


Elaboration of interactive didactic material for the discipline of inorganic chemistry

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ABSTRACT

Addressing the growth of higher education requires addressing dropout, which harms students and the quality of the education system. Thus, the overall objective of the project is to create innovative teaching materials to teach inorganic chemistry. The project is carried out in stages, such as: search for the menu, bibliographic research and formulation of ideas, finally, seeking feedback from students. Which confirmed the importance of investing in interactive teaching materials adapted to the needs of students.

Keywords: Chemistry, Inorganic, Material, Teaching.

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INTRODUCTION

In the Brazilian context, by focusing on reducing dropout in higher education, the project stands out as an educational approach that involves students in the learning process, recognizing that dropout should not be seen only as a definitive dropout, but as a complex phenomenon that requires exploration and discussion to guide the management of educational institutions (SENGER; DALLAGO, 2020). In the last two decades, higher education in Brazil has experienced remarkable growth in several dimensions, driven by programs such as REUNI and PROUNI, which have resulted in new public policies and investments in infrastructure (Da Silva et al., 2022). However, it is essential to address dropout as a fundamental challenge when facing the growth of higher education, whether in public or private institutions, as highlighted by Vasconcelos, Almeida and Monteiro (2009, p. 458).

Upon entering Higher Education, students are endowed with a series of intentions and objectives that define the level and type of education and professional future they aspire to for themselves. These intentions can be translated into a greater or lesser commitment to the achievement of certain educational objectives (such as, for example, obtaining a degree) or to the achievement of these objectives in a particular educational institution – a commitment of a more institutional nature.

To combat dropout in higher education, it is crucial to implement innovative strategies and provide academic support in institutions. According to data from the MEC-INEP Higher Education Census, in 2021, the dropout rate reached 9.4% in public institutions, resulting in the loss of 165 thousand students (MEC-INEP Higher Education Census, 2022). This program seeks to create innovative and effective teaching materials for the discipline of Inorganic Chemistry, aiming to improve teaching and learning. The main focus is to provide an engaging learning experience that stimulates curiosity, critical thinking, and challenge solving, contributing to the improvement of students' performance in this area and promoting new approaches in the dissemination of knowledge.

MATERIALS AND METHODS

The main objective of this project is to create didactic resources aimed at improving the teaching and learning of the discipline of Inorganic Chemistry, also including the concepts covered in the discipline of General Chemistry I. To achieve this purpose, the project will be structured in several stages:

- a) Survey of the syllabus of the discipline of Inorganic Chemistry and the contents to be addressed.
- b) Conducting a bibliographic research in scientific articles related to each chapter of the content, in order to support the creation of didactic materials.
- c) Elaboration of a script that describes the topics of each chapter, serving as a basis for the

production of didactic materials.

- d) Precise planning, including dates and times, for the execution of each project-related activity.
- e) Application of teaching materials in the classroom. And application of a questionnaire to find out the students' opinion about the resource.

RESULTS AND DISCUSSION

Alternative teaching in higher education plays a crucial role in promoting inclusive and dynamic education by adopting flexible and innovative teaching methods that adjust to students' different learning styles and interests. This creates a stimulating and engaging environment, which is essential to combat the high drop-off rate, as revealed in a survey (Christo et al., 2018, p. 163), which indicated a dropout rate of 86% among engineering students in the first periods. This focus aligned with Faria's (2001) vision of education as a continuous and comprehensive process, the project was applied in the Materials Engineering course, class of 2023, with classes on Fridays, from 2 pm to 5 pm (Image 1).

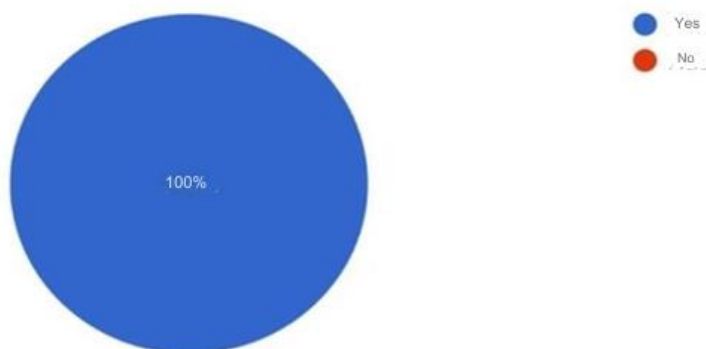
Image 1 - Inorganic Chemistry lesson.



Source: Author, 2023.

A Forms was applied to find out what the students thought about using the virtual game Kahoot in the classes of the subject. The students of the inorganic chemistry discipline, materials engineering 2023, answered the questions "Do you like the virtual game, Kahoot in class?" and "Can you learn better with this resource (Kahoot)?", where inside the classroom the students seemed excited about the game and participated. The answers of these students (Graph 1) were positive:

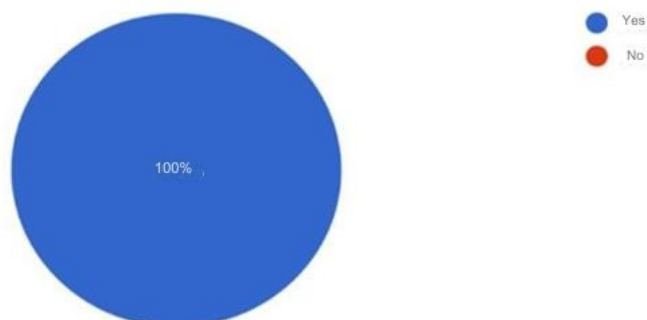
Graph 1- Percentage of "yes" or "no" answers, Forms.
Do you like the virtual game, Kahoot in class?



Source: Author, 2023.

The students answered and 100% of the answers were "yes", stating that they liked the game. The second question (Graph 2) had the following percentage:

Graph 2- Percentage of "yes" or "no" answers, Forms.
Can you learn better with this resource (Kahoot)?



Source: Author, 2023.

All the answers to whether the students learned better from Kahoot were positive. In addition, two students: student X1 and student X2, gave their written opinion about the resource used, organized in Table 1:

Table 1 - Students' opinion regarding the game

Student X1- "It's a way of not being in that situation where only the teacher is talking and the student listens It's more didactic and interactive."
Student X2- "A diversified teaching methodology can stimulate learning."

Source: Author, 2023.

The opinions highlight that the method is different and promising. In this way, the program should evolve within the academic scope, seeking more students, as one of the ideas against student dropout in the initial semesters. In addition to improving the quality of teaching with new



methodologies.

FINAL THOUGHTS

The ongoing effects of the Covid-19 pandemic are still noticeable in the educational field, making the integration of students who come from a remote education system a critical issue to ensure their continuity at the university. The results of the program to create alternative teaching resources for the discipline of Inorganic Chemistry have been highly promising in the classroom, presenting itself as an effective solution to the challenge of student retention.

These developed materials have demonstrated positive impacts, evidenced by the improvement in students' understanding and interest in the content of the discipline, which has made the more dynamic and attractive learning process. In addition, the use of these resources has fostered greater interaction between students and knowledge, facilitating the assimilation of Inorganic Chemistry concepts. The intent is to share these materials with other educators and make them available in all future courses in the discipline as the project is completed. This not only benefits the students on our course, but also provides incentives to reduce student dropout, amplifying the positive impact on teaching.



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