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Analysis of the implementation of the Organic Chemistry Teaching Program in the Agricultural and Livestock course in Technical and Professional Education. Case study Polytechnic Institute of Nhamatanda (ADPP Lamego)

Analysis of the implementation of the Organic Chemistry Teaching Program in the Agricultur course in Professional Technical Education.Case studyNhamatandaPolytechnicInstitute (ADPP Laaamego

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Summary
The research aims to analyze the implementation of the organic chemistry teaching program in the aforementioned course at the institute. Whether they meet the minimum requirements of a teaching program and are suitable for the aforementioned course or not, since it haspurpose of training professional technicians at secondary level.For its materialization, the author used the following methodology: Bibliographic research, where the author read and analyzed books, scientific monographs, articles related to the topic under study. Document analysis: this technique consisted of analyzing the teaching program of the organic chemistry discipline specifically in the following aspects: objectives, contents, its connection with other disciplines, sequence, available teaching time, methodological orientation, experimental activities. Interview which consisted of interviewing the coordinator of the course that includes the organic chemistry discipline with the objective of understanding if he has the program, recruitment method and the profile of trainers to teach this discipline. After the analysis and collection of data, the results showed that most of the observed aspects are not clear, such as Contents, Logical sequence, Evaluation, Bibliography. Despite the high level of existence of the aforementioned aspects, it allowed to conclude that the Organic Chemistry teaching program in the aforementioned course of the institution, reasonably meets the minimum requirements demanded of a chemistry teaching program and is suitable for the aforementioned course. However, it was recommended that the module of the same program of the aforementioned course be updated and specific, incorporating experimental activities, learning methodologies and teaching resources.

Keywords:program, chemistry, agriculture.

ABSTRACT

The research aims to analyze the organic chemistry teaching program in the institute's aforementioned course. Whether they meet the minimum requirements of a teaching program and whether they are suitable for the course or not, given that it aims to train professional technicians at a secondary level. For its materialization, the author used the following methodological procedures: Bibliographical research, where the author read and analyzed books, scientific monographs, articles linked to the topic under study. Direct observation, this technique consisted of analyzing the teaching program for the subject of organic chemistry specifically in the following aspects: objectives, contents, its connection with other subjects, sequence, available teaching time, methodological guidance, experimental activities. Interview which consisted of interviewing the coordinator of the course that covers the discipline of organic chemistry with the aim of understanding whether he has the program, recruitment method and trainer profile to teach this discipline. After analysis and data collection, the results showed that most of the aspects observed are not clear, such as Contents, Logical Sequence, As-
session, Bibliography, despite the high level of existence of the aforementioned aspects, allowing us to
Concluding that the teaching program of Organic Chemistry in said institution's course, reasonably meets
the minimum requirements required for a chemistry teaching program and is suitable for said course.
However, it was recommended that the module of the same program as the aforementioned course be updated and specific, incorporating experimental activities, learning methodologies and teaching resources.
Keywords:program, chemistry, agriculture.

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1. INTRODUCTION

According to Figueiredo (2020), a teaching program serves as an essential guide for teaching activity, ensuring that all necessary components are present: objectives, content, its connection with other sciences, logical sequence, teaching time, methodological guidance, evaluation and bibliography. He also emphasizes the importance of a well-structured program, especially in technical courses, such as Agriculture, due to the need for a solid foundation in subjects such as Organic Chemistry.

A teaching program, according to Perrenoud (2020), consists of detailing the curriculum according to the specific needs or situations of the school, the classroom and the student.

In order to teach the subject of organic chemistry in vocational technical education in the province of Sofala, teacher/trainer training is provided with a thematic plan extracted from the vocational technical education training program with insufficiencies in the basic components of a teaching program.

This research arises due to the lack of research at the level of the Chemistry course at UL – Beira that specifically address the analysis of chemistry programs in technical-professional education as well as the fact that there is a greater number of institutions for training professional technicians in the province of Sofala whose quality of chemistry teaching programs is unknown.

This time, we sought to analyze the implementation of the Organic Chemistry teaching program to understand whether it meets the requirements of a teaching program, so that the training of Agro-Chemistry technicians - Livestock of the institute under study is effective.

2. THEORETICAL BASIS

In this chapter, the author, through bibliographical research, provides a description or justification of the theme “teaching programs”, to find out how other authors approach the same subject. Some authors use the terms: “teaching planning”, “teaching plan”, “subject program” and “thematic program”; therefore, in this work the term “teaching program” will be used, in order to adapt the language used in Mozambique.

2.1. Concepts

According to Figueiredo (2020), a teaching program is the planning of pedagogical activities and consists of translating educational objectives into concrete actions carried out in the classroom. To Moura (2020), a teaching program is an essential document, serving both as an action plan for the teacher and as an administrative and didactic-pedagogical instrument.

According to Nunes (2022), the teaching program is a broader and more general “planning” of the discipline. plina in the course. The teaching program is a reflective practice that allows the teacher to constantly adjust his/her work (Quadros, 2020).

2.2. Purpose of Teaching Programs

The development of a teaching program aims to facilitate the monitoring of pedagogical planning. gogical, according to Santos and Oliveira (2021). A well-structured program provides greater security to the teacher and clarity to the students, in addition to avoiding improvisation and repetition of content.

2.3. Characteristics of a Teaching Program

A teaching program has some particular characteristics, different from other programs/plans, which are:

- Objectivity and realism – every plan, regardless of what it is, must be objective, real and applicable, otherwise it becomes unfeasible and unenforceable. The objective, in turn, must be real and based on a concrete action.
- Functionality – the teaching program as the guiding tool for teaching work, It must be functional and easy to understand and apply by the teacher and the student, since they are the main actors in the program. This is the secret to ensuring that the teaching program has didactic value, ease, and structuring the PEA.
- Simplicity – consistent with the two aspects described above, the teaching program must be simple, viable and easy to understand, be careful not to use terms that may have a double meaning and cause confusion, as this will make implementation difficult. Menegolla (sd) cited in portal educação3, reinforces that, “when planning, try to avoid any and all tendencies towards complexity or pedagogical refinement”; “we must start from the instruments we have at hand, that is, the school reality, seeking, through our own schemes and styles, the simplicity of school planning, even when dealing with complex, tangled and profound subjects”.
- Flexibility – for the teaching program to be real, objective and simple, it is necessary that the The teacher leaves room for possible readaptation or reorganization, that is, he structures it in a flexible way and not in a rigid or inflexible way.

The teacher needs to have sensitivity and wisdom to perceive when the PEA is taking a different direction than initially planned and to adapt the appropriate changes.

- Usefulness – a teaching program must be useful and meaningful to the PEA characters. It must have a pedagogical basis that directly meets the demands of the students to whom the disciplinary planning is intended.

Therefore, it is essential that the teacher chooses content that is truly consistent with the proposed objectives, aligned with an inter and multidisciplinary vision, aiming at the integration of concepts and consistency in the construction of learning.

2.4. Teaching Program, Curriculum and Lesson Plan

For Moura (2020), the teaching program consists of detailing the curriculum according to the specific needs of the school, the classroom and the students. This planning is crucial to ensure the connection between the program content and the skills to be developed by the students.

2.5. STRUCTURE OF THE TEACHING PROGRAM

Collaborative teaching, as described by Capellini and Zerbato (2019), highlights that the construction of teaching plans should involve different educational actors, enabling teachers and students, together with coordinators, to contribute to the planning process to create a richer and more inclusive learning experience. This collaboration allows the needs and perspectives of all involved to be considered.
are incorporated into the content, promoting a more effective and dynamic learning environment.

A current approach to structuring teaching programs involves close collaboration ta between teachers, students and managers.

2.6. WHO SHOULD DEVELOP THE TEACHING PROGRAM?

Structuring teaching programs involves close collaboration between teachers, students

and managers. Collaborative teaching, described by Capellini and Zerbato (2019), highlights that the construction of teaching plans must involve different educational actors, allowing teachers and students, together with coordinators, to contribute to the planning process to create a richer and more inclusive learning experience. This collaboration allows the needs and perspectives of all involved to be incorporated into the content, promoting a more effective and dynamic learning environment.

Furthermore, the National Common Curricular Base (BNCC) reinforces the importance of the program being adapted at the state and municipal level, with an emphasis on specific skills and abilities, rather than just traditional content. This structure allows for greater flexibility and more practical application, tailored to the needs of each educational context.

The development of the curriculum is a collaborative process and should involve both teachers and students, as well as the school's teaching staff. The teacher usually initiates the planning process, considering the curriculum objectives and the needs of his/her students. However, to ensure that the curriculum is inclusive and appropriate to the school context, this planning should be discussed and adjusted together with other teachers and teaching staff in the school, allowing for the incorporation of different perspectives and expertise.

According to Capellini and Zerbato (2019), the practice of collaborative teaching is also fundamental in this process. In this approach, teachers from different disciplines or specialties work together to plan and implement strategies that meet the diversity of students. Collaboration between educators allows for continuous adjustments to the teaching program, adapting it to the needs of students and promoting inclusive and adapted education.

2.7.CONCEPTS OF SOME COMPONENTS OF THE STRUCTURE OF THE EDUCATION PROGRAM

Summary–from the Latin ementum, which means thought or idea; it is a type of record that highlights the essential points about a given subject; it is like a summary or synopsis, in the case of a disciplinary syllabus, it points out the key points of the subject to be presented during the academic year (Nunes, s/d). The syllabus cannot be changed without being approved by the course coordinator.

Learning Objectives– are fundamental to guide the course content and activities, and must be aligned with the desired skills. These objectives must be clear and measurable to facilitate the evaluation process (Capellini and Zerbato, 2019)

Program Content– The content must be well structured and distributed, ensuring a logical progression of the topics covered. According to recent guidelines, such as the BNCC, it is important that the content is updated and relevant, connecting with the context and interests of the students (Brazil, 2018)

Teaching Methodologies–Teaching strategies should be active and diverse, including methodologies that promote student participation and engagement. Recommended methods include the use of practical activities, case studies and group discussions, which aid in active learning (Capellini and Zerbato, 2019).

Assessment-Assessment should be continuous and formative, allowing the teacher to monitor students' progress throughout the course. Diverse assessments, such as projects, tests and practical activities, are essential to verify whether the objectives have been achieved (UNIRIO, 2020)

Schedule and Organization– A clear schedule allows the organization of content and activities, facilitating the monitoring of learning and the achievement of objectives at each stage of the course (Start Educação, 2020)

3.METHODOLOGY

Search type

This is documentary research, as it uses documents, records and archives as the main source. of data where for this research work is the teaching program.

To materialize this research, the author used the following methodological procedures: **Bibliographic research**– establishes the theoretical basis necessary for the research. It involves the collection, analysis and interpretation of information contained in relevant documents and publications on the topic

of interest.

According to Ocaña-Fernández and Fuster-Guillén (2021), bibliographic research allows not only reviewing existing literature, but also offers a new perspective on the topic, contributing to the formulation of hypotheses and the development of more in-depth knowledge on the subject investigated.

This type of research is essential from the beginning of a project, as it helps the researcher to delimit the topic, identify gaps in knowledge and theoretically support their research. Furthermore, the quality of bibliographic research can directly impact the results and validity of the research carried out, making it a crucial step in the scientific research process (Ocaña-Fernández and Fuster-Guillén, 2021; Sousa et al., 2021).

Document analysis– is a research methodology that focuses on the examination and interpretation of documents to extract information relevant to a given research problem. It involves a systematic process that allows us to understand the content of documents and their relationship to the historical and social context.

According to Lima Júnior et al. (2021), documentary analysis seeks to identify and understand the content of documents, using technical and scientific procedures that facilitate the obtaining of significant information for research. This methodology is particularly useful in qualitative research, where researchers can explore different types of documents, from written texts to audiovisual records, thus expanding the understanding of the object of study.

The interview– is a data collection technique used in qualitative research, characterized by the interaction between the researcher and the interviewee. According to Pinho and Pires (2021), the interview can be structured, semi-structured or free, depending on the degree of rigidity of the questions and the space for open answers. This method is especially valuable in educational contexts, where the aim is to understand the per-

perceptions, experiences and feelings of the participants.

Table 1: Observation results of the Organic Chemistry discipline

Discipline	observed aspect	I.Existence		II. Level of Clarity		III. Relationship Content/course
		Yes	No	Of course	ñ/clear	
Chemical Organic	1.menu		X	____	____	Existing
	2.Objectives	X		X		
	3.Contents	X			X	
	3.1. Connection with other disciplines	X		X		
	3.2. Sequence	X			X	
	4.Time lectivedis- available	X		X		
	5. Orientation met- odological	X		X	____	
	6. Teaching resources		X	____	____	
	7. Evaluation	X			X	
	8.Bibliography	X			X	
	9.Experimental activities mentals	X			X	

Source:(TOMOCENE, 2021)

Presentation and discussion of interview results

The following are the results of the interview conducted at the Polytechnic Institute of Nhamatanda. It should be noted that the course coordinator was interviewed. (See the script in Annex II).

It should also be noted that the aforementioned Polytechnic Institute of Nhamatanda is private. The interview conducted provided the results that are presented below.

1. How long have you been running the course?

Answer: I have been running the course for 2 years.

2. Which chemistry subjects are part of the course?

Answer: There are no specific subjects, but rather modules that integrate Organic Chemistry content. The modules are: “Soil Fertility Management and Plant Nutrition” and “Principles of Integrated Pest, Disease and Weed Management”.

3. Do these subjects have teaching programs, especially for Organic Chemistry?

Answer: Yes, there is a teaching program.

3.1. If yes, who developed the teaching programs? Answer: The programs were developed by NEP/Fornece. 3.1.1. Do you believe that the teaching program is appropriate for the course? Answer: Yes, the program is appropriate for the course.

3.2. If not, do you think it is correct that the program does not exist? Comment.

Answer: I don't think it's correct. Without a teaching program, activities don't follow guidelines, making the program essential as a guide that facilitates teaching activities.

4. How do you recruit chemistry teachers at your institution?

Answer: As a public and private institution, recruitment takes place through public competitions published when necessary.

5. Do the recruited teachers have training in teaching chemistry or are they from other areas? Answer: They do not have specific training in chemistry, but rather in other areas, such as agriculture and livestock.

laugh.

6. Have you had meetings with other institutes to discuss the Organic Chemistry program that is taught?

Answer: Yes, I have already had meetings with the IAC and ADPP Nacala. 6.1. If so, what were the main findings of these meetings?

Answer: Key findings include the process of competency-based training (CBT), as well as knowledge, attitudes and skills, and how to improve the sharing of information and teaching materials.

6.1.1. Where are these findings forwarded?

Answer: They are forwarded to the current Secretariat of Technical and Professional Education. 6.2. If not, do you think it is necessary to hold these meetings?

Answer: (Answer not provided, please add if available.)

7. Do you have any suggestions for improving the existing chemistry teaching programs in this area? institution?

Answer: (Answer not provided, please add if available.)

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