material at all. Different material to work these classes (P2) ”.

It is noteworthy that the lack of resources can sometimes be filled with the use of alternative teaching materials, which can be created or reused by teachers. Berezuk and Inada (2010) highlight the importance of the teacher's role in creating, organizing materials for practical classes. Creatively, most of the practical activities can be developed with cheap and easily accessible materials, being easy to handle and practical when setting up an experiment (BARROS; HOSOUME, 2008). However, the teacher's versatility and commitment to finding alternative solutions cannot exempt the State from its responsibility to maintain appropriate working conditions by providing adequate material resources for carrying out the lessons, as adaptations may lead to the development of practical activities. insecurity, impoverished and modest, and may not achieve the pedagogically proposed objective. According to the interviews, it seems to be common among the teachers who participated in this research the attempt to adapt and solve these problems so that the activity happens:

> [...] I even bring little bags, I bring that lot of things to school, there are days when I pick up a lot of things and my car comes full. Eh! sometimes I go looking for something at home, and it's here at school (P2);
> Most of the time I ask students to bring, but not everyone can bring this material, usually we do activity but not everyone can participate,it can not reach 100% of the class (P3);
> [...] Sometimes students have to bring all the material from home, so we can do some experimentation (P11);

According to information from NRE-Umuarama between 2009 and 2011, the State Department of Education of Paraná acquired equipment, glassware, materials and reagents for science classes, which were distributed to all state schools.

This diversity of materials makes it possible for the teacher to perform numerous practical activities. Another aspect to be considered, according to the reports, is that the purchase of ready-made kits and / or predetermined lists does not meet the expectations of all schools since they have different realities. It should be recalled that despite the availability of these materials available to Science teachers, their use falls short of expectations, as 42.6% of teachers report using practical classes once a month and 10.5% twice a month.

Ramos and Rosa (2008) investigated the reasons for using / not using practical methodologies and identified that the lack of preparation of the teacher was recurrent with the sample of teachers they investigated. This lack of preparation can negatively influence the selection and acquisition of inappropriate materials, since teachers within the school staff participate in the purchase process and recommend purchasing only items they know and / or are interested in using.

Comparing the students' responses on the use of laboratory resources, there is some similarity in what was pointed out by the teachers. However, some discrepancies were noted in the use of some items, such as the rock and mineral samples, which were used by 81.8% of teachers but only 38.9% of students in Sciences. In general, the percentages of use indicated by the teachers was higher than that indicated by the students.

Final considerations

It is important to emphasize that this research arose from a need to understand how teachers and students use and what is the relevance for them of teaching methodologies through laboratory practical classes, having as research place the city of Umuarama, PR. Also, it was intended to verify how they contributed in the learning of the contents of Sciences.

Discussions about the functions performed by practical activities in science teaching have accompanied the theoretical and methodological discussions about the teaching itself. Debates about educational themes, in most cases, only cover the academic level, often being restricted to universities, and teachers of basic education, without direct participation in the construction of the foundations about them, end up having access only to segments. or parts of

expert research, continuing education courses, or institutional materials imposed for teacher study.

However, this subject should be further discussed and researched by the primary teachers themselves, who are directly involved with students, and they know better which methodologies are most effective in facilitating learning. Therefore, if teachers, besides research objects, were also researchers, they could attest to the viability of the methodology, specifically reporting the perceived complications in the execution of the activities, with a better veracity.

In this sense, we emphasize the importance of discussing practical activities in real and viable contexts, where the deficiencies in teacher and student training conflict with the lack of school infrastructure. In this reality, carrying out practical activities in order to bring the classroom closer to the context of the production of scientific knowledge is practically a feat, as it is necessary to overcome the many obstacles that hinder the improvement of the quality of education in Brazil.

The practical activities are a possibility that the teacher has to enrich their classes, executing when possible their realization, but they cannot be planned to be used constantly, as they are not the only strategy for an efficient science teaching. It is also important to overcome the idea that these classes serve only as a link between theory and practice, as they are fundamental in the process of conceptual change and knowledge construction, contributing to the formation of more critical and more autonomous students. Thus, we believe that students do not only take ownership of the contents, but that they can also build knowledge about science itself, perceive the reciprocity between science, society and the mechanisms necessary to build scientific knowledge.

According to a study by Sasseron (2015), many Brazilian schools have their science labs out of use or disabled, because these spaces have not received proper attention. Teachers prioritize other types of methodologies that do not require so much time, cost and work and end up leaving practical classes and the use of laboratories, so these places end up having no maintenance and replacement of materials, and even end up being adapted to performing other activities.

Regarding the maintainers and management of schools, it is important to raise awareness of the need to improve the teacher's workplace, providing the necessary materials for practical classes, equipping and providing conditions for use in science and computer laboratories, promoting the revitalization of gardens, orchards, woods and other spaces that can be used for practical classes. Such changes could demonstrate how much the school and the school

community value and care for the use of these environments in the teaching-learning process. Therefore, principals, coordinators and teachers should join forces and seek conditions so that the practical classes and the science laboratory were part of the school routine and concretely contributed to the students' learning.

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