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The (In)Effectiveness of Educational Practices in Motivating 12th Grade Students in Biology Classes: The Case of Liceu do Xangongo, Angola

A(In)eficácia das práticas educativas na motivaçao dos alunos do 12º anon as aulas de biologia: o caso do liceu do Xangongo, Angolaçao

La (In)Eficacia de las Prácticas Educativas en la Motivación de los Alumnos de 12º Grado en las Clases de Biología: El Caso del Liceo de Xangongo, Angola

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ABSTRACT

The current study aimed to analyze the impact of teaching practices on student motivation in Biology classes at Liceu do Xangongo. This is a descriptive case study based on literature review, document analysis, as well as observation, interview, and questionnaire. The literature review revealed that motivation has been a subject of multidisciplinary interest, with significant contributions from psychology and pedagogy to educational practices. Two Biology classes were observed, one involving content exposition and another where students presented group work. In the observed classes, no adequate strategies were evident to reinforce student motivation to learn. For data triangulation, a questionnaire was administered to 40 students from the 12th grade of the Physical and Biological Sciences course, of which 80% claimed not to like the subject of Biology. Interviews were then conducted with the Biology teachers, one of whom is the coordinator of the subject. The data obtained from the observation in the 12th grade and the survey directed at the students and the interviews with the teachers and the pedagogical sub-director showed that the teaching practices at that school have been ineffective in motivating students to actively participate in classes. One of the causes of this ineffectiveness is the use of expository teaching methods in Biology classes and the lack of more sophisticated didactic resources.

Palavras-chave:
motivação, comportamentalismo, humanismo, teoria cognitivista, Aulas de Biologia.

RESUMO

O presente estudo tem como objetivo analisar a incidência das práticas docentes sobre a motivação dos alunos nas aulas de Biologia no Liceu do Xangongo. Trata-se de estudo de caso descritivo consubstanciado na revisão bibliográfica, análise documental bem como na observação, entrevista e questionário. A revisão bibliográfica permitiu constatar que a motivação tem sido tema de interesse multidisciplinar, com grandes

contribuições da psicologia e da pedagogia para as práticas educativas. Foram observadas duas aulas de Biologia, sendo uma de exposição de conteúdos e outra em que os alunos apresentavam trabalhos em grupo. Nas aulas observadas, não se evidenciou estratégias adequadas de reforço à motivação dos alunos para aprenderem. Para o cruzamento de dados, foi aplicado o questionário respondido por 40 alunos da 12ª classe do curso de Ciências Físicas e Biológicas, destes 80% alegou não gostar da disciplina de Biologia. Seguiu-se a aplicação das entrevistas às professoras da disciplina de Biologia, uma das quais coordenadora da disciplina. Os dados obtidos a partir da observação feita na 12ª classe e o inquérito dirigido aos alunos e a entrevista às professoras e ao subdiretor pedagógico permitiram constatar que as práticas docentes naquela escola têm sido pouco eficazes para motivar os alunos a participarem ativamente das aulas. Uma das causas dessa ineficácia identificada é a utilização de métodos de ensino expositivos nas aulas de Biologia e falta de recursos didáticos mais sofisticados.

RESUMEN

Palabras clave:
Motivación, conductismo, teoría cognitiva e clases de Biología.

El presente estudio tuvo como objetivo analizar la incidencia de las prácticas docentes sobre la motivación de los alumnos en las clases de Biología en el Liceo de Xangongo. Se trata de un estudio de caso descriptivo basado en la revisión bibliográfica, análisis documental, así como en la observación, entrevista y cuestionario. La revisión bibliográfica permitió constatar que la motivación ha sido un tema de interés multidisciplinario, con grandes contribuciones de la psicología y la pedagogía para las prácticas educativas. Se observaron dos clases de Biología, una de exposición de contenidos y otra en la que los alumnos presentaban trabajos en grupo. En las clases observadas, no se evidenciaron estrategias adecuadas para reforzar la motivación de los alumnos para aprender. Para el cruce de datos, se aplicó un cuestionario respondido por 40 alumnos de la 12ª clase del curso de Ciencias Físicas y Biológicas, de estos el 80% alegó no gustar de la asignatura de Biología. A continuación, se realizaron entrevistas a las profesoras de la asignatura de Biología, una de las cuales es coordinadora de la asignatura. Los datos obtenidos a partir de la observación realizada en la 12ª clase y la encuesta dirigida a los alumnos y las entrevistas a las profesoras y al subdirector pedagógico permitieron constatar que las prácticas docentes en esa escuela han sido poco efectivas para motivar a los alumnos a participar activamente en las clases. Una de las causas de esta ineficacia es la utilización de métodos de enseñanza expositivos en las clases de Biología y la falta de recursos didácticos más sofisticados.

Introduction

This article focuses on motivation as an important factor in student learning. Although the importance of motivation in the teaching-learning process is recognized, there are still educational practices whose teaching techniques and means have little impact on student motivation, and the results have been a lack of interest in studies, failure or even early school leaving.

The word motivation is present in everyday discourse, from informal to formal circles. We talk about motivation to achieve, motivation to overcome difficulties, motivation to succeed in almost every area, just as people need motivation to live. It's no coincidence that many people dedicate themselves to creating motivational content to encourage people who are facing difficulties or to inspire those who need light. What is motivation anyway?

Etymologically, the term motivation comes from the Latin "motivus", which means movement, and the suffix "tion", which indicates action, i.e. everything that drives human beings to act in one direction or another, with a view to achieving a certain end, a goal. Barajas et al. (2012) state that motivation refers to the causes that activate, guide and maintain human behavior for a certain period of time, once the subject identifies a goal as worthy of being achieved, and therefore makes an effort to do so.

Motivation is the set of psychological and physiological processes that lead an individual to act, that is, to trigger an action, to guide them towards certain goals (Mesquita &, Duarte, 1996, p. 145). It is the engine of action, capable of influencing behavior in any human activity, as well as establishing and maintaining emotional ties, social recognition and the individual's personal and social fulfillment.

The epistemological basis of motivation is based on psychological currents or theories, namely behaviorism, humanism and cognitivism. These theories seek to explain the process of motivation based on the principle that there is a need (motive) that triggers and guides human behavior (Eccheli, 2008).

Behaviorism focuses its study on observable conduct, neglecting any allusion to consciousness or any mental state. This psychological current is based on the idea that behavior is determined by environmental contingencies and motivation derives from the cues that provoke behavior and the reinforcements that maintain it. This current includes important research carried out by various scientists, including Thorndike and Skinner (cited in Baraja, et al., 2012). For example, in Skinner's theory, the most important factor in motivation is reinforcement or reward (Skinner, cited in Piletti, 2004).

Humanism emerged in the 1950s as a response to behaviorism, highlighting the vision of man as a unique and unrepeatable whole, with an intrinsically positive existential motivation that drives him to higher levels of achievement. In this current, human motivation is based on need, with an emphasis on conditioning mechanisms (Passanha et al., 2010).

Maslow, an advocate of humanistic psychology, carried out studies on self-actualization and established a hierarchy of human motivations. His theory includes two main concepts: basic needs (physiological and safety) and meta-needs (love, esteem and self-actualization). Maslow considered that man needs prestige, self-respect, justice and kindness as much as he needs food, sex and family stability. Human happiness results from the full satisfaction of basic needs and meta-needs (Maslow, cited in Mesquita & Duarte, 1996).

Unlike the previous ones, the cognitivist current assumes that each individual develops an interpretation of reality based on their own mental schemas and that the identification of goals and the disposition of personal resources of each individual cannot

be generalized to others, since each person develops different expectations of achievement and values goals differently (Barajas et al., 2012).

To illustrate, Rotter's (1954) cognitivist theory considers behavior to be the result of "the individual's needs and the expectation that this behavior will lead to their satisfaction" (cited in Mesquita & Duarte, 1996, p. 145). In this current, motivation is approached taking into account the individuality of man as a subject capable of identifying and knowing reality and projecting himself towards personal fulfillment. Thus, the individual seeks to set goals and understand their own behavior, and interprets phenomena arising from the environment according to mental schemas (Passanha et al., 2012).

Generally speaking, a person is motivated when they are predisposed and excited to carry out a certain action and persistently aim for a certain goal. It is because people are motivated that they engage in their activities, enjoy what they do, face challenges and overcome obstacles.

Vygotsky (1926), in his work Pedagogical Psychology, brought to light aspects inherent in motivation by emphasizing the impact of the student's interest in the educational process. For him, all teaching must be based on taking the exact interests of children into account and school activity must coincide with the needs of the pupil.

Thus, in the school context, motivation has direct implications for the quality of teaching, which is why its importance has gained prominence in educational research. Various studies have been carried out on this subject, including the following authors: Bueno (2002); Oliveira & Alves (2005); Fernandes (2009); Lourenço & Paiva (2010); Ribeiro (2011); Perassinoto et al. (2013); António (2014); Sabino (2023). Alongside these authors, we have selected some definitions, presented below.

From a pedagogical point of view, “motivation consists of offering students the incentives and stimuli that make learning more effective” (Piletti, 2004, p. 233). Based on this quote, it can be seen that the teacher must be skilled enough to make the right choice and offer what can really stimulate the student to learn effectively. Effective learning can be that which has some meaning for the learner and uses the knowledge learned in real-life situations. This requires the promotion of "frequent practice spaces (learning by doing) and environments rich in opportunities" (Bacich & Moran, 2017, p. 38).

From this perspective, the teacher must identify, select and apply strategies that encourage students to learn in a meaningful way. And this idea is corroborated by Ecchili (2008, p. 2) who says that "motivation in the classroom has to do with "the process of encouragement designed to predispose students to learning and to making efforts to achieve certain goals".

However, there are still teachers who think that motivating students is simply a matter of telling them anecdotes and jokes to make them laugh. This practice can be ineffective, as students may prefer the jokes to the content of the subject or prefer to spend the whole lesson laughing rather than developing cognitive skills which, in a way, are part of the teaching-learning process. And there are teachers who, because they can't get their students' attention or keep them quiet during the lesson, as if quietness were synonymous with learning, tend to start punishing their students.

In view of the above, Vygotsky (1926) calls attention to educators who try to motivate students by telling anecdotes, because, according to him, this attitude can arouse the student's interest in the anecdote itself and not in the subject of study. He also criticized teachers who use punishment or prizes to get the student's attention, because, as well as being detrimental to learning, it makes the student pretend to be attentive and strive to please the teacher, without actually understanding what is being taught.

Considering that school is a place of peace, tolerance and inclusion, punishment is unacceptable at school and should therefore be avoided.

Therefore, we rely on the contributions of the humanist current because it considers human needs to be a source of motivation, which is why the preparation of teaching activities must take into account the real needs of the students, try to understand the students' desires, cognitive conflicts and curiosities in relation to the contents of the subject to be taught.

Motivating is considered to be predisposing the student to learn the content easily, effectively and with satisfaction, in other words, to whet and maintain their "appetite" for knowledge. Motivation aims to arouse the student's attention to the subject to be learned and captivate their intellect in order to facilitate the acquisition, assimilation and construction of knowledge. Thus, motivating is not about telling jokes or performing comedy in the classroom (which some teachers do), but about getting students to recognize education as a vital necessity. Furthermore, it is important to innovate, to explore other resources that make the classroom an attractive space for students to learn meaningfully.

However, the teacher must be skilled enough to know the class he or she is working with in order to adopt strategies that motivate students not only to get high marks in exams, but also to be able to criticize, judge and rework knowledge. Lemos (1996 cited in Passanha et al., 2010) highlights the importance of fostering environments that encourage student initiative, getting them involved in decisions and not just waiting for everything to be said and decided by the teacher. It is believed that when students are open, they can be more engaged in the activities and can even accept new and different challenges, making the process of seeking new knowledge a meaningful activity.

In fact, respecting the students' curiosity and knowing how to listen to them is fundamental, since it frees the student and makes them more able to express their thoughts, bringing them closer to the object being taught, on the one hand; on the other, it facilitates the teacher's work and, moreover, favors participatory learning. And this is important because "listening to students' opinions and suggestions creates a sense of change and, consequently, motivation" (Antunes, 2018, p. 65). And it's important for the teacher to pay attention to the real needs of the students, which can be done through frank dialog and a dose of teacher sensitivity.

Sensitivity and open dialog can open up space for each student to express their ideas and opinions, allowing teachers to tailor their lesson plans to their students' needs, which is an important factor in motivating them to learn. According to Martins (2007 cited in Sabino, 2023, p. 13), "motivation is really fundamental to better student learning, as it creates the desire to achieve high performance".

In the opinion of Freire (1996, p. 33), "the construction or production of knowledge of the object implies the exercise of curiosity, its critical capacity about the object under study, to observe it, to delimit it or to make its methodical approach, its capacity to compare, to ask questions". In this sense, in the classroom it is important for the teacher to allow the student to express themselves, to ask questions and this can help to ensure that, depending on the content being taught, the teacher can motivate the student to learn consistently, rather than presenting them with ready-made content that has no relation to the cognitive needs of the subject of learning. It follows that the distance between what the student is curious about and the subject matter presented solely by the teacher can make educational practice ineffective in increasing student motivation and promoting effective learning.

The ineffectiveness of motivation in the teaching-learning process is a recurring obstacle in many classes (Sabino, 2023), especially in subjects where teachers find it

difficult to relate the content they teach to students' interests and needs. This can cause some students to devote little time to their studies, to be passive, uninterested or inattentive during class, and this, as well as making it difficult to understand, leads to apathy towards knowledge and school failure.

In fact, if the student doesn't want to learn, the teacher loses the opportunity to teach and his or her efforts are in vain, as they don't achieve the educational objectives. In order for students to study, they have to be motivated, which means reducing motivational blockages (limiting themselves to explaining everything, not relating the subject matter to the student's daily life), in order to adopt procedures by which it is possible to encourage the student not only to be in the classroom, but also to learn with satisfaction.

The subject of Biology is unique in that it is the object of study. On the one hand, it studies living organisms and natural systems, as well as the processes and laws that govern their development and stability. On the other hand, it studies the objects and phenomena that distinguish the levels of organization of living matter and their relationship with nature (António, 2010). For this reason, it is essential that the teacher adopts effective techniques and procedures so that students have the predisposition to grasp concepts, laws and principles and, at the same time, have the possibility of using this knowledge for their personal, professional and social fulfillment.

In the light of Law No. 17/16, of October 7, which governs the Angolan Education and Teaching System (Angola, 2016), the II Cycle of General Secondary Education is structured into three classes: 10th, 11th and 12th. In the case of the area of Physical and Biological Sciences, the subject of Biology includes the following thematic units: Plant and Animal Anatomy and Physiology, Genetics, Evolution and Systematics and topics related to the environment. In the same cycle of education, the content of Biology follows on from the knowledge students have acquired in previous classes, in the subjects of Environmental Studies, Nature Sciences (in Primary Education) and Biology (in the 1st Cycle of Secondary Education).

There are 18 general objectives for this cycle of education, among which the 13th objective stands out: "Developing group work, autonomy and a love of learning". (INADE, 2013, p. 6). In the second cycle of secondary education in Angola, the Physical and Biological Sciences course was conceived as the basis for higher education in engineering, medicine, biological sciences, higher nursing, etc. Biology is taught from 10th to 12th grade, alongside other subjects.

Based on the assumption that the subject of Biology is central to the Physical and Biological Sciences Course in the Second Cycle of General Secondary Education in Angola, it is thought that for students to learn it is necessary for the teacher to be creative in order to combine the available resources with teaching methods and procedures and thus create and/or recreate conditions that motivate the student to study, not only to pass the class, but also to acquire knowledge, develop skills and competencies based on socially useful and edifying values, attitudes and conduct. However, educational practice in our schools is different.

In this perspective, this study seeks to analyze the impact of educational practices on student motivation in Biology classes, carried out at the Xangongo High School located in the municipality of Ombadja in the province of Cunene in Angola. And the specific objectives: (i) to identify the factors that interfere with student motivation during Biology lessons; (ii) to describe the teaching resources available at the school to ensure Biology lessons; (iii) to verify the impact of educational practices on student motivation in Biology lessons at Liceu do Xangongo.

Method

Due to the complexity of the problem, we opted for a descriptive case study. According to Yin (2015, p. 244), this type of study aims to "describe a case in its real context". To this end, various procedures were used, as a way of engendering a more holistic view of the object of study, considering the multiple dimensions of motivation and learning. From a procedural point of view, the literature review, document analysis, observation, questionnaire and interview were useful.

Study participants

Grade 12 students and two Biology teachers from the Physical and Biological Sciences course at the school in question took part in the research. The students were mostly teenagers and young people, aged between 16 and 25, living in Xangongo, although there were some who came from the surrounding areas. The sample was made up intentionally of the 40 students enrolled in the 12th grade, a single class. In terms of gender, there were 17 males and 23 females, aged between 18 and 25.

The biology teachers were between 34 and 36 years old. The subject coordinator, the youngest, at the time had a degree in Biology Teaching and had been teaching for over 10 years. The other had completed her 4th year of higher education in the same subject, also with 10 years' experience. Alongside the two teachers, the institution's Deputy Pedagogical Director, a computer engineer, whose age he did not reveal, also took part in the study.

We opted for purposive sampling because this type of sampling made it possible to enrich the information for the theoretical foundation of the research, based on pragmatic and theoretical criteria about motivation (Aires, 2011).

Procedures

The literature review was used to approach the subject from the pioneering studies to the most recent ones, based on an analysis of the theories of various authors (Marconi & Lakatos, 2010) theories of various authors (Marconi & Lakatos, 2010). This method made it possible to identify a vast amount of literature on motivation and learning from the point of view of psychology and didactics. Alongside the literature review, the documentary analysis allowed us to analyze important documents in the education sector, such as the current educational legislation in Angola, the biology syllabus and the curriculum of the Physical and Biological Sciences course (Aires, 2011).

Direct observation, a procedure that allows the researcher to come into contact with the phenomenon being studied, was applied to the observation of two 12th grade Biology classes, in order to ascertain the motivational situation in Biology classes at the aforementioned school. Direct observation is useful because it reinforces the "source of evidence for conducting case study research" (Yin, 2015, p. 118).

A questionnaire is a data instrument consisting of a series of ordered questions" [...] (Marconi & Lakatos, 2010, p. 184). The questionnaire was given to the students of the 12th Physical and Biological Sciences class and to the Biology teachers at the same school, who answered the questions, allowing the data collected during the observation to be cross-referenced with the information provided by the teachers.

The interview is one of the "most important sources for the case study" (Yin, 2015, p. 114). For this research, short case interviews were used in three different sessions. First, the biology teacher was interviewed before the lessons were observed, followed by the Deputy Pedagogical Director of Liceu do Xangongo. The procedure made it possible to

obtain pragmatic information about motivation and its relationship with learning and its impact in biology classes.

Inductive method. The logic of this method consists of starting from particular cases to the general (Marconi, & Lakatos, 2010). Once the findings had been made in the field, the data collected was analyzed in the light of the theories on the subject, in a bottom-up connection that made it possible to identify the gap between practice and theory.

The data collected through the selected instruments was interpreted from a hermeneutic-interpretative perspective, based on the assumption that hermeneutics is an intellectual process that allows "capturing the form and meaning of human communication" (Carvalho, 2009, p.105).

The school is located in the village of Xangongo, the seat of the Ombadja municipality, in the Deolinda Rodrigues neighborhood, adjacent to the road that connects the municipal seat with the town of Calueque. It's a school with two floors, 24 classrooms, two offices, one for the principal and one for the assistant principal. It also has a teaching office, two general offices and a teachers' room. The school also has running water and electricity. There are private ones for teachers of both sexes, and private ones for students, respectively. It is a school whose imposing architecture and operation make it a benchmark in the municipality.

The school operates in three periods: morning, afternoon and evening. It has a vast team of professionals, from teachers to administrative staff. Teachers are trained in a variety of areas, from bachelors and graduates in educational sciences, such as Biology, Chemistry, Physics, Mathematics, Psychology, Philosophy, Portuguese Language, and non-educational courses, such as Law, Computer Science. Quantitatively, the school's human resources are shown in the table below. Table 1 summarizes the data on the number of teachers, administrative staff and guards at the school.

Table 1

Human Resources at Liceu do Xangongo

TEACHERS AND NON-TEACHING STAFF	FM	F	MINIMUM AGE	MAXIMUM AGE
Total number of teachers	37	10	26 years old	50 years
Total administrative staff	10	4	26 years old	55 years old
Other staff (guards)	1			32 years old

Note. Taken over from the Administrative Board of the Liceu do Xangongo.

As for the rooms available, the school has no functioning biology, chemistry or physics laboratories, only two computer labs equipped with computers and Internet access, as shown in Table 2. Alongside these rooms, a school library is available to the institution's students and teachers, as shown on the following page.

Table 2

Compartments available for research

TITLE	QUANTITY	DESCRIPTION
Library	1	Two reading rooms
Computer lab	2	Computers with internet access

Biology Laboratory
Physics and Chemistry

Note. Taken over from the Administrative Board of the Liceu do Xangongo.

Results

Two Biology classes were observed in the 12th grade at Xangongo High School, with the aim of finding out how and by what means the teacher motivates her students to learn Biology content.

In the 12th grade, there were the minimum conditions such as a blackboard, marker board and the necessary lighting to visualize surrounding objects, as well as the required ventilation.

It was a lesson on invertebrate animals. As a means of teaching, the teacher brought some animals into the classroom, such as porifera (river sponges), molluscs (snails and mussels) and arthropods (cockroaches).

In the beginning, the teacher paid little attention to motivational aspects, because instead of asking the students if they had any questions or curiosities to share, she began by summarizing the previous lesson. And surprisingly, the teacher tried to use joking words to make her students laugh, perhaps in order to cheer up the class.

As for the presentation of the content, the teacher was the only one to speak and didn't give the students a chance to ask questions, and even if they were interested in asking, there was little openness, especially in the first half of the lesson. In the same lesson, distortion of the content was also noted during the explanation. For example, the teacher went so far as to say that "animals are autotrophic beings, which produce their own food", but forgot that this is the characteristic of some types of bacteria, all algae and plants.

There are two possible causes for this: on the one hand, the teacher's negligence could be at the root of this misconception, i.e. the fact that she has been teaching for over a decade may have meant that she didn't plan the lesson properly. On the other hand, the presence of an observer might have hindered her thinking and blocked her memory at the time, even though she had been informed about the visit in advance.

Another aspect to emphasize is that the teacher encouraged her students to study for the test and not to gain knowledge, and she even said: "You have to pay attention to what I'm saying, because it's going to be on the test, and anyone who doesn't answer well will fail."

It's clear from the above that students only have to learn what they're taught in order to be able to answer the tests, otherwise they run the risk of failing. In fact, this doesn't motivate students to deepen their knowledge or expand their horizons, but rather to study in order to pass. Considering the test as an instrument for assessing learning, it is advisable that it (the test) "helps to motivate students to learn with understanding and to give them an account of their progress and successes, but also of their failures and difficulties" (Fernandes, 2008, p. 93). Therefore, asking students to study to pass makes them limited and blocks their intellect. That's why there are so many graduates, but no skills.

As with the first lesson, we also observed another lesson with a different format. They were no longer simple lectures. In this class, the students presented their work in groups in front of their classmates and it was evaluated by the class. This lesson was useful if we consider that motivation can be triggered by diversifying the strategies used by teachers.

In this class, the students seemed withdrawn and unmotivated. As final-year students, it was expected that they would be more participative as this was a class in which they would be presenting work they had supposedly done themselves, and would have the opportunity to demonstrate the skills they had acquired over the three years. But the opposite was happening.

For example, one of the students was talking about reproduction in animals and couldn't explain external fertilization. In order to clear up the doubt, the teacher gave an example of the fertilization of tomato plants (*Lycopersicum esculentum*) as a type of external fertilization. You forgot that the question was about external fertilization in animals, not plants.

Now, while the teacher was presenting the incorrect answers, the students were restless, unconvinced, and some were whispering among themselves, perhaps because they had noticed the teacher's slip, realized the confusion. In this class, the psychodynamic aspects were absent.

However, direct observation has its limitations, as the individual being observed may simulate behavior or feel it difficult to behave naturally, which can distort the interpretation of the data (Marconi & Lakatos, 2010).

In order to cross-check the data, a questionnaire was administered to students in the 12th grade of the Physical and Biological Sciences course at the institution in question. The questionnaire addressed to Grade 12 students aimed to assess whether the students were motivated in Biology classes. The 12th grade was chosen for the survey, as they are the school's final-year students and best represent the profile of the biology teaching-learning process inherent in that educational institution.

The 40 students in the 12th grade took part in the student questionnaire. The first question aimed to find out which of the subjects in the Physical and Biological Sciences course was the students' favorite. For this question, only 8 students, corresponding to 20%, claimed to like Biology, and 32 students, 80%, prefer other subjects in grade 12.

These data corroborate the results of the studies carried out by Ndatemapo (2014), in his end-of-course work, in a sample of 32 students from the 1st Cycle, only 7 students, that is, 22% of the students said they liked the subject of Biology. In the same year, António, in a sample of 36 primary school students, only 17% of the students surveyed thought they liked this subject.

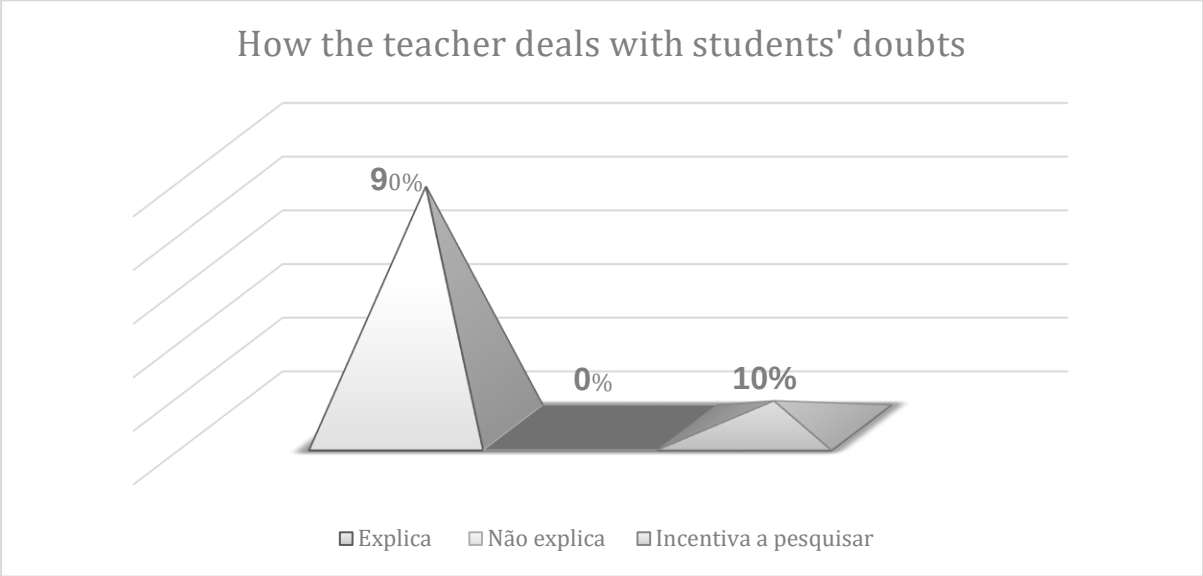
Question 2 asked whether students felt motivated in Biology classes, and 40 students answered that they felt motivated in Biology classes, which corresponds to 100% of the students surveyed. However, this data contrasts with the answer to the first question, as the students claimed not to like the subject of Biology, but said they felt motivated in Biology classes.

This was followed by another question aimed at checking how the teacher motivates the students, so 90% of the students (36 students) considered that they were motivated when the teacher talked about the importance of the subject, and 4 students, or 10%, felt motivated by anecdotes. This response corroborates the initial idea, which was that the students' motivation in the classroom did not consist of telling jokes or making jokes during the lesson, but of convincing the students of the importance and usefulness of the content and the subject in everyday life.

Based on the idea that the student should be the active subject of learning and that the teacher should encourage research, we asked how the teacher deals with the students' doubts, as shown in graph 1. 36 students said that the teacher explains, and 4 students said that the teacher encourages research.

Graph 1

How the teacher deals with students' doubts during biology lessons

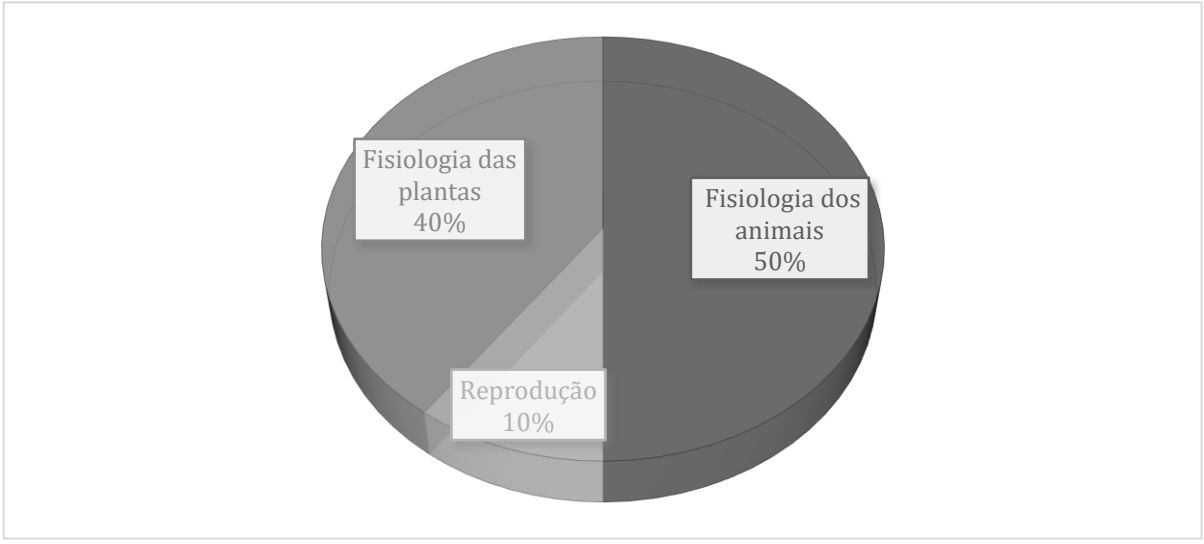


Graph 1 shows that students are hardly encouraged to do research, but are instead offered ready-made truths, which makes the lesson one-sided and the student passive. In Piaget's (1998) view, hollow verbalism, as the main educational tool, hinders the student's understanding.

The students were also asked which subject they most enjoyed learning in Biology, from 10th to 12th grade, and they showed a preference for the subjects in the last grade. The results of this question are summarized in Graph 2. This question was important because it aimed to understand the impact of teaching practices on students' learning throughout the training process.

Graph 2

Topics that students most enjoyed learning about in Biology lessons



Graph 2 shows that the students liked the 12th grade subjects exclusively, with the highest percentage (50%) for the II and III Quarter subjects "Animal Physiology", while for "Plant Physiology", the I Quarter subject, the percentage was 40%.

In order to ascertain the students' level of understanding of the themes, they were asked to justify why they liked the selected theme. One of the students said he enjoyed studying "Plant Physiology" because "In hormonal coordination I like to know what glands a being has and where we come from". Another student explained: "Because he tells us about everything and how it happens during his phase."

Although the students said they liked the topics in grade 12 better, they had difficulty justifying it, which shows the inadequacy of the teaching methods used in biology classes at that school. This shows that the explanatory errors observed during biology lessons have some impact on the understanding of the content.

Therefore, the analysis of the answers given by the 12th graders raised the following questions: What is the teacher's opinion of the students' motivation?

First, the teacher whose class was the first to be observed was interviewed. The first question was: What do you think about motivation in the teaching-learning process?

In response, the teacher highlighted several aspects, culminating in what she considers to be motivation: "motivation is a construct that refers to the momentary directing of thought, attention and action towards a goal". It's clear from the answer that the teacher has some information about motivation.

The teacher was then asked if her students felt motivated during the lesson, and the answer was "yes" and then "sometimes". The justification for this answer was that students aren't always motivated and it doesn't just depend on the teacher.

To the question of how the teacher has motivated her students, she responded by emphasizing the importance of the topic during the lesson. However, this response is at odds with what was observed in the 12th grade class, because during the observation we didn't see any concern to explain the relevance of the topic in order to motivate the students. This revealed a contradiction between what happens in educational practice and what the teacher thinks about motivation. This question aimed to identify the factors that interfere with students' motivation. The teacher spoke up: "When you don't achieve the objective of the lesson, the social and economic conditions". And on the factors that contribute to student motivation, the answer was as follows: "when the teacher achieves the goal of the lesson for the student".

From this response, it can be understood that ignorance of the factors that strengthen motivation may be the reason for not applying strategies or actions that contribute to motivating students.

They were also asked what other factors influence student motivation. The teacher highlighted the subject's curriculum as a factor and the explanation was: "Because the Biology Curriculum must respond to the needs and interests of the educational scene in order to meet the expectations of the government (the quality of teaching)."

The previous questions were also asked of the second teacher interviewed, who was observed to be the subject coordinator at the time. For her, motivation is "a set of motives that manifest and influence an individual's behavior", and she considered the factors that demotivate students to be "social and economic conditions and lack of interest". As for the factors that contribute to student motivation, she highlighted "good performance, greater interest in the subject".

Coincidentally, he also emphasized that the biology curriculum should be adaptable to the reality of the educational setting and respond to the needs and interests of each student. He explained that this would be in line with the government's expectations in the field of training for staff in the discipline of Biology.

In order to gather relevant data on the concept and the factors that contribute to or interfere with motivation, the interviewee said that motivation has to do with "the teachers' sense of direction, the teachers' teaching materials and availability, and the classroom conditions to arouse the students' desire to acquire the knowledge of a subject".

With regard to the factors that contribute to student motivation, the Deputy Pedagogical Director considered it important to improve infrastructure, adopt teaching resources and train teachers to teach easily.

Regarding the adequacy of the programs to meet the needs and interests of the student, the interviewee replied: "reviewing the programs, which involves reviewing and evaluating them and adjusting them to the needs of the present time. This requires a sense of responsibility and more commitment on the part of everyone involved in the teaching-education process."

The idea of reviewing the curriculum and adjusting it to local needs has been advocated by several authors. In order to provide quality teaching and prevent the erosion of the education system, it is essential to reduce bureaucracy in curricula (Carvalho et al., 2006). Fagundes et al. (1999), for example, suggest adopting a curriculum for each student, i.e. individualized curricula, because students are not the same and each student has their own learning style. The above idea is supported by Bacich & Moran (2018, p. 45) in their approach to "personalized learning based on the student's life project".

Discussion and conclusions

The observations showed that the teachers are aware of the concept of motivation, but find it difficult to operationalize lessons in which it would be possible to apply strategies or procedures that would really motivate the students in Biology lessons, and this was seen in the use of jokes or jocular scenes to make the students laugh, as if this were a guarantee of motivation to learn the contents of the Biology subject.

As this paper argues, motivating is not about comedy. It's about connecting the psychodynamic aspects of the students with the content being taught, it's about engaging the students to take an active part in the lesson and, above all, it's about provoking their intelligence to learn in a meaningful way. Students should not learn content without knowing why and what to learn it for.

In the interview, the lack of adequate teaching resources, the correct selection of teaching methods and the affective relationship between teacher and student were not mentioned by the teachers surveyed. This situation is worrying, given that solving a problem requires identifying and knowing its cause. In other words, in order to motivate students, it is essential to know the factors that hinder motivation and every motivational strategy must be based on these factors.

According to the survey, there is a need to motivate students, because only 20% of them like biology and if they don't like it, they hardly feel motivated to learn. After all, why do 80% of students dislike the subject of Biology?

It is assumed that students dislike the subject of biology because they have little opportunity to question, doubt and debate the content. As they are limited to taking notes and remaining passive in class, they don't cultivate a taste for the subject. In our opinion,

students should have more opportunity to ask questions, reflect and look for solutions, and the teacher should stimulate and guide the class. Because learning is directed at the student, it is the student who learns. The student must be the protagonist of their learning.

Learning should encourage changes in behavior, attitude and enrich problem-solving skills, i.e. students should not only acquire knowledge, but also change their behavior, and more than learning, it is important that learning has relevance for the learner. When learning, there must be a difference between the moment before and the moment after, so the student must be able to face new challenges, solve concrete problems and, in a substantive way, enrich their experience. However, this difference must be qualitative, because it's not important to clutter the student's memory with vain information, without it having any meaning for them, and the accumulation of knowledge is useless if the individual doesn't change their behavior and attitude.

The arguments presented from the first chapter to the discussion of the results have led to conclusions from both a theoretical and practical point of view. Thus, the review and analysis of the literature on motivation in the school environment suggests that it is a determining factor in the quality of the teaching-learning process, since sufficiently motivated students actively participate in class.

In conclusion, both the observation of the classes and the data collected from the interviews with the teachers and the deputy head teacher, as well as the questionnaire to the students, indicate that the poor motivation of the students in Biology classes is the result of the following factors: (i) the exclusive use of expository methods, which results in passive learning; (ii) the lack of initiative on the part of teachers to adopt appropriate strategies to arouse students' interest and curiosity during Biology lessons; (iii) the lack of a laboratory for this subject in order to guarantee the relationship between theory and practice and encourage the active participation of students in the construction of knowledge, developing in them a spirit of research; and (iv) the difficulty of enriching teaching activities with activities that give students more of a leading role, in which each student has the opportunity to express their thoughts, disagree and express curiosity about the content they are being asked to learn.

Nowadays, it is important for schools to look for innovative aspects in the teaching-learning process, in the sense that teachers can incorporate pedagogical strategies that favor student protagonism and promote active learning (Camargo & Daros, 2018).

Since the inefficiency of motivation is a barrier present in Biology classes, we suggest that further studies be carried out on the subject in other educational institutions to identify the factors that interfere with motivation. Also investigate the influence of the teacher's motivation as one of the actors in the teaching-learning process, in order to gain a deeper insight into the case and provide a meaningful intervention.

For this intervention to be effective and efficient, it is important:

- Consider carrying out a longitudinal study to follow the evolution of student motivation over time, allowing for a more comprehensive analysis and the identification of possible changes or trends.

- Providing opportunities for students themselves to actively participate in the process of improving educational practices, encouraging dialog and collaboration between students and teachers.

- Find volunteer teams (made up of psychologists, pedagogues, psychopedagogues and others) who can help in the process of improving the school.

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