Talking About the Design and Practice of Micro-lessons in Biochemistry: Taking Vitamin A and Human Health as an Example

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Abstract. Objective To explore the characteristics of "micro-lessons" production in biochemistry, to find teaching mode suitable for medical education and teaching characteristics in the Internet era. Methods Taking "Vitamin A and Human Health" as an example in biochemistry to explore the characteristics of micro-lessons in biochemistry. 400 students of clinical medicine undergraduate in Grade 2016 were selected and randomly divided into 2 groups by cluster sampling method. The micro-lessons teaching model was applied in the control group of 200 students in 1-4 classes, while the traditional teaching mode was applied in the experimental group of 200 students in 5-8 classes. And randomly selected 100 students in the experimental group, we survey the strengths and weaknesses of micro-lessons in biochemistry from the micro-lessons production, knowledge memory learning and theoretical practice and other aspects of the questionnaire. Results The scripts were designed carefully and the materials were dealt with reasonably. The micro-lessons were completion of production successful. The score of the test results \[9.52 \pm 0.56\] in the experimental group was higher than that of the control group \[8.73 \pm 0.39\] (\(p = 0.00\)), the difference was statistically significant. In the eight indicators, the teaching method is endorsed by most students. Conclusion The micro-class in Biochemistry can expand learning time, with repeatability, break the traditional teaching deficiencies. To adapt biochemical reform requirements in the network environment curriculum, it is worth in other professional basic courses to try.

Introduction

Biochemistry is one of the important professional basic courses in medical universities. It uses chemistry principles and methods to explore the essence of life phenomena and focuses on the basic theory and viewpoint from the perspective of medicine. With the arrival of the "new media" era, micro-lessons gradually rise in the scope of teaching, which is characterized by short and pithy, to overcome the large amount of learning, learning time scattered and so on [1]. Micro-lesson is the teacher in the classroom teaching using video, a new teaching tool, more effective focus on student attention, full construction of knowledge framework, theme clear, focus, to achieve anytime, anywhere in the mobile terminal to watch learning, to achieve happy learning [2].

Design of Micro-lesson

Explore the Goal of Teaching

The goal of teaching refers to the focus of this micro-lessons content and to achieve the results. As the micro-lessons time to control in 20 min, try to split into a number of sub-courses, to ensure that short and pithy. To "vitamin A and human health", for example, the micro-lessons mainly teach the source of vitamin A, biochemical and lack of disease. We take into account the extent of the audience's understanding and close contact with daily life and the symptoms of common diseases such as night blindness or dry eye.
The Preparation of Micro-lessons Script

Micro-lessons script refers to the time axis as the axis of the picture, video, ppt and other organic combination to the audience, including titles, import, teaching, summary, thinking and preview, ending and so distributed to each point in time. The script is clear, concise and flexible, as shown in Table 1.

Table 1. “Vitamin A and human health” of the micro-lessons script design.

| Order | content |
|-------|---------|
| Title | Work name, name of the instructor, Unit | time (s) |
| Import | Through the props and clinical phenomena reveal the role of mucosal barrier (How many kinds are the barrier of protection), Vitamin A deficiency symptoms introduced, introduce the biochemical role of vitamin A, into the main content of this lesson. | 55 |
| The explain of the text | 1 The source of vitamin A Active form: retinol, retinal, retinoic acid Source: liver, meat, egg yolk, dairy products and cod liver oil Teaching methods: to explain, combined with courseware, contact life | 65 |
| | 2 Biochemical effects and lack of disease of vitamin A 2.1. Biochemical effects 2.1.1. The combination of retinal and opsin to play its visual function 2.1.2. Retinoic acid on gene expression and tissue differentiation has a regulatory role (involved in cell membrane glycoprotein synthesis, maintenance of epithelial tissue differentiation and sound) 2.1.3. Vitamin A and carotene are effective antioxidants 2.1.4. Excessive vitamin A can cause poisoning 2.2. Lack of disease Night blindness, dry eye Teaching methods: to explain, combined with courseware, contact clinical cases | 312 |
| summary | Combined with the case of vitamin A in the form of active, biochemical and lack of disease | 58 |
| Work and preview | After school thinking: the mechanism of vitamin A deficiency Preview: The next lesson (Vitamin D) | 67 |
| Tail | Acknowledgments | 5 |

The Collection and Finishing of Material

Micro-lessons script material can be collected through various Internet search, e-library or peer exchange. In order to avoid copyright issues, in the last part of the micro-lessons indicate the source of the material to respect the original author and expressed gratitude.

The Release of Micro-lessons

The biology teaching syllabus, curriculum related cases and related teaching materials uploaded to the network teaching platform, the general choice of Flash, wmv, MP4 and other mainstream formats, easy to PC, Tablet PC and smart phones and other mobile terminals to watch, while building e-learning platform Such as online discussion, online Q & A, online test, online survey, etc., to provide students with an independent learning and self-learning environment, while learning about their own learning situation, but also for teachers to analyze the learning situation provided by students in order to be targeted in the classroom.
Teaching Application of Micro-lessons

Objects and Methods
Random selection of 2016 class of clinical medicine 1-4 classes (200) to implement the micro-lessons teaching for the experimental group, 2016 clinical medicine professional 5-8 classes (200) to implement the traditional teaching as the control group. There were no significant differences between the two groups in teacher matching, teaching conditions and teaching contents. A: 100 students in the experimental group were randomly selected from the experimental group, from the micro-lessons production, the knowledge memory learning ability and the theory of contact practice and so on. B: In the experimental group, to investigate the advantages and disadvantages of micro-lessons in Biochemistry.

Statistical Analysis Method
Use SPSS 22. 0 statistical software for the t test, according to $\alpha = 0.05$ level, the difference was statistically significant with $P <0.05$.

Analysis of Questionnaire Results
100 students in the experimental group to send the questionnaire, on the spot to recover 100, the effective recovery rate of 100%. The results are shown in Table 2.

| Survey indicators                              | satisfaction (%) | Recognized (%) | Disagree (%) |
|-----------------------------------------------|------------------|----------------|--------------|
| Take the initiative to download teaching methods | 82               | 11             | 7            |
| Highlight the focus                           | 90               | 7              | 3            |
| Improve learning interest                     | 83               | 10             | 7            |
| Cultivate independent learning habits          | 82               | 14             | 4            |
| Strengthen knowledge memory                   | 89               | 9              | 2            |
| Repeatable learning                           | 92               | 5              | 3            |
| Help to improve your grades                   | 87               | 9              | 4            |

Analysis of the Results of the Small Quiz
In the experimental group, the score of small test scores $[9.52 \pm 0.56]$ was higher than that of the control group $[8.73 \pm 0.39]$ ($p = 0.000$).

| Group            | Results      |
|------------------|--------------|
| test group       | 9.52±0.56    |
| Control group    | 8.73±0.39    |
| t value          | 6.68         |
| p value          | 0.000        |
Discussion

Through the evaluation of the application of biochemistry micro-lessons teaching, we have a well-designed biochemistry teaching reform represented by "Vitamin A and Human Health" as a useful attempt. With the rapid development of new media and mobile terminal technology and the emergence of micro-lessons, higher education has entered the micro-era, which with contemporary college students through the Internet to obtain a large number of information channels [3]. After the investigation of biochemistry in the understanding of knowledge, memory needs to be repeated, and micro-class with its unique characteristics can strengthen the review, consolidate knowledge, strengthen memory and improve academic performance. Of course, there are still problems in the biochemistry design and recording process, such as not covering the book knowledge points, teachers record video status, data updates and other issues, which will be in the future teaching work to gradually improve and improve [4-5]. In the era of new media technology such as micro-lessons, MOOC and other new media technologies, college teachers should make full use of digital campus to bring new blood to teachers' career development, stimulate teachers' application of information technology initiative and improve teaching technology design and potential development. It is the challenges and opportunities of teachers face in the medical college.

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