



Different didactic strategies in science teaching: informative text and video

*Diferentes estratégias didáticas no ensino de ciências:
texto informativo e vídeo*

*Diferentes estrategias didácticas en la enseñanza de las ciencias:
texto informativo y vídeo*

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Abstract: This article consists of an experience report about one of the activities developed during the Masters Course in Science Teaching at the University of the State of Amazonas – UEA, in the discipline Instrumentation for Science Teaching. The use of different strategies can assist the teacher in teaching-learning processes, as well as encourage students to discuss important issues about science in the classroom. The use of informative texts and educational videos are important tools to develop the reading and interpretation capacity of an autonomous subject in the course of his or her own learning. Besides attracting the attention of students to the topic discussed in the classroom, the use of didactic strategies in science teaching is considered an essential alternative to achieve important results in understanding the content taught, thus improving student learning.

Keywords: Didactic strategies. Informative text. Educational video.

Resumo: Este artigo trata-se de um relato de experiência sobre uma das atividades desenvolvidas no Curso de Mestrado em Ensino de Ciências na Universidade do Estado do Amazonas - UEA durante a disciplina Instrumentação para o Ensino de Ciências. O uso de diferentes estratégias pode auxiliar o docente nos processos de ensino e aprendizagem, além de incentivar os alunos a debaterem questões importantes sobre Ciências em sala de aula. A utilização de textos informativos e vídeos educativos são importantes instrumentos para desenvolver a capacidade de leitura e interpretação de um sujeito autônomo no percurso de sua própria aprendizagem. O emprego de estratégias didáticas ao ensino de Ciências, além de atrair mais a atenção dos alunos ao tema discutido em sala de aula, é considerado como alternativa essencial para se alcançar resultados importantes na compreensão do conteúdo ensinado, melhorando assim a aprendizagem dos alunos.

Palavras-chave: Estratégias didáticas. Texto Informativo. Vídeo educativo.

Resumen: Este artículo es un informe de experiencia sobre una de las actividades desarrolladas en el Máster en Enseñanza de las Ciencias en la Universidad Estatal de Amazonas - UEA durante la disciplina Instrumentación para la Enseñanza de las Ciencias. El uso de diferentes estrategias puede ayudar al maestro en los procesos de enseñanza y aprendizaje, además de alentar a los estudiantes a debatir cuestiones importantes de ciencias en el aula. El uso de textos informativos y videos educativos son herramientas importantes para desarrollar la capacidad de leer e interpretar un tema autónomo en el curso de su propio aprendizaje. El uso de estrategias didácticas para la enseñanza de las ciencias, además de atraer más atención de los estudiantes al tema discutido en el aula, se considera una alternativa esencial para lograr resultados importantes en la comprensión del contenido enseñado, mejorando así el aprendizaje de los estudiantes.

Palabras clave: Estrategias didácticas. Texto informativo. Video educativo.

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Introduction

In the face of the changes we see happening in today's world, it is necessary that students be moved to investigate, question, and be autonomous in the learning process.

Science teaching should not be based only on the memorization of concepts, but rather associated with the promotion of the process of knowledge acquisition that occurs through the student's perception regarding the subject studied. In this way, what can favor the acquisition of this knowledge is the use of different didactic strategies for teaching science.

In keeping with what was stated above and in our experience over a few years of teaching, we have noticed that the vast majority of students present difficulties in assimilating science content. Perhaps this difficulty arises because of a complex nomenclature, with a large number of scientific names. Thus, we believe that the use of different didactic strategies becomes relevant, since, when well conducted, it can contribute to a truly effective learning.

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In the wake of this knowledge, we emphasize the importance and necessity of teaching practices that allow challenging opportunities that instigate the student's reasoning, articulating the knowledge he/she already possesses and expanding this knowledge with relevant new information.

Therefore, science teaching has been a great challenge for teachers in the sense of making the content taught come closer to the students' reality. Regarding this, the National Curricular Parameters (NCP) of Natural Sciences (BRASIL, 1998, p. 26) points out: "the importance, the interest that can be aroused from the variety of subjects that involve the teaching of Natural Sciences, which has been frequently conducted in an uninteresting and unintelligible way".

Hence, when discussing knowledge about the sciences, it is essential not only to emphasize memorization but also to foster circumstances that enable students' cognitive development.

In this sense, technology and media that disseminate information are indispensable tools "for a better quality of teaching, since classes need to be in constant transformation" (PAZZINI; ARAÚJO, 2013, p. 4).

As an aid in the teaching process, we have informative texts that can act as complementary readings capable of facilitating the insertion of new concepts about contents already addressed in the classroom. These texts are, therefore, an alternative to enrich students' understanding of certain topics. They can be extracted from newspapers, magazines, textbooks, encyclopedias, scientific articles, and reliable websites, so they can be worked in the classroom. The choice of informative texts and their approach in the classroom will depend on the creativity and intentions of the teacher.

The educator may choose, for example, to use texts that are not so complex but also not so superficial. Teachers, especially those in science, can read these informative texts with

their classes, taking advantage of students' curiosity to create study and research situations, as well as problematizing the topic under discussion.

Another interesting didactic strategy may be educational videos that, when appropriate to the subject studied, help in the process of teaching and learning concepts due to pedagogical practice dynamization. Educational videos are used by many educators as tools that help in the learning process by provoking the student's desire, curiosity, and interest in learning the subject studied. Research aimed at the educational area points out the contribution of these resources to teaching and, in particular, to science teaching (BASTOS; REZENDE FILHO; PASTOR JUNIOR, 2014).

On this matter, Leão, Dutra and Alves (2018) emphasize that it is necessary to consider that audiovisual media and technology are part of students' daily life, so it is possible to use these resources for educational purposes. These strategies can improve the circumstances of knowledge acquisition in the classroom.

We believe that the purpose of using these didactic resources is to develop an investigative posture in students, so that they can find out more information about subjects that instigate questions. The use of these didactic strategies can contribute to student learning, facilitating the assimilation of some contents in the classroom.

In view of the above, this report discusses how science teaching is approached in the classroom, discussing different didactic strategies for science teaching, and, finally, the application of teaching strategies: Informative Text and Video.

This article reports the practice experienced when doing an essay on the use of videos and informative texts for science teaching during the Masters Course in Science Teaching at the University of the State of Amazonas – UEA, in the discipline Instrumentation for Science Teaching.

How has science teaching been approached in the classroom?

Many researches show that science teaching is permeated by several obstacles, and that therefore students have difficulties in assimilating content in this area of knowledge. They do not understand and cannot relate the contents studied in the classroom with their daily life (POZO; CRESPO, 2009).

The way in which science content is approached in the classroom often does not favor students' understanding of how this discipline is present in everyday life, thus they do not realize the real importance of learning it.

Regarding the problems and challenges that surround science teaching, Nascibem and Viveiro (2015, p. 287) state:

The dialogical relationship between theory and practice is often ignored. Classroom practices prioritize decontextualized knowledge and the memorization of formulas and expressions. In this way, science education is not a stimulant of students'

curiosity, it does not favor interest in the area, and it contributes little to the explanation of everyday phenomena and to a better relation between these students and the environment in which they live.

Hermann and Araújo (2013) explain that since teaching is commonly fragmented; students do not have a broad view of how the process occurs, which hinders the acquisition of knowledge.

Teachers often adopt in the classroom only the expository teaching, the one that makes the student a mere spectator, using exercise repetition and thus prioritizing memorization over actual learning (HERMANN; ARAÚJO, 2013).

The National Curricular Parameters of Natural Sciences recognize that:

The study of Natural Sciences in an exclusively bookish way, without direct interaction with the natural or technological phenomena, leaves a huge gap in the training of students. It denies the different interactions they may have with their world, under the guidance of the teacher. On the contrary, different active methods, with the use of observations, experimentation, games, different textual sources to obtain and compare information, for example, arouse students' interest in the contents and give meanings to nature and science that are not possible when studying Natural Sciences only by books.

The understanding of what is science through this encyclopedic, bookish, and fragmented perspective does not reflect its dynamic, articulate, historical, and non-neutral nature as it is currently posed. The perspective of science as an adventure of human knowledge, based on procedures, needs, and different interests and values, is absent (BRASIL, 1998, p. 27).

In this way, the teacher's role in making students understand the meaning of learning is paramount. According to Ovigli *et al.* (2007), the role of the science teacher in the educational life of the student is of great importance to help him/her to understand the problems that involve the practice of teaching this discipline, especially in the early years of education.

On the difficulties of teachers in Science teaching, Delizoicov, Angotti and Pernambuco (2011, p. 31-41) state:

The challenges of the contemporary world, particularly those related to the transformations through which school education must pass, have a direct impact on initial and continuing teacher training courses, whose established and disseminated knowledge and practices point to a misunderstanding of exhaustion. [...] In most courses, teacher training is still closer to the 1970s than to today.

Students must be moved from a passive posture to one that is active in the learning process. From the moment the student understands the meaning of learning, there is an internal stimulus for this to happen (RAASCH, 1999).

There are many reasons that make science teaching useful in anyone's education. This is because at all times we have to make choices that influence our health, our well-being, and biological knowledge helps us to choose the best alternative to safeguard our lives (CASAGRANDE, 2006).

In the next topic we will discuss the importance of different strategies in science teaching, aiming to make teaching more speculative, engaging, and stimulating for students.

Different didactic strategies for science teaching

There were moments in the history of education where teaching was the sole concern of the teacher, so that he/she was the absolute holder of knowledge. However, over the years and with the emergence of new technologies, it has been realized that the teacher is only part of the teaching-learning process. Rodrigues *et al.* (2015) comments that a few years ago teaching was aimed at content transmission, without the concern of how it reached the students.

Regarding science teaching, the National Curriculum Parameters presents goals in terms of the development of competences that allow the student “[...] to understand the world and act as an individual and as a citizen, using scientific and technological knowledge” (BRASIL, 1998, p. 31). Therefore, teaching science means that in addition to program content, students will also learn citizenship, ethics, and values.

Notwithstanding, how to teach science nowadays aiming to catch the attention of students given the sheer volume of information accessible through the internet and through a simple handling of the cell phone? Many authors lead us to think of strategies to make teaching more attractive, enjoyable, and more understandable to the student.

There is knowledge inherent to the teaching practice, built during the teaching process, so-called “know-how of knowledge” (PIMENTA, 2012); “knowledge of education sciences” (GAUTHIER *et al.*, 2013); and “knowledge of education sciences and pedagogical ideology” (TARDIF, 2014). These authors present more terminologies focused on pedagogical practice, but we will cite only these three. Regardless of nomenclatures, the authors agree that obtaining this know-how and maturing these notions is necessary for teaching.

According to Pimenta (2012), for developing strategies it is necessary to improve the knowledge that arises from the manipulation of information, a process that involves the classification, analysis, and documentation of these data. In other words, it is a strategic organization of ideas whose purpose is the improvement of scientific knowledge. Regarding the strategies that involve the teaching practice, Farias *et al.* (2011) commented that it is necessary to think over daily teaching to improve school education.

Tardif (2014) presents the knowledge of education sciences and pedagogical ideology as something that is already learned in the first steps of teacher training, which must be progressively improved by the teacher in the classroom.

Maturing knowledge during training refers to the didactic transposition that, according to Nardi and Castiblanco (2014, p. 18), does not configure something simple, as is inferred from the passage below:

[...] teaching science is broader than teaching concepts and theories, so it is necessary to research didactic processes that respond to new teaching and learning goals, such as teaching the interpretation of phenomena, going beyond teaching established truths.

From the above, it can be concluded that from the perspective of the authors, it is necessary to mature pedagogical processes with the purpose of contributing to the teaching-learning process with a view to breaking the limits of “established truths”, viewing teaching as a broad procedure.

Nardi and Castiblanco (2014) highlight the idea that the teacher should focus on the importance of the congruence between his/her speech and his/her teaching practice. According to these authors, the professional must keep theory and practice in line when implementing new teaching strategies.

In the light of the above, we thought useful to bring about the concept of the word “strategy” put forward by Bizerra and Ursi (2014, p. 83), who define it as “the art of applying or exploiting favorable and available means and conditions with a view to achieving specific goals”. In other words, the expression “strategy” implies the use of previously established means in the achievement of predetermined and specific goals. Within the context of this study, the means applied relate exclusively to science teaching.

Regarding methodological strategies for science teaching, Wilsek and Tosin (2012, p. 20) emphasize the importance of teaching science considering events of the student’s reality, promoting reflections and debates favoring “the integration of scientific knowledge with everyday situations of the student”.

In his studies on teaching strategies, Moraes (2016) demonstrates that books, didactic models, games, comic books, software, and blogs can be used for teaching science.

Bizerra and Ursi (2014) cite likely criteria for classifying teaching strategies, enumerating these strategies as follows: (1) **talking** would be the first step, that is, speech directed to lectures, discussions, debates; (2) **practice**, aimed at the execution of simulations, practical classes, games, projects, among others; and (3) **demonstration** through films and videos.

Adding to the discussion of teaching strategies, Barros, Zanella e Araújo-Jorge (2013) argued about the value of music as a strategy for teaching science. In fact, the field of improvement and goal setting, aligned with its achievements, is broad, escaping from the traditional way of teaching. It is for no other reason that scholars such as Nascimento and Duarte (2014) understand that didactic practices outside the conventional standard facilitate the learning process.

There are many examples of strategies for teaching science, such as: lectures, demonstrations, practical classes, fieldwork, simulations, games, music, informative texts, videos. All such methodological tactics must be carefully planned before execution. This planning goes through research, study, and detection of possible obstacles, being, therefore, an essential step for success in the teaching process.

Emphasizing the importance of developing didactic methods, Moraes (2016, p. 20) explains that “by linking methodological trends and science teaching, one can see that this type of teaching still carries the principles of traditional education”. Eleutério (2015, p. 96-97) points out that this way of teaching “needs to be broken, since it is often a decontextualized and fragmented (that is, isolated to the context of the students) way to refer to disciplinary contents, contextualization appears in school spaces with the intention of breaking with the traditional form”.

Therefore, it is clear that in basic education, science teaching must have goals based on the responsibility of training individuals capable of exercising a responsible, solidary, and active citizen life, contributing to the community in which they live (BORGES, 2012).

Following the same line of thought about different teaching strategies, in the topic below we will show an essay on the application of useful strategies in the classroom: informative text and video.

Application of teaching strategies: informative text and video

This experience report originated in the discipline Instrumentation for Science Teaching, of the Postgraduate Course in Science Education and Teaching of the University of the State of Amazonas. One of the evaluation activities requested by the Instrumentation teacher was to develop and apply a research activity in the classroom. The teacher proposed the following lines for the development of the practice, which should be selected by the working groups: Teaching by Research, Hypothetical-Deductive Method, Experimentation, Different Strategies for Teaching Science (Observation, Group Work, Informative Texts, Videos, Model Building, Interviews, and Research Project).

Masters students were asked to prepare a seminar and to develop the application of the method according to its respective theme, focusing on elementary or secondary education. We chose the theme: “Different Strategies for Teaching Science”, and among the various strategies we chose Informative Text and Video.

Our choice is justified because they are easy-to-access didactic tools, in addition to allowing a dynamic relationship between teacher and student with the introduction of topics related to students’ daily life, contributing to the learning of the content addressed.

That said, we will describe the application of the practical activity during the discipline Instrumentation for Science Teaching with the group of master’s students of the Science Teaching Course in the State of Amazonas. It is important to highlight that this activity was developed to be applied with elementary school students. However, due to the short time of the discipline (and considering that we were not able to apply it a priori to an elementary school class), we applied it during the course of the discipline cited.

Firstly, we started our class with the seminar, which focused on approaching the methods that we would use in practice. We conducted research on the chosen strategy aiming

to explain what an informative text is, what types of informative texts exist, and how teachers can use them in the classroom.

We emphasize that the use of innovative didactic strategies is of great relevance for learning, making some subjects considered complicated to be better understood by the students. In this respect, “the use of different didactic resources in the classroom can be considered as a powerful strategy for the promotion of learning” (MORAES, 2016, p. 14).

During the application of this activity, we commented on the videos as being an important ally in the teaching and learning processes due to their dynamization. Moreover, we highlight the care that the teacher needs to have when relating the video to the contents discussed in the classroom, making the student understand that this resource is part of the lesson.

Concerning this, Pazzini and Araújo (2013) affirm that the insertion of media resources, such as the use of videos, allows the awakening of creativity, drawing the student’s attention to what he/she is visualizing, evoking sensitivity and emotions and enabling them to contextualize subjects.

We also address some inappropriate ways of using videos in the classroom, as mentioned by Morán (1995):

- a) Gap-filling video: using video on an unexpected occasion, in the absence of a teacher, for example;
- b) Time-wasting video: playing a video decontextualized with the discipline content;
- c) Video dazzle: immoderate use of videos in the classroom;
- d) Video only: using the resource without objectivity.

After exposing theoretical approaches to didactic strategies, we performed an essay on the application of our investigative method. Our lesson plan was aimed at a group of the 6th year of elementary school. The curricular unit developed was Sciences and the theme addressed was the Nervous System. The purpose of this activity was to develop the students’ ability to read, interpret, reason, and disseminate scientific knowledge about the subject addressed, as well as to share data and concepts.

We started the class exhibiting a video¹ with the theme “Laughing is contagious”. Regarding this activity, Santos (2014, p. 32) highlights that “before showing the video in the classroom, it is fundamental that the teacher incites curiosity and encourages the students to watch the film closely, informing them about the didactic activities that will be further developed”.

After the exhibition, we asked the students (masters) what impressions they had about what they observed in the images. One of the students expressed that after the man in the picture began to laugh everyone who was on the subway also started to laugh even without knowing why. From this we asked: Why does this happen? The students did not know how to answer correctly, with many evasive answers.

The initial intention of the video was to provoke the students' curiosity, leading them to think over the content assisted. Later, the questions that came up were answered through the informative texts made available shortly after the presentation of the video.

Then we moved on to the complementary reading of the informative textⁱⁱ "Why is laughter contagious?", aiming to reflect with the students on the scientific knowledge of new information. After reading the text, we asked: **What new information did the text bring you?** One of the students commented that she knew that by observing a person smiling, we naturally reproduce this action, but had never heard that the responsible for this reproduction are the "mirror neurons". All expressed ignorance of this information. Thus, the understanding of the text can be viewed as an interactive mode that implies the construction of the meaning of the text.

As for the use of informative texts in the classroom, NCP suggest that these texts offer students familiarity with several types of texts, aiming to stimulate reading and the ease of assimilation of this information in science teaching.

It is important that the student can have access to a diversity of informative texts, since each of them has its own structure and purpose. They bring different and often divergent information on the same subject, besides requiring mastery of different skills and concepts for their reading (BRASIL, 1997, p. 124).

After reading and discussing the text, another videoⁱⁱⁱ: "Why is yawning contagious?" was presented to complete and reinforce what was discussed in the informative text.

At the end, we emphasized to the students the importance of contextualizing the informative text and videos to the studied subject. The use of teaching strategies aims at stimulating in students the spirit of curiosity, not by imposing contents to them, but rather by questioning them, instigating them to develop a research attitude, to know the reason of things.

Final considerations

Didactic strategies, especially informative texts and educational videos, are tools that contribute to the acquisition of knowledge by the student, since he/she experiences different forms of learning. Science teaching cannot be restricted to only one method, since the use of different strategies can favor moments of collective interaction, thus enabling knowledge sharing among students, also collaborating as a stimulus for self-confidence and autonomy of the individual inserted in the educational process.

Teachers can relate the educational video with the topics addressed in the classroom, helping to make the lesson more dynamic. Moreover, by reading informative texts, students can expand information about the contents of science.

Regardless of which didactic alternative the teacher will make use of, it should be borne in mind that any methodological resource should integrate the teacher's planning

before being applied in the classroom, to then fulfill the real goal of teaching that is to whet students' interest in learning.

In addition to attracting students' attention to the topic discussed in the classroom, the use of didactic strategies to teach science is considered an essential alternative to achieve important results in the students' understanding of the content taught, thus improving their learning.

As can be seen, there are several strategies available that facilitate the teaching of science. However, it is necessary to think, plan, and adapt these resources to the students' reality. The main goal is not to estimate among existing practices which are more important, but rather to understand how these can help the teacher in improving teaching quality.

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Notes

ⁱ Video link available in: <https://www.youtube.com/watch?v=RoQivJ14OdE>. Access in: 22 Aug. 2018.

ⁱⁱ Text available in: <http://mundoeducacao.bol.uol.com.br/curiosidades/por-que-riso-contagante.htm>. Access in: 22 Aug. 2018.

ⁱⁱⁱ Video link available in: <https://www.youtube.com/watch?v=IitW-UjitFQ>. Access in: 23 Aug. 2018.

