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THE USE OF MEDIA IN BIOLOGY EDUCATION IN PUBLIC AND PRIVATE SCHOOLS

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Abstrak

Biology learning media are an absolute necessity in the teaching and learning process. A biology teacher must be able to select biology learning media that are appropriate for the concepts to be conveyed and can support the success of the teaching and learning process in public and private schools. In biology learning, particularly the concept of biodiversity, biology teachers must be able to provide students with an understanding and introduction to various types of plants, including herbs. Utilizing the diversity of plants found in nature is one of the most appropriate solutions for biology teachers to achieve more optimal learning outcomes. The success of learning, particularly in the field of biology, which can be seen from three aspects—knowledge, attitude, and skills—is expected to be achieved if the role of biology teachers as educators can guide students during field trips to identify plants.

Kata kunci: Knowledge, Attitude, and Skills in Biology Learning

INTRODUCTION

Learning is a process that takes place through both formal and non-formal education. In formal education, educators and students are required to be more creative in order to achieve the desired educational goals. An educator must be able to master the appropriate methods and media selection in teaching. Improvements in student performance each semester are related to several factors, which are broadly categorized into two groups: internal factors and external factors. Internal factors include health, intelligence, talent, interest, motivation, and learning style. External factors include family, the quality of biology teachers, teaching methods, and the alignment of the curriculum with students' abilities. school facilities/equipment, classroom conditions, number of students per class, community, surrounding environment, and others. Both factors simultaneously influence student learning achievement. For example, a student with good intelligence may not necessarily master the learning material if their interest and motivation toward learning are low, and conversely, a student with average intelligence may improve their mastery of the learning material due to high interest and motivation. Thus, interest and motivation are important factors that directly influence students' academic performance. The interest and motivation that students already possess can still be influenced by external factors. These include, among others, the way biology teachers teach, the media used, and the classroom environment. Wibawa and Mukti state that verbalism, confusion of meaning, and inaccurate perceptions can reduce students' interest and motivation, thereby affecting their academic achievement.

The use of appropriate media in biology education is one solution to various issues related to

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students' interest and motivation in learning. The use of appropriate media can enhance students' attention to the topic being studied. With the help of media, students' interest and motivation can be increased, leading to greater concentration and, it is hoped, an improved learning process learning becomes better so that ultimately student achievement can be improved. Therefore, the use of media as a learning aid must be chosen appropriately and must truly help students understand the material being presented. Thus, it is hoped that it will be able to stimulate the development of students' cognitive, affective, and psychomotor aspects. In biology education at Junior High School and Senior High School, the concept of biodiversity is one of the topics that must be taught to students. In accordance with the 2004 curriculum, the basic competencies to be achieved are that students are able to apply their understanding of the importance of biodiversity and plant classification, as well as apply the principles of grouping living organisms to study biodiversity for life. Biodiversity is the diversity of organisms that reflects the total variation of genes, species, and ecosystems in a given area. The diversity of plants in general, and herbaceous plants in particular, found in nature is one of the natural media that can be used as a learning medium in conveying material on this concept. Herbaceous plants are one type of plant that can be distinguished from other plant types based on their characteristics. Students can be taken into nature to observe the diversity of plant types and their ecosystems, and can directly recognize the plants present, thereby optimizing the learning objectives.

Criteria for Herbaceous Plants

Herbaceous plants belong to the seed plants (Division Spermatophyta) and most are classified as angiosperms (Subdivision Angiospermae), including both the Monocotyledoneae class (single-seeded plants) and the Dicotyledoneae class (double-seeded plants). Angiosperms encompass a wide variety of agricultural and ornamental plants, including both annuals (plants that live for one season) and perennials (plants that live for multiple seasons). Herbaceous plants are cosmopolitan in nature because they spread easily and grow almost anywhere, resulting in their abundance in the wild. Angiosperms are true corm plants, meaning plants that can be clearly distinguished into three main parts: roots (radix), stems (caulis), and leaves (folium). Their leaves belong to the macrophyll type, with diverse shapes and arrangements of leaf veins.

Their embryos are bipolar or dipolar. Not only does the stem grow and develop into a stem, branches, and leaves, but the root also grows and develops into a root system. The general criteria for herbaceous plants are as follows:

1. The stem is soft, fleshy, and non-woody (wet stem), round or mostly angular in shape,
2. The root system is taproot and fibrous or rhizome roots underground,
3. Leaves are clustered at the base of the stem or spaced apart,
4. Leaf sheaths are present, but no ligules,
5. Leaf blades are linear with longitudinal veins,
6. Flowers are unisexual or bisexual, arranged in spikelets that then gather together to form different inflorescences,
7. Flowers stand alone in the axils of the glumes,
8. There is no perianth,
9. One to three stamens,
10. Free stamens, two anthers,
11. One ovule, one seed,
12. One pistil, usually branched into two or three,
13. Fruit does not open, seeds detach from the fruit wall,

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14. Generally reproduces by seed.

Based on the above categories, the following are some examples of plants classified as herbs:

1. Banana (Musa paradisiaca, L) characteristics: perennial, clumping with rhizome roots, lanceolate leaves, easily torn, waxy underside of leaves, unisexual flowers in clusters. Reddish-brown bracts. Waxy, each axil contains numerous flowers arranged in two transverse rows.
2. Papaya (Carica papaya, L), characteristics: herbaceous tree-like plant, taproot, straight cylindrical stem, hollow leaf stalks, lobed leaves, many seeds, regular flowers, five-lobed calyx, five petals, ten stamens.
3. Turmeric (Curcuma domestica, Val.), characteristics: rhizome roots, erect stem, leaf sheaths clasping the stem, leaves often clearly in two rows, bisexual flowers, tubular calyx, three petals attached at the base.

Herbaceous Plant Diversity

Diversity is a term used to describe the number of species or individuals, whether animals or plants, that live and occupy a particular place that has become their habitat. According to Deshmukh, diversity is the combination of the number of species and the number of individuals of each species within a community. Furthermore, Resosoedarmo states that diversity is the number of plant species or plants living in a particular place. A community is a part of an ecosystem consisting of a collection of plants and animals that together form a plant and animal society. Plant species diversity indicates the number of plant species with the characteristics mentioned above that live, grow, and reproduce in their habitat within a community. Plant species diversity in one community will differ from that of another community. This occurs because plants have varying abilities to adapt to their environment. Many factors can influence the presence of a plant species in a community. The diversity of herbaceous plants and their presence in a community are greatly influenced by ecological factors such as climate, which includes light, temperature, rainfall, evaporation, and wind, and soil or edaphic factors, which include mineral fragments, groundwater, soil air, organic matter, and living organisms, as well as biotic factors, which include living organisms, animals, plants, and humans. Herbaceous plants belonging to the Angiospermae (flowering plants) have diverse characteristics, including perennial herbs, sturdy herbs, clumping herbs, resinous herbs, creeping herbs, herbs with creeping stems, and tree-like herbs. The dispersal of herbaceous plants can occur in various ways, including by wind, typically for plants with winged seeds; by water, especially for plants living in or near water; and by animals and humans.

The Role of Media in Learning Activities

In general, learning media are all channels of communication that can be used as a means of communication in the teaching and learning process. The use of media in the teaching and learning process can avoid verbalism. The role of media in the teaching and learning process includes: a. As a learning aid, educational media can provide meaningful educational experiences for students. Media can provide real learning experiences because they engage all the senses and the mind. b. As a communication tool, with the use of media, the delivery of messages from the source (educator) to the recipient (student) will be easier to understand. c. As a tool for fostering creativity. To encourage students to engage in lessons, biology teachers need to create a pleasant learning environment. Presenting lesson material in a monotonous

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manner is ineffective; instead, using varied and appropriate media will help students focus their attention on the lesson being presented.

The Benefits of Herb Diversity as a Medium

The biology curriculum includes excellent concepts that support the learning process by utilizing plants found in the natural environment as a medium, particularly the concept of biodiversity. As per the core competencies outlined in the 2004 curriculum, students are expected to be able to recognize and understand the biodiversity present in nature, enabling them to classify plants according to their types and characteristics. Direct exposure to various plants, especially herbaceous plants, maximally stimulates students' senses to record the forms and phenomena observed in the objects being studied. Suhardi states that as educators in the field of biology, biology teachers must also be able to utilize the natural environment as a learning medium for students, as it provides multi-sensory and multi-impressive stimuli.

Herbaceous plants are a type of plant that is part of the Biodiversity learning material. Herbaceous plants that are classified as cosmopolitan are the easiest to find because they can grow almost anywhere. Biology teachers do not need to go to great lengths or spend time and money because herbaceous plants can also be found in the school environment. The plants that grow in our environment and are classified as herbs usually grow well in school yards, home gardens, forests, rice fields, riverbanks, or other places in nature. The herbs found in all these places can be used as teaching aids in biology lessons. As mentioned earlier, in the learning process, biology teachers must strive to be creative in order to achieve the desired learning objectives. Utilizing existing plants as teaching tools is one of the easiest, most appropriate, and fastest ways for students to understand and become familiar with the plants studied in biology lessons.

Types of Media in Biology Learning

In general, learning media can be classified into four types, namely: 1. Visual media, such as: blackboards, bulletin boards, pictures, graphs, maps, and others. 2. Audio media, such as: radios, tape recorders, and others. 3. Media that can be seen and heard, such as films and television. 4. Three-dimensional objects that are typically displayed, such as sandbox models, electric maps, and museum exhibitions.

CONCLUSION

Student learning outcomes each semester are greatly influenced by internal factors (including health, intelligence and talent, interests and motivation, and learning methods) as well as external factors (including family, school, quality of biology teachers, teaching methods, curriculum suitability for children's abilities, school facilities and equipment, classroom conditions, number of students per class, community, environment, and others). The use of appropriate and effective learning media will benefit biology teachers and students as it can facilitate the teaching and learning process and is highly beneficial for students as it significantly aids in enhancing their understanding and comprehension of the taught material. The diversity of plants in general and herbaceous plants in particular that exist in nature is a medium that can be utilized and developed to help students understand and recognize the types of plants that are classified as herbaceous, especially those related to the subject of Biodiversity.

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