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High-quality Resources of Local Universities Serve the Innovation of Biology Teaching in Middle Schools

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Abstract: Middle school biology is an important part of middle school teaching system. In middle school biology teaching, some teachers always pay attention to teaching theoretical knowledge, ignoring the problem of letting students practice in the process of learning biology. There will also be some problems, such as insufficient teachers and resources for biological experiment teaching. In order to enable students to have good teaching resources in the process of learning biology, the laboratory resources in colleges and universities can serve the biology teaching in middle schools. The laboratory resources in colleges and universities are the bases for experimental teaching and scientific research, with abundant laboratory equipment and concentrated technical force. Therefore, making high-quality resources of colleges and universities serve biology teaching in middle schools can better help middle school students to learn biology.

Keywords: high-quality resources of colleges and universities; middle school biology; teaching innovation

1. Introduction

According to the new curriculum reform, teachers are required to change the former biology teaching mode and students' learning methods, and students should actively participate in, be brave in exploring knowledge and be diligent in practice in the process of biology learning, so that students can develop good practical ability and innovative consciousness in the process of learning biology (Tan et al., 2021). Compared with the previous biology teaching methods, in the current biology teaching, the proportion of experiments is relatively large, and there are more contents for students to conduct experiments. The contents of biology textbooks are also relatively novel, and the conditions needed to complete experiments are also increased. Because there are some problems in middle school biology teaching, such as insufficient experimental teaching resources and insufficient teachers, colleges and universities should give full play to their own superior resources and share resources with middle school biology teaching, so that middle school biology teaching can have better innovation.

2. The key factors that restrict biology teaching in middle schools

2.1 Laboratory factors

According to the new curriculum reform, in order to cultivate students' ability to learn biology, experimental teaching has become an indispensable part of biology teaching in middle schools. Most of the relevant experimental instruments invested by schools in biological experiment teaching are relatively few, and the biological laboratory configured by schools according to relevant regulations allows students to learn only a limited amount of content. Generally, students are teachers-oriented, and teachers blindly impart biological knowledge to students, and students adapt to the teachers' professors (Yang & Sun, 2021). In general, in middle school biology experiments, students conduct experiments in groups of two at most. This kind of experimental teaching is not conducive to students' group discussion on biology knowledge and sorting out data. The lack of funds for biology experiments in middle schools leads to inadequate facilities for biology experiments, and the number of experiments conducted by students will be relatively low. Some schools will also appear, and the biology group experiments in middle schools cannot be carried out, so that students can recite the knowledge content of biology experiments, which will seriously affect students' experimental skills and hands-on ability, and students have no way to better grasp the knowledge content of biology.

2.2 Factors of biology teachers

In the middle school biology teaching team, because there will be some biology teachers who graduated early, the teachers did not receive the training of biology experimental skills in the later stage, resulting in poor hands-on ability of teachers, and the teaching concept and learning methods for students are relatively backward. When teaching biology to students, teachers do not have the consciousness of innovative teaching. Teachers just pass on biological knowledge to students blindly, neglecting to let students have good innovative ability and practical ability in the process of learning biology. In biology experiment teaching, most biology teachers who graduated in the early stage tell the students the contents of hands-on experiments, and let the students recite the key contents taught by the teachers. It is this appearance that

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leads to the uneven teaching level of biology teachers in middle schools, and students also have no experimental skills for biological practice because they cannot get practical exercise in biological experiments for a long time.

3. The high-quality resources of local colleges and universities serve the teaching ways of biology in middle schools.

3.1 The laboratory is open regularly.

For the resources of biology teaching in middle schools, the teaching resources and laboratory resources in colleges and universities are not available in middle schools. Therefore, in order to make biology learning in middle schools have a better development, university laboratories can strengthen the communication with middle schools, establish a people-oriented educational concept, and let the experimental equipment and teacher resources of universities be shared with middle schools, so as to give full play to the advantages of teachers (Liu, 2021). Colleges and universities can give middle schools a path of active exploration without affecting their own teaching, so that junior middle schools can carry out practical learning.

For example, colleges and universities can use their free time in winter vacation to open laboratories for middle schools. For example, the specimen room, cell room, etc. in colleges and universities allow students to visit the laboratory, let them know some experimental instruments that they have never seen or are rare, know some specimens and models, and let them know the functions and usage of the instruments by watching them. Colleges and universities can also hold some contests on specimen display and experimental operation of biology with qualified middle schools. In order to let students, know more about biology, colleges and universities can also organize some academic lectures with middle schools, so that students can learn more about biology and accept better biology teaching.

3.2 To carry out experimental guidance and training for students.

In middle school biology textbooks, more and more attention is paid to experimental teaching, and the knowledge content of biology textbooks also increases the proportion of hands-on experiments for students, so that students can conduct exploratory experiments in the process of learning biology. This new biology textbook has certain requirements for cultivating students' observation ability, hands-on practice ability and innovation ability in learning biology (Li et al., 2020). Students can improve their practical ability and cultivate their innovative ability through biological experiments. According to the content of middle school biology textbooks, colleges and universities should actively carry out research studies with middle schools, so that students can have a good platform for biological practice.

For example, the laboratory equipment in colleges and universities is sufficient, and the experience of teachers' guidance is very rich, which can provide a good platform for students to carry out biological experiment skills training. Besides, the advantages of scientific research in colleges and universities can be used to explore biological subjects in colleges and universities and biology in middle schools, so that the teaching design of biological experiments in colleges and universities and middle schools can be effectively combined. Through this design of experimental teaching research, teachers can guide students to consult materials, preliminarily design experiments and make plans, so that students can effectively master the principle and design scheme of biological experiment design, and enable students to independently explore the basic methods and processes of experiments. Through this method, students' personal potential can be tapped, so that students can actively participate in the exploration of biological experiments and lay a solid foundation for students to learn biological knowledge in the future.

3.3 Providing technical support for experimental teaching in middle schools.

In middle school biology teaching, when students are being taught in experiments, there will be a shortage of experimental equipment, and the phenomenon that the school does not pay attention to students' biology teaching will appear. Some biology teachers have not done experiments in the new textbooks themselves, and they have not received systematic training in experimental teaching methods, resulting in no way to teach students in biology experiments, and students have no ability to practice experiments in the process of learning biology. Therefore, colleges and universities can actively provide technical support for biology teaching in middle schools.

For example, colleges and universities can give their newly eliminated biological research equipment to poor middle schools to improve the teaching conditions of biology teaching in middle schools, so that this equipment can actively and effectively serve as teachers' biological teaching resources, and teachers can complete simple biological experiment teaching.

For example, middle school biology teachers can be trained according to the requirements of the new curriculum, so that teachers can learn biology in a targeted way, so that teachers can play new challenges in the field of biological knowledge innovation, comprehensively improve the overall quality and teaching ability of middle school biology teachers, and help students solve some problems that are difficult to solve in the process of biological experiments, so that students can learn from biology teachers, learn to innovate in biological learning, improve students' learning ability and hands-on practice ability in biological learning, and improve their professional quality and teaching ability in biological teaching.

4. Conclusion

With the requirements of the new curriculum, in order to make middle school biology teaching play a good teaching effect, colleges and universities can provide help to middle school biology teaching with their own sufficient high-quality service resources. Because the biological laboratory in colleges and universities is well equipped, the laboratory has abundant resources. Therefore, colleges and universities should give full play to their advantages, strengthen the connection with biology teaching in middle schools, and build a good teaching platform for middle schools, so that students can use the high-quality resources of colleges and universities to strengthen the effect of students' learning biology.

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Conflicts of Interest

The authors declare that they have no conflicts of interest to this work.

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