Original Research Article

Application of Micro-Lessons in Surgery Teaching

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Abstract: Micro-lessons have the characteristics of various forms, clear objectives, and good performance, and have been widely used as a new teaching resource in recent years. Surgical science is a bridge course from theory to clinical practice for medical students, which plays an important role in improving medical students’ aseptic concept, basic surgical learning skills and general consciousness of surgery. According to the content and characteristics of surgical teaching, aiming at the foundation of surgical teaching and combining the advantages of micro-lessons, this article discusses how to use excellent learning resources to improve the teaching effect of surgical science under the digital background.

Keywords: Micro-lesson; Surgery; Teaching reform

Micro-lesson is a brief and complete teaching activity that teachers use knowledge points or teaching links to provide students with “self-service” resources to help them understand some basic concepts, but it needs skills. Micro-lesson has created favorable conditions for the reform of surgical teaching, and has the characteristics of outstanding discipline, short in length and clear content.

1. Surgical teaching status

Surgery is an important part of surgical courses, and it is also a required course for surgeons to practice basic surgical skills. The teaching quality is directly related to the quality of clinical practice and clinical study of medical students.

2. Analysis of the factors restricting the teaching of surgical skills

The factors restricting the teaching effect of surgical skills are mainly reflected in the following aspects: (1) It is difficult to guarantee the central teaching time in clinical trials. Surgical skills belong to the content of surgical clinical teaching, and the instructors are full-time surgeons in primary care, whose workload is heavy. They often ignore the teaching work. (2) Clinical teaching of surgical skills is mainly clinical observation teaching and application guidance teaching, and the number of students is limited. At present, there are a large number of undergraduate surgical students, so it is difficult for every student to get clinical observation, let alone fully participate in surgical teaching practice. (3) There is a relative shortage of surgical skill guidance resources. The main teaching resource of surgery teaching is surgery video. Due to the special nature of surgery, working environment of operating room and personal privacy, the long video recording of surgery is limited. (4) The task is heavy. The existing video resources require a fast production and editing mode, teaching video and after-school conversion. So a large number of teaching surgical teaching staff should work free of charge. (5) The demand is strong. Students need more self-learning and process in clinical teaching, and...
need more study time and space for self-planning.

3. The necessity of surgical teaching reform

Operation is the main means of surgical treatment, and the basic operation is the necessary condition to complete the operation. Surgical science requires students to master the basic working skills of aseptic surgery, master complex surgical methods, and to have overall awareness of surgery and pay special attention to the development of clinical thinking ability. Because of the aseptic working environment in the operating room, which restricts the health system and regulations, it makes it impossible to carry out practical training in the operating room. In addition, the development of animal experiments is restricted by factors such as animal test cost, animal safety and post-operation animal care, so it is necessary to study effective teaching methods.

4. The application of micro-lessons in the surgery teaching

According to the technical specifications and professional status, and referring to the relevant professional competence standards, the surgical contents are divided into four modules: aseptic technology module, surgical equipment identification and use module, surgical basic technology module, and surgical combined operation module. The information is independent of the modules and also contacts the modules step by step. Combined with the characteristics of micro-lessons, clinical surgery simulation scenes, students’ practice simulation, the online teaching platform is used to help students’ after-school self-study, and repeatedly integrate education.

4.1 The selection of micro-lesson content—highlighting the details of guidance

Reasonable use of micro-lessons can grasp every detail and help students understand key points and face challenges. Surgical science can only directly influence students’ learning through the teacher’s explanation, but can’t explain in detail the standard degree, pertinence, repeated playback and teaching function of teaching. Micro-classroom teaching can intuitively meet students’ needs of monitoring and learning, which not only effectively saves teaching resources, but also greatly improves the teaching effect. For example, in the micro-teaching of “skin suture”, the teaching contents are designed with the following parts and ppt, as well as videos and other forms of screens: (1) importing clinical conditions; (2) classification and principle of sewing; (3) preparation of substances; (4) skin sewing operation; (5) mistakes easy to be made. Through micro-lessons, students can achieve their learning goals and better understand the knowledge points taught in class.

4.2 The design of micro-lessons—paying attention to the cultivation of professional ethics and professional spirit

Understanding the importance of medicine, professional ethics and psychological education, human science, medical schools and universities is a research on understanding the humanistic quality education curriculum. It is believed that humanistic quality education should be closely combined with clinical application in order to achieve better results. Today, the enhancement of patients’ awareness of self-protection and the practice of participating in clinical treatment without a license have led to that the clinical application of medical students, especially the surgery has been almost “pending”.

Therefore, humanistic quality education should be integrated into the design of surgical micro-lessons, which runs through the whole teaching. For example, in the micro-lessons of clean surgery, the clinical application image of clean surgery is displayed in concrete details, which is not only beneficial for students to master this technology, but also conducive to cultivating students’ awareness of aseptic surgery, respecting patients (constant, accurate, light and fast) and attention to communication with patients.

5. Micro-lesson design

Micro-lesson design mainly includes teaching analysis, teaching design, micro-lesson development, implementation and evaluation.
5.1 Teaching analysis

Basic surgical technical operations, such as various sewing methods, need teamwork to complete, and standard operations often need manual guidance. In recent years, the number of vocational students in colleges and universities is increasing every year, and the class size is generally too large. It is difficult for teachers to explain and take care of each student in traditional teaching methods. If teachers cannot guide students and teach repeatedly, students will not be able to achieve learning goal. The basic content of micro-lessons is to learn how to operate, and watch micro-videos over and over again through classroom teaching videos, mobile phones, mp4, etc. Through micro-lessons, students can achieve their learning goals and better understand the knowledge taught in class. It is very important to promote independent learning and effective learning. Micro-lesson is an important supplement and expansion of traditional classroom teaching, whether it is of teaching or teachers’ professional development.

5.2 Teaching design

Name of the micro-lesson: Surgery. Source: National Vocational School of Public Health Press, the sixth edition of the planning textbook of the Ministry of Health, edited by Xiong Yunxin. Qualified: second-year students in clinical department of high professional. Teaching type: practical training. Design concept: the teaching content is divided into the following parts, such as basic operation of surgery, node type (square node, surgical node, three nodes), node method (one-handed node, clamped node), seam type (simple broken seam, simple continuous suture, lotus suture, etc.), comprehensive training, and the following information points can be selected, like the suture method of clinical condition.

5.3 Teaching process

(1) Opening (within 30 seconds); (2) explaining and demonstrating the text (2–3 minutes to 9 minutes); (3) ending (within 30 seconds). Micro-lessons can be evaluated by students’ feedback, practical training assessment, click-through rate of micro-lessons, etc. Finally, self-teaching reflection can be carried out.

6. Micro-lesson production

Micro-lesson making methods are very flexible and diverse. Combined with the content characteristics of surgical science, course registration is selected, that is, real class record, teacher-led content and camera recording at the same time, PPT presentation and student activity record. Then organize it into one or more micro-lessons according to the information points. Camera shooting requires professional shooting and editing, which requires teachers to be full of spirit and speak clearly in class. Video learners are the key in the actual study of micro-lessons. Digital mobile phones can also be used for shooting, but it is not professional enough. Hu Tiesheng of Education Bureau of Foshan City, Guangdong Province believes that “the shooting and editing techniques of classroom videos are the main factors restricting the quality of micro-lessons. Thea Studio software, of powerful video playback and video editing functions, is used to edit educational videos. It can be used to create a three-step micro-lesson: importing—editing—exporting. Here’s how to do it.

(1) Import media

Open the video recording software, click “Import Media” to import the prerecorded video. Right-click and select Add to Timeline Play to play clips at will.

(2) Edit the video

Camtasia Studio software is used to process and beautify micro-lessons, and edit videos, such as zooming, marking, cutting, and adding subtitles.

a. Select the “title clip” button on the “insert” menu, drag it directly to the editing section below after the title is completed, and then open the project setting dialog box, and specially select the WEB default value to adjust the size and format of the video. If it is necessary to locally enlarge the basic process, the zoom function in the software can be applied to attract students’ attention by highlighting the hand movement of knotting with one hand on the screen.
Choose the time point required for enlargement, click the “Zoom” button, and a transparent rectangular box will appear on the highlighted area on the screen, and then the corresponding key frame will appear on the timeline. Zoom this part in the preview area and select the zoom function until the end of time. At this time, the relevant key frame will be displayed on the timeline, and the highlighted area will be enlarged. To mark three attributes of a node, the Label button should be clicked. A Label Edit Box will be displayed to adjust the shape, color and other effects on the label.

b. Select audio processing, media import and audio file. Click right mouse button, add to timeline, and select audio track. The volume of the title and background music at the end of the movie can be adjusted by dragging the sound line in the audio line as needed.

c. Add subtitles, close other parts, and open video tracks. Add subtitle positions, add comments, and select subtitle paths. Pay attention to proper font size, compatible colors with background colors, and coordinated access modes, coordination with the video images. The position of subtitles can be resized, and a later point can be set to finish. Then listen and adjust the position and time.

d. With the help of the test function of the software, select the time point needed to add the test, click the “Test” button, and there will be a “Test Edit Box” in this edit box. The types of test questions can be set, such as multiple-choice questions, test questions, test questions and feedback questions. The time axis appears in the relevant key frames, and the test interface can be seen in the video preview area.

(3) Export video

After editing the micro-lesson, media files that meet the requirements are generated, such as mp4, mpg, avi and rmvb, among which mp4 is the most normally adopted format. Select custom build settings—mp4 rendering.

7. Conclusion

Of course, there are some obvious problems in the application of micro-lessons in surgical science teaching, which need continuous improvement and perfection: (1) Surgical science is a highly realistic issue, so the design of micro-lessons should be closely followed in clinical practice. Teachers should collect micro-textbook materials of clinical practice, record surgical videos, and organize them together with clinical scenes, so as to keep the teaching contents of micro-lessons consistent. (2) Relying on the network teaching platform, micro-lessons can better meet the urgent needs of students’ personalized autonomous learning and lifelong learning. The construction of micro-lesson platform is the foundation of course display, course study and course resource database construction.

To sum up, as a new type of teaching resource, micro-lessons have obvious advantages in teaching. It is necessary to cross the boundaries of micro-lessons and enable them to play a greater role in teaching.

References