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Research Article

Application of "Flipped Class" Teaching Mode Based on Micro-Course Video in the Training of Urinary Incontinence and Enterostomal Therapists

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Abstract

Objective: To explore the application effect of the flipped class teaching mode based on micro-course video in the training of "International Incontinence Enterostomal Therapist".

Methods: The experimental group used the flipped class teaching mode based on the micro-course video, and the control group used the traditional routine teaching method. Before and after the teaching, the scores of the two groups of students before and after the exam were counted. At the same time, the teaching evaluation questionnaire was issued after the class to investigate and analyze the differences between the two teaching methods.

Results: In the two groups, their pre-class scores and after-class results demonstrated the after-class results were significantly higher than the pre-class scores ($p<0.01$). There was no significant difference between the two groups in the scores of pre-class testing ($p=0.48$). There was a significant difference between the two groups in the scores of after-class testing ($p<0.05$). The student survey demonstrated the "flipped" model had more advantages than the traditional teaching model, and the "flipped" model evaluated by students after teaching was exceed the pre-class expectations.

Conclusion: The "flipped" type of micro-course video classroom mode enhances the students' mastery of the knowledge in the classroom objectively and subjectively. By stimulating the participants' active learning potential and self-assessment, the quality of training for students is improved in a short teaching time.

Keywords: Micro-course video; Flipped class; Incontinence and enterostomal therapists; Teaching reform

Introduction

The "flip classroom" teaching mode of micro-course video is an autonomous teaching mode that has emerged in recent years and advocates students as the center. It not only attracts more and more attention worldwide, but also emphasizes the combination of practice and theory in medical education. This model is gradually promoted [1]. The teaching mode utilizes the interaction of the teaching and learning roles to promote independent learning and improve students' ability to master knowledge [2]. The challenges of teaching this course includes: learner's lack of urology knowledge and limited teaching hours. A lot of students complained that this course was difficult [3,4]. To this end, this study explores the use of flipping classroom teaching mode to make up for the traditional teaching. We designed and applied the micro-course video combination problem discussion teaching method applied to urinary incontinence teaching, through the practice and investigation of the 2017-2018 school years. This model has improved the students' knowledge of urinary incontinence objectively and subjectively, and initially explored a solution to the contradiction between the short teaching time of incontinence enterostomal therapist and the improvement of the quality of training.

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Objects and Methods

Study subjects

The students of the International Incontinence Enterostomal Therapists School of semester 2017 and 2018 were selected as subjects. A total of 24 students in 2017 were used as a control group, and 30 students in 2018 were used as experimental group. All participants were informed and agreed to participate in the teaching survey. The questionnaire collected geographical information about the students including age, gender, education level, work experience and so on.

Research methods

This study adopts exploratory research to specifically analyze the differences between the "flip classroom" teaching mode based on the micro-course video and the traditional teaching mode.

Teaching implementation

Preparation of the course: Recorded 5 videos about urinary incontinence clinic and urodynamic examination, each video is 10 to 20 minutes in length, mainly including the following video contents: 1) The main patient condition and characteristics of urinary incontinence clinic, 2) Free urine flow rate detection and case study, 3) urinary flow dynamics examination procedures, 4) urodynamic examination technical points and case study, 5) clinic symptoms of urinary incontinence chronic disease management.

Course arrangement: According to the curriculum, the urinary incontinence is taught, and the students are tested before and after the class. The micro-course-based flip mode is applied to the experimental group: the students watched the micro-videos before class then took 10 minutes pre-study test at beginning of the class, the teacher lectured and answer questions for 20 minutes. Then the teacher presented the real case for discussion for 30 minutes, and then

the students took post-study test for 15 minutes. Last the student gave feedbacks and evaluated the course for 15 minutes.

Evaluation method

The pre- and post-test questions and after study feedback questionnaires were designed, including the pre- and post-study test, and self-evaluation and opinion forms for the students after class. Individual test scores were used as objective indicators to evaluate the teaching effect, and questionnaires were used as subjective indicators of teaching effects. This study used a self-designed questionnaire to investigate the subjects. The questionnaire was distributed and collected through the Questionnaire Star, an online questionnaire tool.

Statistical analysis

Statistical analysis was performed using SPSS 17.0 software. The count data was expressed as a number or percentage, and X^2 test or descriptive statistical analysis was performed. The measurement data were expressed as mean ± standard deviation SD, and the t-test was performed before and after the test, or between groups.

Results

Teacher's evaluation of students' classroom learning and classroom performance

Comparison of classroom test results (Table 1): The experimental group had 28 and 29 test results before and after the class, respectively, with 2 and 1 missing; the control group had 22 and 23 test results before and after the class, with 3 and 2 missing respectively. The results showed that the scores of the experimental group and the control group were statistically different (*P<0.01), indicating that both teaching modes can significantly improve the students' ability to master the content. There was no significant difference between the experimental group and the control group (P=0.95) on pre-study scores, suggesting that the basic knowledge of urinary incontinence before class may be on the same level; for the after-class results, there are significant differences between the two groups (†P=0.018), suggesting that the "flip classroom" teaching mode of the micro-course video can better improve the students' objective master of the teaching content.

Teacher's evaluation of students' classroom performance (Table 2): The teacher evaluated the performance of the student's classroom learning process, which was graded in Excellent, Good, Medium and Poor. The evaluation was based on if the students were focused in class, students' participation in asking and answering questions, overall learning atmosphere and classroom discipline. In the calculation of variance statistics, the above-mentioned four-level number of people did not pass, and the excellent and good grades were further merged into the A-level, and the middle and the poor grades were merged into the B-level, forming a two-level comparison. The results showed that there was no statistical difference in classroom performance (P=0.146), although the excellent and good proportions of the experimental group (Grade A) were indeed much higher than the control group.

Pre-class and after-class evaluation of the "Flip Classroom" teaching mode based on the micro-course video

Students' pre-class survey results on the micro-curriculum model (Table 3): Through the short pre-class Questionnaire Star survey, students were investigated about the understanding of flipped class and the urinary incontinence before class, and 29 questionnaires were valid.

The results of the students' after-school evaluation of the micro-courses (Table 4): Through the online Questionnaire Star survey after the class, the students were investigated and evaluated after the flipped class, and 30 valid questionnaires were collected.

Table 1: Comparison of pre- and post-class scores of students and comparison between experimental group and control group (X ± SD).

	Pre-class grades	Post-class grades
Experimental group (n=30)	21.296 ± 12.378	70.821 ± 14.121*†
Control group (n=24)	22.667 ± 15.835	61.636 ± 11.782*

*P<0.01 *vs.* Before; †P<0.05 *vs.* Control

Table 2: Teacher's evaluation of students' performance in class.

Grades/Number	A		B	
	Excellent	Good	Medium	Poor
Experimental group (n=30)	8 (27%)	15 (50%)	5 (17%)	2 (6`
	23 (77%)		7 (23%)	
Control group (n=24)	2 (9%)	11 (46%)	8 (33%)	3 (12%)
	13 (54%)		11 (46%)	
Chi-square (P value)	2.109 (0.146)			

Table 3: Pre-class survey of the "Flip Classroom" teaching mode of the micro-course video of urinary incontinence (n=29).

Item	100%	75%	50%	25%	0%
Clinical experience of urinary incontinence	0	3 (10%)	7 (24%)	6 (21%)	13 (45%)
Expected proportion of urinary incontinence courses	0	2 (7%)	5 (17%)	15 (52%)	7 (24%)
Knowledge of the micro-course	8 (27%)	4 (14%)	13 (45%)	4 (14%)	0
Expected acceptance of micro-courses	10 (35%)	12 (41%)	7 (24%)	0	0
Expect micro-courses to be better than traditional lessons	11 (38%)	11 (38%)	6 (21%)	1 (3%)	0

Table 4: Investigation and evaluation of micro-course teaching after urinary incontinence (n=30).

Items	100%	75%	50%	25%	0%
Understanding of Micro-course video	1 (3%)	6 (20%)	16 (53%)	5 (17%)	2 (7%)
Understanding of Teacher's lecture	2 (7%)	11 (37%)	10 (33%)	6 (20%)	1 (3%)
Degree of meet the expectation	1 (3%)	10 (33%)	11 (37%)	7 (23%)	1 (3%)
Degree of flipped class better than traditional class	2 (7%)	9 (30%)	10 (33%)	8 (27%)	1 (3%)
The degree of flipped class helps understanding of pre class questions	3 (10%)	13 (43%)	8 (27%)	5 (17%)	1 (3%)
The extent to which this micro-class needs improvement	1 (3%)	4% (13%)	11 (37%)	11% (37%)	3 (10%)
I hope the teacher will increase or decrease the time of the explanation.	7% (23%)	19% (63%)	4% (13%)	0	0
Acceptance degree of flipped class	4 (13%)	11% (37%)	8 (27%)	6 (20%)	1 (3%)

Discussion

Micro-class flipping classroom can improve students' mastery of urinary incontinence courses. It is generally believed that flipping classroom teaching mode can improve students' interest in learning and can improve students' achievement significantly [6]. In our research, it was found that compared with the traditional teaching, the

micro-class flipping mode of the experimental group had a significant improvement in the post-study test (†P=0.018), and the average score improved by nearly 10 points. It shows that this model is conducive to students' understanding of the urinary incontinence knowledge, and the teaching efficiency is greatly improved. In the student micro-class after-class questionnaire, 70% of the students also believe that the micro-course has the comparative advantage of the traditional class. 70% of the students think that it excelled their expectations. In the flipping mode of the micro-course combined with the problem-based discussion teaching, it is more conducive to cultivating students' learning and clinical thinking about urinary incontinence. It can effectively reduce the time and pressure of after-school review. In addition, the online urinary incontinence videos are easily accessible anywhere and anytime [7]. Our survey shows that 77% of students in the after-school survey have a greater acceptance of the model.

Micro-class flipping classroom can improve teachers' evaluation of students. The micro-course video combination discussion can promote the initiative and interaction of both teachers and learners [8]. Our model was designed to improve students' problem solving ability. For the teacher, follow the video and student discussion, there will be more free time to observe, evaluate the students, and give feedbacks. From the teacher's evaluation, the proportion of students with excellent and good grades is not statistically different, but the actual numerical ratio is more than 10% to 20%. The experimental group is higher than the control group. One of the possible reasons for our speculation is chi-square test. The method test requires a larger sample size, so the statistical result is P=0.146.

Micro-class flipping classroom need to improve in the training of urinary incontinence courses there are also some shortcomings in the application of micro-class flipping classrooms [9]. For our research, from the open question in the questionnaire on how to improve the micro-curriculum model, the main recommendations include that the basic knowledge of urodynamic examination in urinary incontinence video content is insufficient, and difficult understand, and teachers needs to pause further explain the contents; The curriculum is too tight and stressful; the teacher should interprets and discusses the problem with the videos. These questions are also supported by other questions in the questionnaire, mainly because 66% of students have no or little clinical experience related to urinary incontinence, lack of relevant clinical experience reserves before urinary incontinence, and the proportion of urinary incontinence courses is low in the whole training course. Time is relatively limited. The exploration of micro-curriculum mode is also one of the ways to try to solve these problems. It also partially solves this problem objectively and subjectively. What is interesting is the student's micro-curriculum mode. To the extent of acceptance, 23% of students have lowered the expected ratio. On the one hand, there may be too high expectations before the students' micro-courses. On the other hand, we also suggest that our micro-curriculum model needs further improvement in specific details to facilitate students' learning.

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