Exsiccates in Botanical Education: Prior Knowledge and Experiences

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ABSTRACT

In the teaching of botany, it is essential to adopt pedagogical approaches that consider the students' daily lives and their prior knowledge about the plants present in their region. With the aim of making the study of botany more engaging and collaborative, this work proposed the creation of herbarium specimens as a methodological alternative. Herbarium specimens are samples of plants that are collected, pressed, and dehydrated, used by botanists for studies on the morphology and classification of plants. We believe that the use of herbarium specimens can enrich the teaching of botany, bringing it closer to the students' reality. This study was conducted in the biology course at CEPI Dr. Mauá Cavalcante Sávio. Regarding the data collection method, the research was experimental, using a questionnaire for data collection. The analysis of the responses obtained in the questionnaire revealed that the majority of students found the teaching of botany more attractive and understandable when collaborative activities, such as the production of herbarium specimens, were proposed. This demonstrates that the theoretical-practical approach, which allows students to apply what they have learned in the collection and preparation of botanical samples, is highly effective. Therefore, we can conclude that the more contextualized and participatory the teaching process is, the closer we will be to providing meaningful learning.

Keywords: botany; herbarium specimens; plants.

INTRODUCTION

Botany is a field of Biology that studies, groups, and classifies plants based on their characteristics. Although it is a science with great historical relevance due to human interaction with plants over time, Botany is generally treated with disinterest by both teachers and students. (URSI et al., 2018).

SILVA, et al (2019) highlights that the quality of Botany education is crucial for raising awareness about environmental and climatic issues, as well as providing a fundamental basis for the training of new researchers. However, often the teaching of Botany is done in a way that is disconnected from the students' reality, using traditional, expository, and theoretical methods that do not engage the students.

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According to Bizzo (2002), field classes come as an alternative to improve the teaching of Botany, as students interact with plants in nature.

The presented research aimed to make the teaching of Botany more attractive and collaborative, proposing the creation of herbarium specimens as a teaching tool for the 2nd Year High School students at the Full-Time Education Center (CEPI) Dr. Mauá Cavalcante Sávio. The expectation is that this approach will allow students to become more familiar with the local flora, while simultaneously teaching botanical concepts in a more engaging manner.

METHODOLOGY

The research conducted was of the experimental type with qualitative and quantitative variables, focusing on the area of botany education. It was conducted at the Full-Time Education Center (CEPI) Dr. Mauá Cavalcante Sávio located in the municipality of Anápolis, Goiás. The research was conducted with the participation of 50 students enrolled in the 2nd year of high school.

At first, the students were instructed about the objectives and the importance of herbarium specimens. During this explanation, the students were introduced to the purpose of herbarium specimens, which goes beyond the simple collection of plants. It was highlighted that herbarium specimens are a valuable tool for the study of botany, allowing for the precise documentation of the morphological characteristics of plants and their scientific identification. Furthermore, it was emphasized how they contribute to the preservation of botanical knowledge over time, allowing scientists and researchers to reveal patterns and trends in local and global flora.

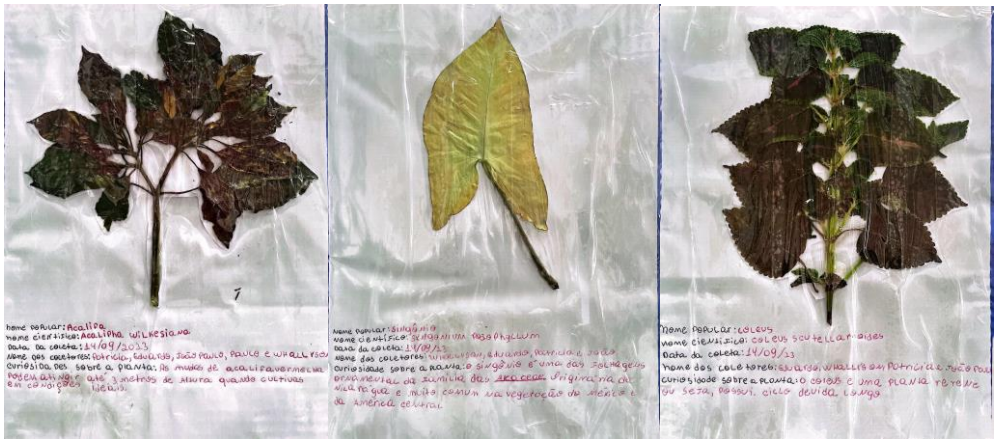
After the students' instruction in the classroom, a field class was conducted in which the students collected specimens from different botanical groups within the school unit as shown in figure 1.

Figure 1. Construction of the exsiccata

Source: Author's Own

The collected specimens were carefully pressed, dehydrated, mounted on A4 sheets, and to properly identify the plant specimens, the students created labels containing relevant information, such as the collector's name, collection date, scientific name, common name, and relevant curiosities (see Image 2).

Figure 2. Prepared exsiccates



Source: Author's Own

The exsiccata generated throughout the research were carefully stored in the institution's Science Laboratory and, in the following weeks, played a fundamental role as an educational resource in Biology classes.

Finally, to evaluate the application of the methodology, a questionnaire with 5 questions was conducted to understand how the students engaged in the activity and if they perceived positive results regarding the completion of the tasks.

RESULTS

The findings of this research reveal a very positive reception from the students regarding the teaching of botany through the preparation of herbarium specimens, as illustrated by the responses provided in the questionnaire. One of the students expressed that "The construction of herbarium sheets helps with the taxonomic information of plants" (Student A1), indicating that this practical and engaging approach sparked their intrinsic interest in the subject.

Furthermore, the same student emphasized that the botany classes were not limited to the traditional monotony of copying notes or performing tedious activities, but were characterized by a remarkable dynamism and productivity, stating that "The mode of learning becomes broader and more dynamic." these reflect These responses reflect the noticeable change in students' attitudes towards learning botany when the methodology becomes more practical and engaging. The production of herbarium specimens not only motivated them to learn but also provided a more dynamic and productive learning experience, making the subject more accessible and meaningful to them. This aspect emphasizes the importance of innovative pedagogical approaches that not only convey information but also inspire students' curiosity and motivation. The questionnaire revealed valuable insights that deserve a more in-depth analysis. In the first question, which explored the students' perception of the importance of producing exsiccates, we noted that a significant percentage, 100% of the students, defined the process as being of high relevance. In the second question of the questionnaire, 93.34% of them agreed that the production of herbarium specimens significantly facilitates the recognition of the plant structures studied during theoretical botany classes.

When asked about When asked whether the construction of herbarium sheets aided in the understanding of the topics studied in class, it was notable that all the students, that is, 100% of them, responded affirmatively, highlighting the substantial contribution of this approach to the learning process. The students' responses highlighted that direct interaction with plant specimens during the class was highly facilitative. This is because, by handling and studying the herbarium specimens, the

students could analyze the plant structures in a more detailed and meticulous way than through images or representations in the classroom. perhaps revealed that The present research revealed that the use of differentiated pedagogical approaches plays a significant role in promoting students' interest in botany education. The combination of theoretical and practical instruction enabled the creation of more dynamic, engaging, and collaborative classes, bringing students closer to the subject under study. Therefore, the proposal of producing herbarium specimens as a teaching tool for botany in schools has proven effective in stimulating student engagement and participation. They showed that, when encouraged by differentiated pedagogical approaches and practical experiences, students are able to recognize the relevance of this approach for their learning. In all questions, more than 90% of the participants recognized the construction of herbarium sheets as a valuable process for their learning and expressed interest in studying botany again through differentiated methodologies. The data highlight the importance of understanding the reality of education and the need to introduce new teaching tools, re-evaluate traditional methods, and rethink teaching practices with a focus on improving the quality of education.

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