Design and Implementation of "SPOC Teaching Mode" for Fostering Creativity

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Abstract
SPOC (Small Private Online Course) has been widely used in higher education all over the world for its ease of access due to advanced information technology. Pursuing a successful future career, students in higher education need to develop their creativity and professional knowledge. Therefore, higher education should focus on the cultivation of creativity and professional knowledge through SPOC. This study aimed to establish a "SPOC Teaching Mode" for fostering students' creativity, by integrating online resources with classroom activities in order to develop a creative and professional education. The application of the mode is expected to stimulate students' engagements in autonomous learning activities, by practicing problem-finding and problem-solving skills, furthermore, facilitate students' professional knowledge learning as well as enhance their creativity in the professional field. Finally, a survey questionnaire was distributed to the participants in order to evaluate their views about the SPOC teaching mode.

Keywords: SPOC, Teaching mode, Creativity, Specialized knowledge, Higher education

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Introduction

Much attention has been given to creativity in education since 1950' (Craft,2001; Shaheen,2010). For a long time, creativity is considered as a vital ability for survival and career development. However, Jackson et al (2006) put forward a changed role of creativity, he referred that creativity used to be an advantage for few people, but now, it has become a necessity for humanity.

All the time researchers emphasize that creativity could be enhanced by learning (Davis & Rimm, 1985; Guilford, 1967; Karnes et al, 1961; Torrance, 1972). Guilford (1967) and Torrance (1963) found that creative thinking capacity could be enhanced by direct instructions. Karnes et al (1961) reported that educational design should be more flexible, such as enriched teaching programs and more reference materials. As Guilford (1967) claimed: "Like most behavior, the creative activity probably represents to some extent many learned skills. There may be limitations set on these skills by heredity, but I am convincing that through learnings one can extend the skills within those limitations." Then a certain number of training methods are developed to enhance individuals' creativity, such as brainstorming technique (Fryer,1996), thinking tools (De Bono,1987), etc. Admittedly, the arrival of the digital age is widely recognized as a new way to provide educators with more opportunities to carry on their teaching reforms. Hence, the integration of education and information technology elicited from the digital age is considered a careful intervention, which has a positive effect on enhancing creativity (Hargrove&Nietfeld, 2014; Bergmann&Sams, 2012).

In fact, SPOC has been widely used by educators from all over the world. For instance, Professor Fox at the University of California Berkeley successfully applied it to the "Cloud computing and software engineering" course in 2013. Similarly, Combéfis & Bibal (2014) successfully transferred the traditional course Informatics to MOOC by means of SPOC. There are hundreds of successful cases, and a big number of existing studies also provide evidence on SPOC's role in promoting students' capability.

Flipped classroom to foster creativity

Flipped classroom, also known as "inverted classroom"(Mason, Shuman & Cook, 2013), Bishop and Verleger (2013) defines flipped classroom as "a fresh pedagogical approach", it divides learning tasks into two parts, one part includes video lectures and other learning materials, the other part is group collaborations for solving problems in the classrooms. Many scholars have studied the impact of the flipped classroom on higher education, fortunately, more evidence support a positive influence (DeGrazia et al, 2012; Butt, 2014; Davies et al, 2013, etc.). For instance, DeGrazia et al (2012) found that students perform better in the traditional classroom, after the advanced preparations.

Design of the SPOC teaching mode

Theoretically, the flipped classroom may contribute to building the gap between theories and practice (Bergmann & Sam, 2012). Consequently, in this study, we are aimed to build up a blended teaching model, through the integration of online

teaching resources (SPOC) and classroom activities, with the purpose of enhancing creativity education and enriching professional education. we call this blended teaching mode the "SPOC teaching mode"(STM), and the application of the mode is expected to encourage students' autonomous learning in pre-class, and problem-finding and problem-solving techniques in class. Figure1 shows the SPOC teaching mode:
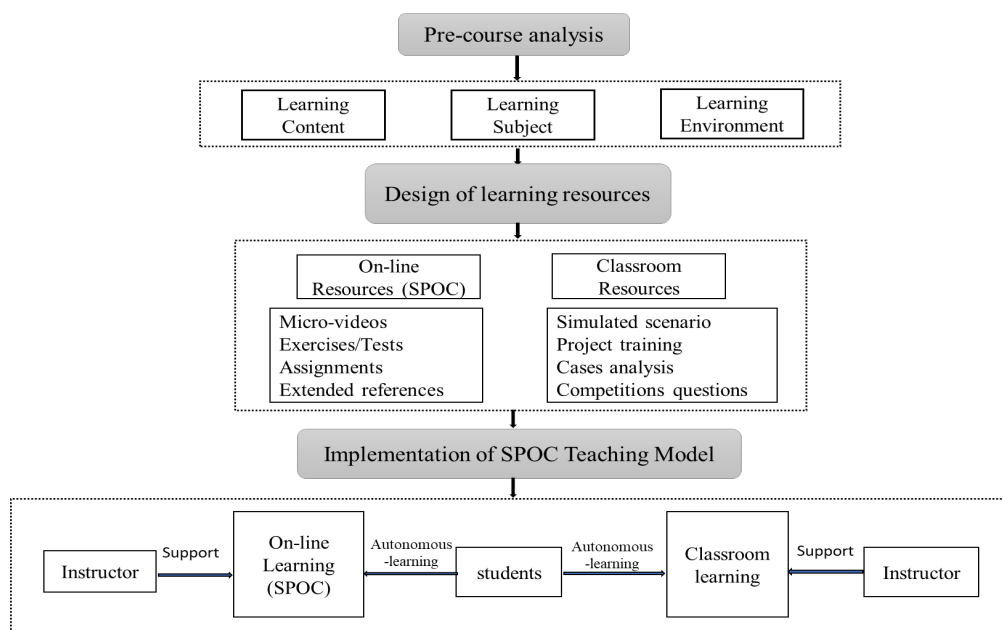

Figure 1: Design of SPOC Teaching Mode for fostering creativity

(1) Pre-course analysis

Before designing the SPOC teaching model, a pre-course analysis was conducted on the targeted learners. The analysis is mainly composed of three parts: analysis of the characteristics of students, analysis of learning content, and analysis of the learning environment.

(2) Design of teaching resources

Teaching resources are composed of on-line learning resources (SPOC) and classroom learning activities. On the one hand, on-line learning resources include micro-videos, exercises, tests, case analysis, and assignments. In addition, electronic books, syllabus, PPT presentation files could also be uploaded as extended resources for reference. On the other hand, classroom learning resources consist of case analysis, project practices, etc., and these tasks are accomplished by group collaborations.

Implementation of the SPOC Teaching Mode

The SPOC Teaching Mode was implemented in a Chinese University during the fall semester of 2019-2020, the targeted course is Principal of Accounting. This course is compulsory for all students enrolled in the School of Management; students typically take this course in the second grade. The course aims to provide students with basic

theories and skills for accounting booking, and which has a duration of 14 weeks. Each week, students are required to master one or two subjects.

Registration is required for students when enrolling in the course, and basic information of students will be recorded by the SPOC learning platform. We organized a series of learner-centered teaching activities, where instructors play a role of guidance. Task lists were designed according to teaching objectives and teaching progress. Learning tasks include watching micro-videos, case analysis, chapter practice, and tests. Every week, learning tasks were distributed to students on the platform, then students were required to utilize on-line resources autonomously. Specifically, we divided learning activities into two parts:

a. Pre-class activities: students were encouraged to view video lectures on the SPOC learning platform (Chaoxing Erya Learning Platform), which could help students to get an overall understanding of key conceptions and basic principal with ease. During this stage, students were responsible for their pre-class learning. After viewing videos, tests are followed, and students' responses were evaluated automatically by the platform function.

b. In-class activities: this part focuses on the training of problem-finding and problem-solving skills. These activities are designed to facilitate students' higher-order thinks skills. Students were divided into several small groups (typically 5 members in one group). In these smaller groups, they were assigned critical tasks extracted from the real corporate operation. In group collaborations, problem-finding, interactions, exchange of understanding and information, and problem-solving skills are encouraged.

Formative evaluation of summative evaluation

Critical thinking and creativity are formed during the process of learning and training. Therefore, the evaluation methods of the SPOC teaching mode should be diverse, in this respect, both formative and summative evaluation was applied in this mode. Specifically, on-line learning time, the accuracy of responses to the tests, active engagements in discussions were all taken into considerations. Secondly, after the completion of the course, a written exam was organized as a summative evaluation. However, unlike the traditional evaluation approach, the written exam merely takes a small part of the comprehensive score (30%).

Students' attitudes toward the SPOC Teaching Mode

When the course was finished, we designed a survey questionnaire by referring to AI-Zahrani' (2015) to investigate students' attitudes, in addition, necessary revisions were made to ensure that the questionnaire highly fit into our research objective. The reliability of the scale was examined using Cronbach's alpha coefficient. Table1 shows the results, the statistics indicate acceptable levels of internal consistency.

Subscale	No.of Items	Cronbach's Alpha
1 General views toward the SPOC Teaching Mode	11	0.969
2 The role of the SPOC Teaching Mode in the cultivation of creativity	9	0.988
3 Difficulties you faced in the SPOC Teaching Mode	7	0.959
Total	27	0.960

Table 1: Reliability statistics (n=30)

SPSS software was used to analyze the views of students toward the SPOC Teaching mode. The students' general views of the STM (the SPOC Teaching model) are illustrated in Table 2. The average score is 3.86 (the possible highest score for each question is 5). The highest score was given to item 8, and the lowest score was given to item 6, the scores of the rest items rank from 3.77 to 3.97, which show that students are upper-middle satisfied with the SPOC teaching mode.

When turning to the role of the STM in the cultivation of creativity, the mean scores of all items are shown in Table 3. The scores of sub-items are close, ranging from 3.80 to 3.9. The highest score was given to item 5, and the lowest one was found in the 4 and item 8.

We also found that students faced with difficulties with the SPOC teaching mode(M=3.16). For example, students need to spend more time on learning compared to the traditional lectures (M=3.33), in addition, it is reported that students were not prepared well to integrate on-line learning resources with classroom activities(M=3.33). The remaining items falls in the moderate range.

Items	M	SD
1 STM offers me the opportunity to review the teaching videos many times	3.97	0.89
2 STM helps me access to various learning resources	3.90	0.85
3 STM enriches my learning experience	3.90	0.85
4 STM helps me connect theoretical knowledge with practical activities	3.80	0.93
5 STM helps me collaborate with classmates and instructors	3.77	0.94
6 STM helps me establish more communications with teachers	3.63	0.89
7 STM helps me effectively participate in the learning activities	3.83	0.83
8 STM gives me the opportunity to arrange my own learning activities	4.07	0.83
9 STM helps me develop my problem-solving skills	3.90	0.85
10 Comparing to traditional teaching method, I prefer STM	3.77	0.94
11 STM promotes my personalized learning	3.93	0.87

Table 2: General views toward the STM （SPOC Teaching Mode)

Items	M	SD
1 STM helps me think differently	3.83	0.83
2 STM helps me generate more novelty ideas	3.83	0.83
3 STM helps me generate more ideas	3.87	0.86
4 STM helps me generate flexible and practical ideas	3.80	0.76
5 STM gives me the opportunity to discuss and evaluate new ideas	3.90	0.85
6 STM helps me think creatively about the causes and effects of problems	3.87	0.82
7 STM improves my ability to analyze information to generate new ideas	3.87	0.73
8 STM helps me analyze the problem's components and address them independently	3.80	0.85
9 STM helps me think creatively about how to solve problems	3.83	0.87

Table 3: The role of the STM in the cultivation of creativity

Items	M	SD
1. I was not prepared well to integrate on-line learning resources with classroom activities	3.33	0.92
2 STM required more work than traditional lectures	3.33	1.03
3 Online videos lectures and classroom activities were not prepared well	3.17	1.02
4 The teaching objective was not clear enough for me	3.13	0.97
5 I did not receive adequate feedback in classroom activities	3.10	1.00
6 I did not have adequate time to finish viewing the teaching videos and other assignments	3.27	0.98
7. It was difficult for me to use online learning tools	2.80	1.22

Table 4: Difficulties you faced in the STM

Discussion

Judging from the statistics of the survey questionnaire, generally, we found that students were satisfied with this mode (M=3.86). Furthermore, they reported that the STM can enhance their creative thinking (M=3.84). These results are consistent with prior research (Butt, 2014; Davies et al, 2013, etc.). This mode provides a suitable environment for thinking differently, generating new ideas, discussion, and analysis of information, thus, learners' creativity is effectively facilitated.

However, we also found participants faced with difficulties when attending the STM (M=3.16). For instance, students needed to spend more time on learning compared to other courses, thus, learners reported they did not have enough time. Secondly, students claimed that they did not get adequate feedback from classroom activities(M=3.1). Thirdly, online video lectures and classroom activities were not well prepared(M=3.17). These problems were also found by other studies in the flipped classroom (Strayer, 2012, etc.). Therefore, the learning load ought to be taken into consideration when a course is designed. Additionally, high quality and timely materials, effective classroom activities should be encouraged, too. Moreover, the feedback from instructors and group members should be strengthened.

Limitations and further research

The study was conducted under a certain context, higher education in China. Additionally, it concentrates on a specific course, namely, principles of accounting. Therefore, further research may focus on other courses. The teaching content and teaching objectives may have impact on the effectiveness of creativity education.

Conclusions

The SPOC teaching mode emphasizes on promoting students' self-learning and active engagements, it provides students with abundant learning resources, and appropriate classroom activities, which successfully construct a suitable environment for autonomous learning, interactions, and collaborations. Thus, it has a positive impact on students' creativity and professional knowledge.

Regarding the role of instructors, they are no longer the exporters of knowledge, they have become supporters of students' autonomous learning. Therefore, instructors' tasks have changed a lot, specifically, investigations of pre-class, the preparations of learning resources, instructions in classroom activities have become essential skills for instructors to successfully organize a course. That means not only students need to change themselves to get with this new teaching mode, but also instructors ought to undergo this change.

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