Application of High Definition Digital Interactive Microscope and Digital Section in Pathology Experiment Teaching

Juan Long¹, Heng Yuan¹*, Jun Zhang², Yalin Li¹, Yan’e Chu¹, Shuangrong Li¹
¹Changsha Medical College, China
²The First Affiliated Hospital of Changsha Medical College, China

*Corresponding author e-mail: 21773978@qq.com

Abstract. The high-definition digital microscope interactive telescope and digital section should be able to effectively improve the observation efficiency of pathological images and the quality and level of pathological experiment teaching. Based on this, this paper first studies the advantages of high-definition digital interactive microscope and digital slice in the process of pathology experiment teaching, then analyzes the application effect of them, and finally gives the prospect of their application.

Keywords: High Definition Digital Interactive Microscope, Digital Section, Pathology Experiment Teaching

1. Introduction

With the rapid development of digital technology, especially the application in the field of medicine has greatly improved the progress and development of medical level. The traditional pathology teaching mode is gradually changing to the microscopic digital interactive teaching mode, which makes the digital technology be popularized and applied in more and more fields[1]. For example, the high-definition digital microscopic interactive telescope and digital slice should be able to effectively improve the observation efficiency of pathological images and the operation skills in pathology experimental teaching promote.

In addition, the high-definition digital microscope interactive telescope and digital slice should be able to improve the students' ability of independent learning and learning effect, and realize the sharing of information resources, so as to promote students to better master and understand the knowledge and content of Pathology, so it has important practical research value.

2. Advantages of High Definition Digital Interactive Microscope in Pathology Experiment Teaching Process

2.1. Shortcomings of traditional pathology experiment teaching

The traditional pathology experiment teaching often adopts the glass slice to carry on the medical pathology observation, which has many malpractices[2]. First of all, there are higher requirements for the teaching site, and teachers should have a microscope in the laboratory to be able to carry out
observation teaching, which leads to students cannot flexibly carry out independent learning. Secondly, because the glass chips are easy to be damaged, there are higher requirements for the operation process, which not only leads to higher experimental cost, but also the effect is often difficult to control. In addition, it is difficult for students to accurately find the typical tissue structure in the glass section under the microscope, which further limits the learning effect of students.

2.2. Advantages of high definition digital interactive microscope in pathology experiment teaching

Thanks to the rapid change and development of digital technology and electronic information technology, the high-definition digital interactive microscope can integrate the information in the computer database and observation information under the microscope, thus making the information exchange between students and teachers more efficient and convenient. On the one hand, teachers can supervise students' learning state in time; on the other hand, students can consult teachers in time for problems encountered in the experiment process, so as to improve students' learning effect and enthusiasm. In addition, the high-definition digital interactive microscope can display the pathological structure of the digital section more intuitively, so that students can have a clearer judgment of the pathological tissue\(^{[3-4]}\). In a word, compared with the traditional glass slice observation, the application of high-definition digital interactive microscope system has several significant advantages as shown in Figure 1.

![Figure 1. Advantages of high-definition digital interactive microscope system](image)

However, in the application of high-resolution digital interactive microscope, teachers should pay attention to guide the students to observe the images under the mirror of the digital micro interactive system, so as to avoid the damage of the lens of the microscope and the glass slide during the operation.

3. Research on the Application of Digital Slice in the Process of Case Study Experiment Teaching

3.1. Disadvantages of traditional glass section in pathology experiment teaching

Traditional glass is limited by the characteristics of glass materials, whether it is used or preserved, there are many problems, which specifically reflected in the following three aspects: first of all, glass chips are easy to be damaged, which not only increases the cost of the experiment, but also has the risk of students hurting themselves in the use process. Secondly, the glass section is not easy to preserve, long-term storage will cause discoloration, which makes the pathological tissue difficult to observe. In addition, it is difficult to make specific glass sections for typical tissues, which makes it difficult to carry out normal pathological experiment teaching for specific cases.

3.2. Advantages of digital section system in pathology experiment teaching

The digital slice can acquire and splice the pathological tissue images seamlessly and generate high-resolution images automatically through the automatic process scanning\(^{[5]}\). In addition, the image generated by the digital slice can be further edited, such as zooming in, zooming out and labeling, so that students can observe the structure and characteristics of pathological tissue more intuitively. In
addition, the digital slice should make students have more autonomy and convenience in learning, and no longer be bound by the experimental site\textsuperscript{[6]}. Students can flexibly carry out preview and review according to the teacher's teaching plan, which greatly improves the learning effect and further promotes the students' learning efficiency and initiative. However, in the application process of digital slice, teachers should pay attention to the guidance of students' practical ability and microscope using ability, and promote students' learning of course content.

4. The Effect of High-Resolution Digital Interactive Microscope and Digital Section in Pathology Experiment Teaching Process

Through the comparison of high-definition digital interactive microscope and digital section with traditional pathology experiment teaching and glass section, it can be found that it has more significant advantages. In order to further test its application effect, research its application, and study the specific embodiment of its advantages in pathology experiment teaching. The research results of its application effect are shown in Table 1 below.

| Levels      | Effect results                                      |
|-------------|----------------------------------------------------|
| Student level | Improve autonomous learning, personalized learning and learning initiative enhancement |
| Teacher level | Facilitate supervision and guidance, promote teaching quality |
| Site level   | More space flexibility                             |
| Image level  | Clearer and high quality                           |

4.1. The effect analysis of the application of high-definition digital interactive microscope and digital section in pathology experiment teaching

As can be seen from table 1, the application of high-definition digital interactive microscope and digital section in the experimental teaching of pathology has achieved remarkable results. First of all, at the student level, students' autonomous learning ability and learning interest have been significantly improved. Secondly, at the level of teachers, the teaching mode can significantly improve the quality level of case experiment teaching teachers and digital information literacy. In addition, because of the more convenient communication and interaction between teachers and students in the process of experimental teaching, the atmosphere of experimental teaching classroom and the pertinence and effectiveness of teaching activities have been greatly improved.

4.2. Prospect of application of high-definition digital interactive microscope and digital section in pathology experiment teaching

Although the application of high-definition digital interactive microscope and digital section in pathology experiment teaching has many advantages, but in order to achieve further development and application, it still needs to solve some practical problems in case experiment teaching, for example, higher requirements for teachers' information literacy and effective maintenance of experimental equipment. Due to the application of many information and digital technologies in the high-definition digital interactive microscope and digital slice, it brings high challenges to the information literacy of teachers. And in order to ensure the normal operation of the equipment, they also need the regular maintenance of professionals, thus increasing the cost to a certain extent. In addition, in order to give full play to the effect and advantages of the model, both teachers and students need to have high information literacy, so they need a certain period of pre-class training and adaptation process. In a word, with the rapid change of mobile digital technology, the application prospect of high-definition digital interactive microscope and digital section in pathology experiment teaching process will be broader.

5. Conclusion
In summary, the application of high-definition digital interactive microscope and digital slice in pathology experimental teaching completely subverts the operation mode of traditional glass slice in pathology experimental teaching, greatly improves the play of students' subjectivity, and makes students' learning autonomy and initiative significantly improved. At the same time, teachers should enhance their own information literacy, and strengthen the correct guidance of students' experimental process, so as to continuously promote the effect and advantage of the pathology experimental teaching mode to the maximum.

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