A Study of Blended Learning Using the Smart Class Teaching Module on Psychosocial Dysfunction Course During the Training of Undergraduate Occupational Therapy Students in China

Background: Online blended learning, also known as “smart classes”, has benefits when compared with traditional teaching methods that use books and lectures. This study aimed to compare the use of the Smart Class teaching module with traditional teaching on the topic of psychosocial dysfunction during the training of undergraduate occupational therapy (OT) students in China.

Material/Methods: We recruited Grade 2017 OT students as the Smart Class teaching module group and Grade 2016 OT students as the Traditional Class teaching module group to participate in the study. The objective evaluation (assignment score, practical exam score, written exam score, and final score) and subjective evaluation (data from student questionnaires and information from interviews with the lead teacher and assistant teachers) were performed in both groups.

Results: No significant difference was found in the final scores ($P=0.874$) and students’ questionnaire results between the 2 groups. However, data from the student questionnaires and teacher interviews indicated a preference for combining the Smart Class teaching module and the Traditional Class teaching module.

Conclusions: The advantage of the Smart Class teaching module is that it can effectively integrate excellent teaching resources across geographical restrictions and it is conducive to promoting independent learning for students and all-around supervision for teaching. The Smart Class teaching module was comparable to traditional teaching methods for the training of undergraduate OT students in China, but was preferred by the students.

Keywords: Educational Measurement • Occupational Therapy • Teaching

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Background

Rehabilitation therapy started in the late 1980s in China. Medical professionals training in this field have experienced a procession from short-term training to formal academic education, yet the development is still in its infancy [1]. As an important branch of rehabilitation therapy, occupational therapy (OT) was not launched in professional direction education in Chinese universities until 2002 [2]. Only 7 universities have been accredited by the World Federation of Occupational Therapists (WFOT) for occupational therapy [3]. There is an urgent demand for occupational therapy education in line with international standards. However, there remains a gap between OT education in mainland China and international standards [4,5]. Scholars are now asking how to quickly improve OT education in mainland China [6].

The OT major in Guangzhou Medical University began in 2016 [7]. There is a lack of teaching experience in OT courses. The faculty’s composition is relatively young; there is a shortage of intermediate and senior teachers with rich teaching experience, especially in the OT courses related to psychosocial conditions. The Hong Kong Polytechnic University (PolyU) is adjacent to Guangzhou and is a cooperative unit of rehabilitation medicine education with the Guangzhou Medical University, and was ranked 75th in the QS World University Rankings in 2021 [8]. The Department of Rehabilitation Sciences of PolyU has 44 teaching staff, ranging from assistant professors to chief professors [9]. The WFOT accredited its OT program in the early 1980s. PolyU has strong faculty, rich teaching experience, and geographical proximity, which lays a solid foundation for the regional sharing of educational resources between the 2 universities. In recent years, our university has been cooperating with the Department of Rehabilitation Sciences of PolyU in course teaching. It has achieved progress in improving the quality of teaching and promoting local teachers’ training. However, the main problem in implementing the Traditional Class teaching modules is that the teachers needed to travel from Hong Kong to Guangzhou to teach undergraduate students, which was associated with intensive teaching periods throughout the weekend. As a result: (i) students had insufficient time to preview or digest the knowledge that they should master or had learned; (ii) teachers had to complete extra work for class preparation within a short time; (iii) there was a lack of interaction with students, which was not conducive to adjusting further teaching content according to the students’ feedback; and (iv) Hong Kong teachers had a lengthy commute, increasing the non-teaching costs.

Online blended learning, also referred to as “smart classes”, have benefits when compared with traditional teaching methods that use books and lectures, particularly for students who cannot access teaching centers. There have been several developments in online teaching modules, one of which is the Smart Class, an efficient and intelligent teaching and learning platform built through the Chaoxing Fanya application system (http://fanya.chaoxing.com/portal). It can provide two-way interactive learning environments for students and teachers, relying on modern information technology and network media, and covering teaching resources, real-time classroom, and interactive communication [10-12]. Teachers can carry out distance teaching, and students can learn flexibly and independently [13]. More importantly, “Smart Class” has powerful learning behavior management and resource referral functions [14]. While teachers carry out rich and vivid personalized teaching, they can also perform comprehensive supervision of students by “pre-class preview”, “interaction in-class teaching”, and “after-class review” [15]. Pei et al [16] reviewed 16 articles and found that compared to traditional classes, online classes present advantages to enhance undergraduates’ knowledge and skills and thus can be considered as a potential method in undergraduate medical teaching. However, the effectiveness of online learning is also influenced by many factors, including internal and external factors such as course characteristics, learning goals, and materials [17-19]. Therefore, this study aimed to compare the use of the Smart Class teaching module with traditional teaching on the topic of psychosocial dysfunction during the training of undergraduate OT students in China.

Material and Methods

Subjects

OT students in Grade 2016 and Grade 2017 from the Fifth Affiliated College of Guangzhou Medical University were recruited to participate in the study. Inclusion criteria were: (i) age from 18 to 23 years old, (ii) a third-year undergraduate student of OT, (iii) completed the course of Occupational Therapy for Psychosocial Dysfunction, and (iv) volunteered and agreed to participate in the study.

This study was approved by the Ethics Association of the Fifth Affiliated Hospital of Guangzhou Medical University and performed in accordance with the Declaration of Helsinki. All the participants answered the questionnaire after completing the course voluntarily. The investigators presented an introductory paragraph that informed participants of the study’s aims, the confidentiality of their responses, and that they could refuse to answer any questions or withdraw from the study at any time (the details can be found in the Supplementary Material 1) [20]. All data and personal information involved in this study were collected by specific researchers and stored in locked areas, and sensitive documents were never left unattended in public locations.
Intervention

Grade 2017 OT students (the Smart Class teaching module group) completed the Smart Class teaching module. In contrast, Grade 2016 OT students (the Traditional Class teaching module group) completed the Traditional Class teaching module. Both groups took the Occupational Therapy for Psychosocial Dysfunction course, which had 42 class hours, including 18 theoretical class hours and 24 practical class hours. The lead teacher was from the Department of Rehabilitation Science, Hong Kong Polytechnic University was responsible for most of the theoretical and practical class teaching. Three young teachers from Guangzhou Medical University acted as assistant teachers, and were mainly responsible for the assistant teaching of practical classes, teaching administration arrangement, and examination work. The same course, textbook, class hours, teaching content, syllabus, and teacher team were used for the 2 groups. In the Smart Class teaching module group, the lead teacher carried out long-distance teaching from Hong Kong, while the assistant teachers assisted the teaching in Guangzhou through the Chaoxing Online Teaching Information Platform (http://i.mooc.chaoxing.com and http://gzhmu.fanya.chaoxing.com/portal). The whole teaching process was divided into: (i) Posted class requirements and studying materials before having class; (ii) During class, conducted activities such as discussion, questions, and answers to provide an active atmosphere in the theoretical classes, and created an online interactive space for teachers to demonstrate and supervise, for students to practice and discuss in the practical classes; (iii) Issued assignments, group discussion topics, extracurricular study resources, and other tasks after class, and teachers graded and answered questions for students to promote consolidating knowledge. The teaching time arrangement was consistent with the conventional arrangement and was carried out regularly, about 4 class hours per week. For the Traditional Class teaching group, the lead teacher traveled from Hong Kong to Guangzhou on weekends to teach face-to-face with students for 12 class hours per day. The whole course was taught over 3 weekends (6 days). The assistant teachers assisted the class teaching and administration throughout. The key elements of the Smart Class teaching module and the Traditional Class teaching module are diagrammed in Figure 1.

Assessments

The final course score consists of assignment, practical exam, and written exam, accounting for 10%, 20%, and 70% of the total score, respectively. The assignment and practical exam were assessed by teachers, with a full score of 100. The written exam, with a full score of 100, was designed by the teachers, which included single-answer, multiple-answer, terminology-explanation, short answer, and case analysis questions. Students from both teaching modules completed the 3 parts. The degree of difficulty for the assignments and exams was the same for the 2 groups.

Figure 1. The key elements of the Smart Class teaching module and the Traditional Class teaching module are diagramed.
Student Questionnaire

After the Occupational Therapy for Psychosocial Dysfunction course was completed, the students under the 2 teaching modules (Smart Class teaching module and Traditional Class teaching module) were asked to complete the same online questionnaire voluntarily and anonymously (Student Questionnaire, see Supplementary Material 1 for details). The Student Questionnaire included basic student information (grade, age, and sex) and 17 multiple-choice questions about the Occupational Therapy for Psychosocial Dysfunction course, which could be grouped into 4 main topics: (i) pre-class preview (Question 4 to Question 6); (ii) in-class learning (Question 7 to Question 13); (iii) after-class review (Question 14 to Question 16); and (iv) course satisfaction (Question 17 to Question 20). The participants answered each of the 15 questions using five-point Likert-type scales [21,22], except for Question 13 and Question 19. Question 13 is a multiple-answer question to investigate what students think is an effective way to interact in class, while Question 19 is a single-answer question to survey which way students like to have class.

The Creative Research Systems survey software (https://www.surveysystem.com/sscalc.htm#one), an online Sample Size Calculator, was used to determine the number of valid questionnaires required to get results that reflect the target populations. We set a confidence level of 95% and a confidence interval of 5, which corresponded to a required sample size of at least 36.

Cronbach’s alpha coefficient was greater than 0.70, indicating an acceptable level of the questionnaire’s reliability [23]. Meanwhile, the questionnaire’s validity was assessed by Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett’s sphericity test. The KMO value should be more than 0.60, and the statistically significant value should be less than 0.001 (P<0.001), which indicates that the sampling was sufficient and data had a normal distribution [24].

Teacher Interview

The lead teacher and assistant teachers were invited to complete a semi-structured interview after the Occupational Therapy for Psychosocial Dysfunction course had finished [25]. The interview outline focused on class preparation, teaching effect, teaching implementation, and teaching innovation. Sessions were recorded and transcribed verbatim [26]. Transcripts were read in their entirety several times to summarize the main points (interview outline and answer main points, see Supplementary Material 2 for details), examine the teaching effect, and explore teaching innovations.

Statistical Analysis

Statistical analysis was carried out using IBM SPSS 25.0 software. Normally distributed data are represented by the mean±standard deviation. The median expressed measurement data that did not conform to the normal distribution and counting data are represented by constituent ratio or rate. The final scores data from 2 groups that conform to the normal distribution and the homogeneity of variance were compared using an independent samples t test. The answers A to E of 15 questions in the Student Questionnaire were assigned values of 1 to 5. The lower values indicate a worse or more negative situation versus the higher values indicating a better or more positive situation [27]. The average score was calculated within the 4 thematic categories, and then the 2 groups were statistically analyzed with a non-parametric rank-sum test [28]. P values <0.05 were considered statistically significant.

Results

Baseline

In this study, 40 OT students were recruited, of which 16 students of Grade 2017 participated in the Smart Class teaching module group (age, 20.75±0.68 years old; 2 male students and 14 female students), while 24 students of Grade 2016 participated in the Traditional Class teaching module group (age, 20.54±0.51 years old; 3 male students and 21 female students). There were no statistically significant differences in age (P=0.891) or gender ratio (P=0.276) between the 2 groups (Table 1).

Course Score

No significant difference in written exam score (Smart Class teaching module: 74.00±7.15, Traditional Class teaching module: 75.88±10.39, P=0.543) or the final score (Smart Class teaching module: 77.63±5.16, Traditional Class teaching module: 78.00±8.25, P=0.874) was found when comparing the Smart Class teaching module group and Traditional Class teaching module group. However, there were statistically significant differences in assignment score (Smart Class teaching module: 86.25±2.67, Traditional Class teaching module: 83.17±4.43, P=0.017) and practical exam score (Smart Class teaching module: 86.00±1.75, Traditional Class teaching module: 82.83±5.75, P=0.040) when comparing the 2 groups (Table 2), which showed that scores of the Smart Class teaching module groups were higher than those of the Traditional Class teaching module.

Student Questionnaire

Forty questionnaires were distributed using a free online questionnaire platform (WENJUANXING, https://www.wjx.cn/) to
occupational therapy students, and 40 valid questionnaires were returned, of which 16 were from the Smart Class teaching module group and 24 were from the Traditional Class teaching module group. We conducted reliability and validity tests for the Student Questionnaire. The alpha coefficient was 0.889, which indicated good internal reliability. The KMO value was 0.755, and Bartlett's sphericity value was less than 0.001, indicating that the questionnaire's validity was good.

No statistically significant difference was found in pre-class preview, in-class learning, after-class review, or course satisfaction between the Smart Class teaching module and the Traditional Class teaching module (Table 3). However, the top 3 student responses to the in-class effective interaction methods question were the same between the 2 groups. The responses of active expression, class interaction, and group discussion were 75%, 68.5%, and 68.5%, respectively, to the Smart Class teaching module group; in comparison, for the Traditional Class teaching module, these values were 54.13%, 83.33%, and 83.33%, respectively. There were only slight differences in these proportions (Figure 2). Both groups responded to “Take theoretical classes for online teaching, 4 hours per week; take practical classes offline intensively over 2-3 weekends”, which accounts for 50% in the Smart Class teaching module and 45.83% in the Traditional Class teaching module (Figure 3).

Table 1. Basic characteristics of OT students in the 2 different teaching modules.

| Items                  | The Smart Class teaching module | The Traditional Class teaching module | P-value |
|------------------------|---------------------------------|---------------------------------------|---------|
| Grade                  | Grade 2017                      | Grade 2016                            | NA      |
| Student number         | 16                              | 24                                    | NA      |
| Sex (Male/Female)      | 2/14                            | 3/21                                  | 0.891   |
| Age (years)            | 20.75±0.68                      | 20.54±0.51                           | 0.276   |

No significant differences were found between Smart class teaching module group and the Traditional Class teaching module group in sex and age. Values are presented as a number or mean±standard deviation. Statistical significance was set as P<0.05 and marked in bold. OT – occupational therapy. NA – not applicable.

Table 2. The differences in course scores between the 2 types of teaching modules.

| Items                | The Smart Class teaching module | The Traditional Class teaching module | P-value |
|----------------------|---------------------------------|---------------------------------------|---------|
| Assignment score     | 86.25±2.67                      | 83.17±4.43                           | 0.017*  |
| Practical exam score | 86.00±1.75                      | 82.83±5.75                           | 0.040*  |
| Written exam score   | 74.00±7.15                      | 75.88±10.39                          | 0.534   |
| Final score          | 77.63±5.16                      | 78.00±8.25                           | 0.874   |

The higher assignment score and practical exam score in the Smart Class teaching module group than those in the Traditional Class teaching module group. Values are presented as a number or mean±standard deviation. Statistical significance was set as P<0.05 and marked in bold. The final score consisted of 10% of assignment score, 20% of practical exam score and 70% of written exam score.

Table 3. The results of the questionnaire between the 2 types of teaching modules.

| Items                   | The Smart Class teaching module | The Traditional Class teaching module | P-value |
|-------------------------|---------------------------------|---------------------------------------|---------|
| Pre-class preview       | 20.97                           | 20.19                                 | 0.833   |
| In-class learning       | 19.94                           | 20.88                                 | 0.802   |
| After-class review      | 23.13                           | 18.75                                 | 0.231   |
| Course satisfaction     | 21.00                           | 20.17                                 | 0.819   |

No significant differences were found between Smart class teaching module group and the Traditional Class teaching module group in different aspects in questionnaire.
Figure 2. The most effective in-class interaction methods were selected by students. The top 3 student responses in both groups were active expression, class interaction, and group discussion.

Figure 3. The optimal teaching arrangement was suggested by students. 50% in the Smart Class teaching module group and 45.83% in the Traditional Class teaching module group chose the optimal teaching arrangement of “Take theoretical classes for online teaching, 4 hours per week; take practical classes offline intensively over 2-3 weekends”.

The Smart Class teaching module
The Traditional Class teaching module
The lead teacher and assistant teachers considered that both teaching modules had advantages and disadvantages. Compared with the Traditional Class teaching module, the Smart Class teaching module helps make full use of teaching resources, overcome the geographical limitations, arrange teaching schedule regularly, and promote independent learning among the students. However, the Smart Class teaching module’s implementation still relies on a smooth network and stable application platform. Moreover, it is not conducive to peer exercises for small and face-to-face interactions in the practice courses. They all suggested that the theoretical classes should be taught regularly with the Smart Class teaching module and the practical classes should be taught intensively with the Traditional Class teaching module. Meanwhile, assistant teachers believed that the application of the Smart Class teaching module should be actively promoted in the joint teaching of Guangdong, Hong Kong, and Macao, and taking full advantage of excellent teaching resources from Guangdong, Hong Kong, and Macao to improve the teaching quality of the weak local courses and the teaching skill of local young teachers.

Discussion

Based on objective evaluation methodology (assignment score, practical exam score, written exam score, and final score), combined with subjective evaluation methodology (data of student questionnaires and information from interviews with the lead teacher and assistant teachers), this study explored the application effect of Smart Class teaching module on integrating cross-regional quality teaching resources in OT undergraduate teaching. We detected no significant difference in the final scores and students’ questionnaire results between the Traditional Class teaching module and the Smart Class teaching module. However, both the data of the student questionnaires and teacher interviews indicated a preference for combining the Smart Class teaching module and the Traditional Class teaching module in the Occupational Therapy for Psychosocial Dysfunction course.

No statistically significant differences were found in the final score between the 2 groups, indicating that the 2 teaching modules led to a similar effect. However, the comparison results of assignment and practical exam scores showed that the Smart Class teaching module group has a slight advantage over the Traditional Class teaching module group. There are 2 probable reasons for this. First, students had sufficient time to comprehend knowledge learned in class and completed the assignments step-by-step [29,30], and make full preparation for the practical exam according to regular teaching under the Smart Class teaching module. Second, in the process of completing assignments, students could communicate and interact with teachers through the Smart Class teaching platform, which was not limited by region or time [31]. Nevertheless, Pei et al [16] concluded that online learning and offline learning have similar teaching effects. Online learning has its own advantages and disadvantages. The Smart Class teaching module will weaken students’ teamwork ability and instant reaction in practical performance [32].

There was no statistically significant difference in pre-class preview, in-class learning, after-class review, and course satisfaction when comparing the Smart Class teaching module and the Traditional Class teaching module for the Student Questionnaire results. According to the teachers’ interview results, in terms of teaching implementation, it was believed that the Smart Class teaching module could be used to solve the problem of geographical limitation between Guangdong and Hong Kong, which was more conducive to the regular arrangement of theoretical class hours, thus making up for the main disadvantages of cross-regional teaching under the Traditional Class teaching module. Khadijah Mukhtar et al also considered the primary problem that online classes can solve is physical locations of courses. Both teachers and students can participate in the class by remote learning wherever they are [33]. The Smart Class teaching module was also beneficial to continue normal teaching activities during the pandemic period [10,34]. It can also enable students to have more time to digest, analyze, and consolidate their knowledge. However, the Smart Class teaching module weakened students’ teamwork ability and immediate reaction, and limited the practical contents and types; for an instant, it could not carry out interactive sports group activities. Therefore, the students’ questionnaire survey and teachers’ interview also suggested that the theoretical class should regularly use the Smart Class teaching module. In contrast, the practical class should intensively use the Traditional Class teaching module in future teaching.

Moreover, the Smart Class teaching module should be further improved [35]. For instance, the implementation of this teaching module greatly depends on the network’s stability and fluency. During the class period, there were some phenomena that affect the effect of online teachings, such as network delay and lag [32].

Limitations

The number of our valid questionnaires was within the range of the sample size, but it is still a small size. That was due to the small class teaching for the OT students in Occupational Therapy for Psychosocial Dysfunction course. A multi-center study will be conducted in the future to increase the total number of subjects. Moreover, although there was no significant difference in gender ratio between the 2 groups in our study,
there were more female students than male students in general due to the characteristics of OT major enrollment. Future research on potential factors of gender difference is needed. Also, due to the pandemic, further research for the blended teaching model combined of Smart Class teaching module and Traditional Class teaching module cannot be immediately carried out. However, we will develop the further study in the future as conditions permit.

Conclusions

The Smart Class teaching module and the Traditional Class teaching module each have advantages and disadvantages. The advantage of the Smart Class teaching module is that it can effectively integrate excellent teaching resources across geographical restrictions, and it is conducive to promoting independent learning for students and all-around supervision for teaching. It also improves the teaching quality of the weak courses and teaching skills of young teachers locally. Nevertheless, in practical courses, the Smart Class teaching module struggles to replace the advantages of the Traditional Class teaching module. Meanwhile, we suggest regularly using the Smart Class teaching module in theoretical classes, while intensively using the Traditional Class teaching module in practical classes. Our findings showed the use of the Smart Class online teaching module was comparable with traditional teaching methods for the training of undergraduate OT students in China, but was preferred by the students.

Conflict of interest

None.

Supplementary Materials

Supplementary Material 1

Student Questionnaire for Occupational Therapy for Psychosocial Dysfunction study

Informed Consent for the Subject

Dear student/subject for Occupational Therapy for Psychosocial Dysfunction study,
Greetings!

This is a student questionnaire for Occupational Therapy for Psychosocial Dysfunction study in Guangzhou Medical University, which is used to understand the study situation and to help guide further teaching practice.

Our study was approved by the Ethics Association of the Fifth Affiliated Hospital of Guangzhou Medical University and is in accordance with its ethical standards. If you have any other questions, please contact the research executive Haining Ou (Tel. 86 020 82516054).

Research Content and Explanation

This Student Questionnaire includes a student’s basic information (grade, age, sex) as well as 17 multiple-choice questions about your Occupational Therapy for Psychosocial Dysfunction course. The whole questionnaire will take you about 10 minutes to complete. Please understand that your careful and truthful answers are essential to scientific conclusions. You do not have to guess the design of the study or the intention of the question, and there is no right or wrong answer.

Confidentiality Principle

This study is not concern the subjects’ personal information, and there are no sensitive issues involved. All data in this study will be used for scientific purposes only. All data and personal information involved in this study were collected by specific researcher and stored in locked areas. Never leave sensitive documents unattended in public locations.
Participants' benefit
Since this research is used for teaching reform and there is no economic benefit for anyone, no corresponding compensation is provided. Because of confidentiality, do NOT put your signature on the questionnaire. If you continue to the next page, that means you have read the above and volunteered to participate in this study. Thank you for your patience and reply.

Question 1: Which Grade are you in?
A. Grade 2016     B. Grade 2017

Question 2: Sex:
A. Male     B. Female

Question 3: How old are you?

Question 4: Would you preview the content of the course?
A. Strongly disagree
B. Disagree
C. Normal
D. Agree
E. Strongly agree

Question 5: What was your average pre-class preview time for each class hour:
A. Within 0.5 hour
B. 0.5-1 hour (including 0.5 hour)
C. 1-1.5 hours (including 1 hour)
D. 1.5-2 hours (including 1.5 hours)
E. Above 2 hours

Question 6: Do you think that the pre-class preview materials are sufficient and helpful for learning?
A. Strongly disagree
B. Disagree
C. Normal
D. Agree
E. Strongly agree

Question 7: Do you enjoy the Occupational Therapy for Psychosocial Dysfunction study?
A. Strongly disagree
B. Disagree
C. Normal
D. Agree
E. Strongly agree

Question 8: Do you think teachers’ teaching methods were varied during class?
A. Strongly disagree
B. Disagree
C. Normal
D. Agree
E. Strongly agree

Question 9: What do you think about the interaction between teacher(s) and students in the class?
A. Very poor
B. Poor
C. Normal
D. Good
E. Excellent
Question 10: Have you taken the initiative to answer the teacher’s questions in class?
A. Never
B. Occasionally
C. Normal
C. Sometimes
E. Always

Question 11: Have you taken the initiative to ask the teacher in class?
A. Never
B. Occasionally
C. Normal
D. Sometimes
E. Always

Question 12: Have you interacted with other students in a practical class?
A. Never
B. Occasionally
C. Normal
D. Sometimes
E. Always

Question 13: What is an effective method of interaction during class, in your opinion? (Multiple choices)
A. Attendance tracing
B. Class interaction
C. Questioning by the roll call
D. Active expression
E. Group discussion
F. Online quiz
G. Forum discussion
H. Other

Question 14: Were you able to complete assignments well?
A. Strongly disagree
B. Disagree
C. Normal
D. Agree
E. Strongly agree

Question 15: Did you review and consolidate the knowledge you have learned in time after class?
A. Never
B. Occasionally
C. Normal
D. Sometimes
E. Always

Question 16: What was your average after-class review time for each class hour?
A. Within 0.5 hour
B. 0.5-1 hour (including 0.5 hour)
C. 1-1.5 hours (including 1 hour)
D. 1.5-2 hours (including 1.5 hours)
E. Above 2 hours
Question 17: Were you able to adapt to this teaching module?
A. Strongly disagree
B. Disagree
C. Normal
D. Agree
E. Strongly agree

Question 18: Do you satisfy with the teacher's teaching?
A. Strongly disagree
B. Disagree
C. Normal
D. Agree
E. Strongly agree

Question 19: What teaching arrangement you will suggest?
A. Traditional Class teaching module for both theoretical and practical classes within intensively two to three weekends
B. Smart Class teaching module for theoretical classes performing regularity (4 class hours per week) and Traditional Class teaching module for practical classes within intensively two to three weekends
C. Smart Class teaching module for both theoretical and practical classes performing regularity (4 class-hours per week)
D. Smart Class teaching module for both theoretical and practical classes within intensively two to three weekends
E. Other

Question 20: Do you think that the teaching module, of which combines teachers between Hong Kong and Guangzhou Medical University, would help you with study and communication?
A. Strongly disagree
B. Disagree
C. Normal
D. Agree
E. Strongly agree

Supplementary Material 2

The Outline of Teachers Interview and Answer Points for Occupational Therapy for Psychosocial Dysfunction teaching

Date of interview:

Interview format: □ Online Interview □ Face to face Interview

Interviewee: □ Lead teacher □ Assistant Teacher

Question 1: What do you think about the impact of different teaching modules (The Smart Class Teaching Module and The Traditional Class Teaching Module) on teacher's lesson preparation?

Lead teacher thought that, for teachers to prepare lessons, the Smart Class teaching module is better than the Traditional Class teaching module, mainly reflected in (i) the Smart Class teaching module can provide plenty of teaching and learning resources, create a platform for students to learn independently pre-class, in-class and after-class; (ii) Compared with the disadvantages of intensive teaching and lesson preparation caused by the geographical restrictions of Guangdong and Hong Kong in the Traditional Class teaching module, the Smart Class teaching module can teach and prepare lessons more regularly, which is helpful for teachers to make real-time adjustments to the next teaching and lesson preparation according to the last teaching effect.

Assistant teachers believed that, the Smart Class teaching module was conducive to the assistant teachers gave feedback of teaching effect to the lead teacher and helped the lead teacher to adjust the teaching method and content of the next class in time.
Questions 2: What do you think about the differences in teaching effect between different teaching modules (The Smart Class Teaching Module and The Traditional Class Teaching Module)?

Both lead teacher and assistant teachers believed that the two teaching modules have their own advantages and disadvantages in terms of teaching effects.

The lead teacher believed that by comparing with the Traditional Class teaching module, the Smart Class teaching module is conducive to progressive teaching, and gradual mastery of knowledge for students, the implementation of personalized teaching, students can make use of learning resources independently in preview and review, which is helpful for teachers to supervise the entire learning process of students. However, the practical classes of Occupational Therapy for Psychosocial Dysfunction need to be organized a large number of group therapy exercises, and it was difficult to realize online demonstration, interaction and guidance in the Smart Class teaching module.

The assistant teachers thought that the Smart Class teaching module was beneficial to assist the lead teacher to supervise the entire learning process of students, but the implementation and guidance effect of the practical class was poor.

Questions 3: What do you think about the differences of actual implementation in different teaching modules (The Smart Class Teaching Module and The Traditional Class Teaching Module)?

Both the lead teacher and assistant teachers believed that compared with the Traditional Class teaching module, the Smart Class teaching module could overcome geographical restrictions, save the time cost of the lecturer’s travel between Guangdong and Hong Kong, facilitate regular teaching schedules, and avoid the learning pressure of intensive teaching. However, the implementation of it still relies on a smooth network and a stable platform. Moreover, it is hard to carry out group practice and face-to-face interaction in practical classes.

Questions 4: What suggestions do you have for the teaching innovation of the Occupational Therapy for Psychosocial Dysfunction course?

The lead teacher thought that the two modules have their own advantages and disadvantages, and recommended that the theoretical classes adopt the Smart Class teaching module to teach regularly, and the practical classes adopt the Traditional Class teaching module for intensive teaching.

The assistant teachers believed that the application of the Smart Class teaching module in the joint teaching of Guangdong, Hong Kong and Macao should be actively promoted, and the excellent teaching resources of Guangdong, Hong Kong and Macao should be fully utilized to improve the teaching quality of weak local courses and the teaching level of local young teachers.

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