

Environment and technologies: a didactic sequence developed with teaching practices for full-time high school education

ARTICLE

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Abstract

The present work sought to develop a pedagogical tool, through a didactic sequence, with the purpose of contributing to the knowledge of Competence 9 in Portuguese Language and Literature classes for the senior high school students at Escola Estadual Dr. Ulysses Guimarães, (PA). The proposal aims not only to explore environmental themes, but also to recognize Competence 9 in the proposed questions, through the intertextuality of the garbage theme, which presents a reflection on facts and subjects that remain up to date today. Thus, when thinking about the issue, this didactic sequence was set up, divided into sequential study modules, to apply knowledge of the aforementioned competence and contribute with repertoires for the ENEM essay regarding the theme of Sustainable Development and how it interferes with information technology.

Keywords: Full-time High School. Portuguese Language. Information Technology. Sustainable Development. Didactic Sequence.

Meio ambiente e tecnologias: uma sequência didática desenvolvida com práticas docentes para o Ensino Médio Integral

Resumo

O presente trabalho buscou desenvolver uma ferramenta pedagógica, por meio de uma sequência didática, com a finalidade de contribuir ao conhecimento da Competência 9 nas aulas de Língua Portuguesa e suas Literaturas dos terceiros anos do Ensino Médio Integral da Escola Estadual Dr. Ulysses Guimarães, (PA). A proposta visa não só a explorar as temáticas do meio ambiente, mas também a reconhecer a Competência 9 nas questões propostas, por meio da intertextualidade da temática do lixo, que apresenta uma reflexão sobre fatos e assuntos que se mantêm atualizados nos dias de hoje. Desse modo, ao pensar a questão da problemática, montou-se essa sequência didática, dividida em módulos de estudos sequenciais, para aplicar conhecimentos da referida competência e contribuir com repertórios para a Redação do Enem a respeito da temática do Desenvolvimento sustentável e como ela interfere na tecnologia da informação.

Palavras-chave: Ensino Médio Integral. Língua Portuguesa. Tecnologia da Informação. Desenvolvimento Sustentável. Sequência Didática.

1 Introduction

Nowadays, the school environment has been influenced by a number of factors, especially new technologies. As a result, there was a need to relate Competence 9, described in the ENEM Reference Matrix, to the themes of the workshops given, since this competence represents the individual's ability to:

understand the principles, nature, function and impact of communication and information technologies in their personal and social life, in the development of knowledge, associating it with scientific knowledge and the languages that support them (Brasil, INEP, 2023).

Knowledge has become increasingly accessible due to the expansion of knowledge, mainly through digital media (Brasil, 1998). The Base Nacional Comum Curricular (BNCC, 2018) also highlights the construction of knowledge and know-how in social practices based on the use of digital technologies. This evidence is explicit in the description of General Competence 5:

Understand, use and create digital information and communication technologies in a critical, meaningful, reflective and ethical way in various social practices (including school practices) in order to communicate, access and disseminate information, produce knowledge, solve problems and exercise leadership and authorship in personal and collective life (BNCC, 2018).

Students arrive at school with a knowledge of the world guaranteed by their experiences, social media and other technological means. Therefore, the student cannot be perceived as “a blank canvas, a blank sheet of paper”, in the words of Paulo Freire (1987). So how can we make teaching practice more attractive, while at the same time taking into account students' prior knowledge and making them actors in the construction of their own learning?

To this end, Geraldi (1984) argues that students should enjoy reading. In addition, the author also reiterates that students' textual production cannot be presented for correction alone, as this practice does not encourage the formation of new readers and writers.

It is known that, through the history of the educational process in public schools, effective methodologies are needed for students to achieve meaningful learning. According to Freire's (2011) studies, the teacher's job is not just to teach content, but to teach students to think in the right way, with understanding, because knowledge cannot be transferred, but can be shared, also recognizing the experiences that each subject carries.

Considering Freire's conceptions, teaching practice should promote the insertion of dynamic activities that are contextualized with the students' experiences and that arouse interest so that they feel motivated, dialogue and build their knowledge. Therefore, teachers need to promote teaching based on more effective practices that can facilitate the resolution of activities with the textual genre and explanatory tables, in order to stimulate the construction of knowledge.

It is therefore necessary to use the new digital technologies to understand problems in various areas of knowledge, especially the difficulties based on the ENEM Reference Matrix, within the scope of Competence 9. But for this to happen, we need a curriculum, teacher training and investment in technological infrastructure in schools, to make teaching and the use of new technologies a reality in state secondary schools.

2 Methodology

The method used for the research took place in two distinct stages. The first was the theoretical development of the theme of Competence 9 based on the ENEM Matrix. For this reasoning, we consulted curriculum documents and books on topics directly related to the use of technology. The second stage was to apply the technique developed in the Portuguese Language/Literature subject. The practice was developed with the senior full-time high school students in Portuguese language classes at the EEEFM Dr. Ulysses Guimarães, Belém do Pará, PA. The didactic sequence developed was inserted into the program content of the mediating teacher, respecting the bases (curricular matrices).

In all, 100 students were involved, approximately 33 from each class, with an average age of 17. The students were encouraged both by debates and motivational

explanatory videos from the regular class teacher and by the undergraduate student (mediator) throughout the application. The evaluation and analysis of the stages (during the application) was done through dialogues and virtual meetings. The works received were evaluated according to the specific skills and competences of the Matriz de Referência de Linguagens, Códigos e suas Tecnologias – Competência de área 9 (H28, H29 e H30), BNCC, Linguagens e suas Tecnologias do Ensino Médio.

To collect the data, a mock test was administered that addressed some of the competences in the ENEM Matrix (Competences 1, 5, 6, 7, 8 and 9), with 10 (ten) objective questions related to the competences.

As Nóvoa (2009) rightly points out, the teacher is a component that cannot be replaced in the teaching and learning process and must be able to create the means for students to develop and build new knowledge. Therefore, practices that allow discursive interactions in the classroom, associated with everyday scientific knowledge, can promote the construction of new knowledge, and the teacher is the mediator of this system by introducing techniques aimed at improving the formulation of ideas and problem solving by the students.

3 Results and Discussion

For Freire (2011), educational practice is not neutral, but political, since, as well as involving pre-established content, it emphasizes the ideas, dreams and values of the subjects involved. It is essential that the teacher maintains a balanced approach, avoiding underestimating or overestimating the students. Therefore, it is the teacher's duty to construct activities that encourage students to develop their concepts, skills and attitudes, proposing problems for investigation, dialoguing through examples from everyday life, which will result in new knowledge.

3.1 Development and Structure of the Didactic Sequence – Modules

For students to be successful in studying these skills, internalizing concepts and knowing how to apply them in the practice of solving questions or writing essays, it is necessary to understand that the Portuguese language has the possibility of converging with other areas of knowledge, especially with regard to textual interpretation. In addition, in relation to Competence 9, which deals with information technology, this practice can be linked to the construction of the BNCC by addressing ICT, required in various instances, such as: interviews, seminar presentations, hearings, tests, debates, among other spaces that require the use of this relationship.

Module 1 – In-person class: Presentation on the problem of garbage in debate: an interdisciplinary look at the socio-environmental problem of improper disposal. By recognizing the function and social impact of the different communication and information technologies, students should be able to analyze the new technologies and, above all, the impact they have on everyday life, in the professional and personal spheres. The focus is to understand how the students see the social changes generated by them, as well as to ascertain their critical position on the subject. In this way, documentaries, music and images are elements that can show the reality of how the planet is, the causes and consequences of its problems.

Thus, the students can understand the impact of communication and information technologies on personal and social life, the development of knowledge, production processes and problem-solving. For example, in industry (automation); commerce (management); the investment sector (simultaneous information, immediate communication); education (learning, distance learning).

Module 2 – With this theme in mind, an excerpt from the documentary “Lixo Extraordinário” (2010) will be presented, showing the work of Brazilian artist Vik Muniz, who portrays the lives of waste pickers who use the Jardim Gramacho landfill, in the city of Duque de Caxias (RJ), as a source of income. The documentary reflects on the problem of social inequality and the environmental impact caused by the improper disposal of solid waste. It also addresses social, environmental and artistic issues related to waste and

recycling, showing how art can transform the reality of people marginalized by society and contribute to raising awareness about the problem of waste in the world.

The display of this theme consists of issues experienced by society. Through the video genre, it is proposed to address the self-destructive behavior of human beings, which harms nature, a source of essential resources for survival, for the sake of greed. In this interaction of destruction, the consequences of not cooperating with the environment are gradually being experienced.

Suggestion for accessing ICT: Link to the documentary excerpt (required):

https://www.youtu.be/_pyR9qCd2F8

Module 3 – Debate and discussion on the environmental issues presented in the video on garbage, socio-environmental problems and the improper disposal of different types of garbage.

Module 4 – After the reflections, the students will form pairs to answer a quick quiz (excerpted below) on just one cell phone with internet access. The questions are about sustainable consumption in their daily lives.

“Quick quiz: To get you started, we invite you to test your ecological footprint! Through an analysis of food, housing, personal goods, services, consumption and transportation, you discover how your habits impact the planet and how each choice can contribute to a positive change in the world we live in.”

Suggestion for accessing ICT: Link to the quiz on sustainable consumption (required): <http://www.suapegadaecologica.com.br/>

Module 5 – The students will carry out the activity in class, consisting of 10 (ten) questions on the subject presented. The questions were based on the themes presented on the environment and information technology, and were analyzed according to the Matriz de Referência de Linguagens, Códigos e suas Tecnologias – Competência de área 9 (H28, H29 e H30). The evaluation will be based on the correction of the proposed activity, when it will be verified whether or not the students understand the theme requested for discussion, correlating it with what has been exposed and debated.

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Module 6 – Closing: Recap of the most relevant points, as well as the development of the activity. What were the difficulties, the challenges, especially when using the app and seeing the test on sustainable consumption? What changes in behavior can students make after this practice? This conclusion is in line with the initial objective, which was to promote reflection on the subject, and the inclusion of the use of information technology in Portuguese language classes, especially when students have a full day of classes. It is therefore important that the perceptions of the students involved are understood and interpreted, allowing them to make sense of the learning process and the use of information technology tools.

3.2 Application of the Didactic Sequence

We have selected 10 (ten) questions from Competence 9 of ENEM. Table 1 shows their main characteristics:

Table 1 – Competence 9 questions				
Question	Skills	Text used	Competence	
1	28	Expository- -argumentative text on the advance of new technologies.	Competence 9	H28 – Recognize the function and social impact of the different communication and information technologies.
2	4	Expository- -argumentative text on the treatment of garbage.	Competence 1	H4 – Recognize critical positions on the social uses made of languages and communication and information systems.

3	17	Argumentative text on environmental discussions.	Competence 4	H17 – Analyze factors that explain the impact of new technologies on the process of territorialization of production.
4	29	Argumentative text on the impact of new technologies on society.	Competence 9	H29 – Identify communication and information technologies by analyzing their languages.
5	29	Argumentative text on the impact of new technologies on society.	Competence 9	H29 – Identify communication and information technologies by analyzing their languages.
6	30	Expository-argumentative text on the context of new information and communication technologies.	Competence 9	H30 – Relate communication and information technologies to the development of and the knowledge they produce.
7	28	Argumentative text on the impact of new technologies on society.	Competence 6	H28 – Relate the use of technologies to socio-environmental impacts in different historical and geographical contexts.
8	28	Expository-argumentative text on sustainable consumption.	Competence 6	H28 – Relate the use of technologies to socio-environmental impacts in different historical and geographical contexts.

9	14	Expository- -argumentative text on the change in behavior in today's world.	Competence 3	H14 – Comparing different points of view in analytical and interpretative texts.
10	19	Injunctive text giving tips on how to have a good quality of life away from urban areas.	Competence 4	H19 – Recognize the technical and technological transformations that determine the various use and appropriation of rural and urban spaces.

Source: Authors (2023).

3.3 Test with the students

In order to evaluate the knowledge of students in the senior high school classes in the 2023 school year, ten (10) questions were selected addressing the Competences (1, 3, 4, 6 and 9) and the Skills (4, 14, 17, 19, 28, 29 and 30) of the ENEM Matriz de Referência de Linguagens, Códigos e suas Tecnologias and the Matriz de Referência de Ciências Humanas e suas Tecnologias. In this way, we selected those that would be in line with the proposal presented in the didactic sequence. We categorized the questions based on their thematic content. Finally, the test was as follows:

Table 2 – Thematic content of the selected questions

Questions	Competences and skills required	Thematic content
1	C9H28	Different communication and information technologies
2	C1H4	Contexts in which information technology is applied

3	C4H17	Impact of new technologies
4	C9H29	Analysis of languages in information technologies
5	C9H29	Analysis of languages in information technologies
6	C9H30	Relating information technologies to the development of societies
7	C6H28	Relate the use of technologies to socio-environmental impacts in different contexts
8	C6H28	Relate the use of technologies to socio-environmental impacts in different contexts
9	C3H14	Comparing points of view in analytical and interpretative texts
10	C4H19	Recognize technological changes

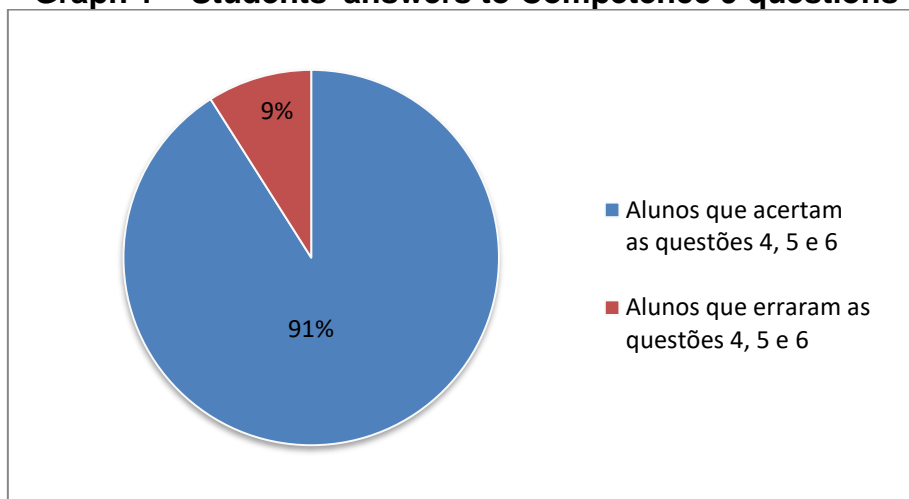
Source: Authors (2023).

It is important to note that all the questions test competences and skills from Competence 9 – Matriz de Referência de Linguagens, Códigos e suas Tecnologias and Matriz de Referência de Ciências Humanas e suas Tecnologias and there is also a text in all of them that deals with information and communication technology, which will serve as a reason for evaluating high school students' learning. In addition, when we selected the questions, we analyzed each one separately to evaluate a particular ENEM Matrix for Competence 9 – Information Technology, making it easier to evaluate the errors and successes of each student, solving these difficulties when correcting them.

The integrated activity was applied to 100 senior high school students at the end of 2023, in the classroom, without consulting the content and without access to cell phones. When analyzing the results, we noticed that the students performed well on some questions, including question 4, which refers to competence and skill (C9H29); question 5,

which refers to competence and skill (C9H29); and question 6, referring to competence and skill (C9H30), both presented earlier. Compared to the other questions, these were more difficult to solve. Of the 100 students, 91% got them right:

Graph 1 – Students' answers to Competence 9 questions



Source: Authors (2023).

At the end of the research, comments, suggestions and criticisms were left open for the students to give their opinion on the experience of developing the practice of teaching. In general, they enjoyed taking part in the didactic sequence, although some pointed out a certain degree of difficulty:

It was a bit of an effort to take the test, because I don't have access to the internet and because I don't have a cell phone, but after taking it in pairs with another colleague who did have a cell phone, it was dynamic and fun, proving that all the effort was worth it.

They commented on the support materials and praised the slide: “*The materials presented and shared are interactive and were sufficient to develop the activity*”. Another comment: “*In relation to the information technology proposal, it was very interesting to relate it to the environment, as we had a lot of difficulty solving the questions in the*

diagnostic evaluation that the teacher gave us.” In short, they demonstrated enriching learning, autonomously expressing their knowledge of the didactic sequence presented.

This teaching and learning proposal is based on sequences of activities, which facilitate a joint educational process between teacher and student and are defined as:

[...] a set of coordinated, structured and articulated activities for the achievement of certain educational objectives, which have a beginning and an ending known to both teachers and students (Zabala, 1998, p. 18).

In this way, a text has several readings, and the school ends up showing naive practices by reproducing a view of the student as passive in the face of these linguistic choices. Understanding language as interaction enables methodologies that are effective for the student when they take into account the social learning that the student has.

4 Conclusions

By introducing teaching practices, with targeted activities, with the implementation of interesting dynamics, it is possible to stimulate creativity and student interaction. With the application of the didactic sequence, it is understood that the new technologies, especially the digital ones, precisely in the ENEM questions, evaluate their implications in society and the changes in behavior with their use.

With this, we can highlight the importance of group socialization, as the students began to exchange experiences, for example, about the problem of garbage (what are the consequences, what problems could be solved), with the aim of bringing a positive meaning to the apprehension of this content, correcting and reducing such difficulties.

When the activity was corrected, we had a significant result and this makes us think that using new digital technologies to solve problems in various areas can be used in any discipline and area of knowledge.

In this way, teachers and schools can use these pedagogical tools in the classroom, although we have limitations in teacher training and in the structural conditions

of schools throughout the country. We need curriculum, teacher training and investment in technological infrastructure in schools to make the teaching and use of new technologies a reality in basic education.

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