The application of a flipped classroom model in modern educational technology

Mei Liu

Department of Educational Technology,
School of Education,
Linyi University,
Middle of Shuangling Road,
Linyi 276000, China
Email: liumeilinyi@163.com

Abstract: This study constructs a flipped classroom model based on modern educational technology, in which 90 students majored in Chinese language and literature in University were chosen to participate in the study. The effects are evaluated based on a questionnaire survey. Conclusions are: The flipped classroom model is feasible and effective, and it can effectively improve students’ learning interest, self-directed learning competence, collaborative learning competence and practical capacity. Moodle can provide a good platform for flipped classroom. Not all instructional contents are fit to be flipped, so we should choose the suitable contents for flipping.

Keywords: flipped classroom model; micro-video; Moodle platform.


Biographical note: Mei Liu is an Associate Professor in School of Education, Linyi University. His areas of research interests include computer-assisted learning, blended learning, and flipped classroom.

1 Introduction

In the 21st century, informational technology has immerged into all aspects of life, and great changes have taken place in people’s lives and studies. Global education, creative education, individual learning and lifelong learning have been important features of information era. How to change the traditional model with the assistance of informational technology and improve the quality has led to high attention of the Chinese government. It was clearly pointed out in National Medium and Long-term Educational Reform and Development Program (2010–2020) issued by the State Council in 2010 that informational technology had a revolutionary effect on education, which should be paid more attention. Subsequently, it was put forward in Decade Development Plan of Educational Informatization (2011–2020) issued by the Ministry of Education of China that we should develop the learning competence of students in informational environments, encourage
them to use ICT to learn actively, autonomously and cooperatively, enhance students’ ability to find, analyse and solve problems in the network environment.

With the rapid development of educational informationisation, each teacher should master a certain educational technology competence. In China, modern educational technology (MET) has become a compulsory course to normal students in colleges and universities. However, some teachers in China are still taking the model of ‘teacher-speaking while student-listening’, ‘teacher-demonstrating while student-practicing’. But the model cannot arouse students’ interest in learning and the learning effect is low. The phenomenon is broken by the emergence of flipped classroom, in which students can take pre-class self-directed learning with the assistance of micro-video and take face-to-face interaction in class.

The implementation of flipped classroom depends on informational technology. Nowadays, there are more and more online learning platforms which can be used, such as TopClass, Blackboard, Moodle, WebCT, LearningSpace, and E-learning. With comparison, we choose Moodle Platform. Moodle is a web-based learning content management system designed around pedagogical principles, namely a social constructivist philosophy using the collaborative possibilities of the internet. Due to its flexibility, it can also be used in more outcome-oriented classroom environments. Moodle has many features expected from an e-learning platform including forums, content management (resources), quizzes with different kinds of questions and several activity modules. Moodle also has several contributed modules, including SCORM, WebQuest and the document management system.

The development of informational technology gives a good chance for flipped classroom in higher education. This study takes the public course MET to construct a Moodle-based flipped classroom model, then implement and evaluate its effects, so as to effectively improve students’ interest in learning, self-directed learning competence, collaborative learning competence and practical capacity.

2 Literature review

Baker (2000) had a vision of using electronic means to cover rote material outside of class. He realised during a college lecture that his students were capable of retrieving the notes and slide presentations themselves and encouraged them to do so. In class, rather than lecturing, Baker allowed his students to work together on applications of the principles from the content under his guidance and direction. Students had a positive perception toward the flipped classroom, indicating learning was more personalised, and cooperative learning groups fostered critical thinking, and online resources provided students more control over their learning. Similar to Baker (2000), Lage, Platt and Treglia (2000) flipped their college economics courses and found parallel results. Students believed it was easier to ask questions during class, enjoyed learning from their peers, and found the video lectures online to be quite valuable. The flipped classroom approach involves engaging students in knowledge acquisition of course material prior to a class session, typically through assigned readings or lecture videos, leaving class time for the integration of knowledge through application, analysis or synthesis-based activities (Bergmann and Sams, 2012). In essence, students are introduced to course concepts prior
Application of a flipped classroom model

Application of a flipped classroom model to class sessions, allowing in-class time to offer students opportunities to work with the concepts while utilising the support of peers and the instructor. As such, in-class learning is shifted from traditional lecture delivery to class activities such as concept checks, discussions, debates and activities involving application, analysis, problem-solving, experiments and/or evaluation (Johnson and Renner, 2012).

There is a considerable amount of research in support of the flipped classroom. Several studies documented an increase in students’ academic performance within the flipped classroom. Davies, Dean and Ball (2013) compared a traditional introductory spreadsheet skills course with a flipped model and found the flipped model of instruction to be more effective. Flumerfelt and Green (2013) showed impressive learning achievement, behavioural improvement and increased interaction between teachers and students in a flipped classroom. There are two key advantages to a flipped approach. The first is that students have the flexibility to move at their own speed as they work through out-of-class elements, perhaps focusing on different videos or materials as appropriate to their levels and interests. This promotes student autonomy, and differentiation and personalisation of learning (Bergmann and Sams, 2012; Davies, Dean and Ball, 2013). It may be of particular benefit to students with special needs or linguistic, social and other disadvantages (Bergmann and Sams, 2012). Moreover, data generated on student actions and accomplishments may eventually feed into learning analytics (Enfield, 2013; Thompson, 2011). The second advantage is that, with the more pedagogically traditional elements of education occurring outside the classroom, and students arriving in class primed for learning (Sams, 2013), in-class time is freed up for discussion, interaction, collaborative inquiry and hands-on activities (EDUCAUSE, 2012).

A number of studies across a range of disciplines at tertiary institutions have shown promising results with the use of a flipped approach. In some cases, it has been found to produce improved learning outcomes (Missildine et al., 2013), and in many cases it has led to greater student satisfaction (McGivney-Burelle and Xue, 2013; Pierce, 2013). It has been suggested that students’ increased ownership of self-paced work, including note-taking from videos and responding to questions, can contribute to learning outside class (Davies, Dean and Ball 2013; Enfield, 2013). However, some caution is necessary. Strayer (2012) found that students struggled to connect online and face-to-face course components and to orient themselves to classroom tasks, while Missildine et al. (2013) found that students were more satisfied with traditional lecture and lecture capture approaches, reporting that the flipped approach required more work, and failing to appreciate the value of interactive learning.

Many tertiary institutions in China are also taking practical research of flipped classroom these years. Zeng (2012) provides a flipped classroom model and points out three key procedures: pre-video-watching learning - discussing and offering questions, video-watching learning - finding answers to the questions, question-solving leaning - deeper perceiving questions. Based on Talbert’s model, Zhang et al. (2012) constructs a flipped classroom model, in which pre-class learning and in-class learning are included; IT and activity learning are two important supports to the constructing of the learning environment. However, the two models only provide basic procedures and frameworks of flipped classroom, but not connect with practical teaching contents. In practice, model of ‘teachers becoming coaches’ in Changzhou foreign languages school, model of Nanjing
Xingzhi Experimental School cooperated with Lujiang Web School, and ‘3456’ model of Chongqing Jukui Middle School are all innovating flipped classroom models and achieve good effects.

The research of flipped classroom in China is still on the process of beginning and most occurred in primary and middle schools, but few can be found in tertiary institutions, and fewer in MET. More attention is paid to informationisation in China today, MET has become a compulsory course to normal students in colleges and universities. Taking Moodle platform as the technological support, this research is of great importance to construct and implement flipped classroom model, which is flexible to MET.

The purposes of this study are as follows:
1. to construct a flipped classroom model based on the course of *Modern Education Technology*
2. to implement the model and verify its effects.

3 Methodology

3.1 Context

The teaching objective of MET in Linyi University is to cultivate the integration competence of information technology and the course, and to improve the teaching quality with the help of IT in the future. The course lasts for 8 weeks with 4 class hours per week. Its teaching environment is multi-media internet classroom and technology platform is Moodle.

After analysing the teaching contents of the course, three topics are chosen to flipped, but other contents are not take the flipped classroom model, due to the worry of after-class learning burden to students. The following are the three topics.
1. the emergence and development of MET (first week)
2. the theoretical foundations of MET (second week)
3. designation and making of micro-course (sixth to seventh week).

3.2 To construct the model

Students in higher education have had certain informational technology capabilities. They can study autonomously and collaboratively online. Based on constructivism, mastery learning theory and instructional design, and referring to successful experiences, we construct a flipped classroom model-based Moodle platform, as shown in Figure 1.
3.2.1 Pre-class self-learning stage

3.2.1.1 Teacher’s activity

1. To determine instructional objectives

When we talk about the flipped classroom, our first reaction is to make instructional videos. But we must determine instructional objectives first. Determining the objectives can help us assure what we need students to know and master. And this is the first thing to be made clear. Only clearly know instructional objectives can we determine what is fit for flipped classroom and what are not.

2. To provide learning resources

In flipped classroom, teachers need to provide rich learning resources, including PPT, micro-video, text materials. Learning resources can not only made by teachers, but also download from internet. Making of micro-videos is the vital part of flipped classroom. The length of a video is about 5–10 minutes. It is made according to knowledge points. Before making micro-videos, analysing the learners and assuring how to present instructional contents should be considered. There are many ways to present the contents. The first way is to record the classroom, which means to record teacher’s instruction in micro-teaching classroom or with camera. The second way is to use Camtasia studio to capture PPT with the head portrait of the teacher. The third is only the content recorded without the teacher in the video. For example, in the video of Khan Academy, there is only a hand with an interactive whiteboard in which there is the outline of instructional contents. A quiet place is needed when recording the instructional video in order to reduce the interruption of noises when the learners are watching the video.

Before class, the teacher should provide learners with learning task list to help them better self-learning. In the task list, there are many items such as learning subject, the goals to be achieved, suggestion about learning methods, learning
resources, learning tasks and difficulties, etc. In addition, the teacher should design micro-exercises in order that students can test their learning outcomes.

3.2.1.2 Learners’ activities

1 To watch micro videos

Before class, students watch videos with their own speed and grasp basic knowledge. They can pause anywhere according to their own pace. When they are watching videos, they can take notes in encountering difficulty and take them to classroom, or they can ask for help from teachers or other classmates online. The students should summarise the knowledge and make it clear what they have mastered and what they cannot understand.

2 To do micro exercises

After finishing watching videos, students should do some exercises, which the teacher has arranged. These exercises aim to strengthen their knowledge and find out their difficulties. The teacher should make a reasonable design about the quantity and difficulty of pre-class exercises, and assure that it can reflect what questions the students have. Students can communicate with the teacher or peers in Moodle platform. The results of the test can directly feedback to the teacher.

3.2.2 Classroom activity stage

3.2.2.1 To arrange activities

Theory and technology are equally stressed in MET. To help students learn from ‘do’, we design a series of activities to integrate theory with technology. The completeness of these activities is based on theory and supported with technology. Thus students can grasp the application better. The contents of these activities have close connection with curricula in primary and middle school. In arranging these activities, the teacher needs to remind students to finish these activities by using the theory and technology they have grasped in pre-class self-learning stage. Simultaneously, it can greatly improve the deeper understanding of the theory and technology.

3.2.2.2 To finish activity independently or collaboratively

The teacher can allow students to choose to finish an activity independently or cooperatively according to its difficulty. The flipped classroom provides students personalised learning environment and they can finish individually the easier assignments. Whenever they encounter difficulty, they can find help from the internet, classmates and teachers. If there are difficult task, learners can finish it with team work. The learners are divided into groups, and each group has three to four learners. The members in a group should exchange their understanding of knowledge with others in group, and finish learning tasks.
3.2.2.3 The teachers’ guidance

No matter self-learning or collaborative learning, the teachers are not standing on the teachers’ podium, but walk out of the podium and observe learners carefully to provide timely assistance. If there are common problems, teachers will explain these problems in the classroom publically. If not, providing individual guidance.

3.2.2.4 To show achievement and share comments

After independent inquiry and discussion in group, learners finish the individual and group achievements. They can communicate through the seminar, exhibition, debate or mini competition. During the display of outcomes, learners can get a deeper comprehension through other evaluation. Meanwhile, learners can learn the merits of others, and know the advantages and disadvantages of their own through watching the works of others. The learners can constantly get the pleasure from learning, and face the later life with more optimistic attitude. During the exhibition of achievements, the teacher not only encourages learners to present in class, but also encourages them to upload their works to Moodle to be discussed by the teacher and other classmates.

3.3 To implement the model

3.3.1 Participants

In the second semester of 2014–2015, we chose 90 students in Class 1 and 2, Grade 2012, in Chinese Language and Literature Department as an experimental class. We chose another 90 students in Class 3 and 4 as a control class. Learning situation is basically the same in the two classes, no significant difference in academic achievement and learning atmosphere. They had the same number of students, and equal proportion of boys and girls, and had the same teacher. As deigned before, we chose the following three topics to flip:

1. the emergence and development of MET (first week)
2. the theoretical foundations of MET (second week)
3. Design and development of micro-courses (sixth to seventh week). It used process assessment. Each student should upload his/her works. The teacher gave the final academic performance according to the mean value of all the works.

3.3.2 Procedure

Now, we choose the topic of ‘the design and making of micro-course’ to explain the process of teaching.

3.3.2.1 Pre-class self-learning stage

1. Teacher’s activities
a To determine instructional objectives

With the learning of ‘the design and making of micro-course’, learners can learn
the concepts of micro-course and flipped classroom and grasp the technology in
designing and making of micro-course and make a 5–7 minutes’ micro-course in
group.

b To make micro-videos

The teacher recorded the topic ‘design and make micro-course’ into eight micro-
videos. The micro-videos adopted the type of ‘recording the screen’ with
Camtasia studio 8, with the voice of the teacher, without the head portrait of the
teacher, as Figure 2 shows.

Figure 2 The preface of micro-video (see online version for colours)

Figure 3 Screenshot of Moodle platform (see online version for colours)

c To design self-learning task list, upload learning resources

Besides the videos, the teacher designed self-learning task lists and micro
exercises to help students better self-learning, looked up part of classical cases.
Then the teacher uploaded all learning resources to the Moodle platform,
including self-learning task list, PPT, micro-videos, micro exercises and
classical cases, as shown in Figure 3.
Application of a flipped classroom model

2 Learners’ activities stage

a Problem identification and trouble shooting

Before class, the teacher found that many learners cannot distinguish some concepts, like micro-course, flipped classroom, and MOOCs. So the teacher made a concentrated explanation to all learners.

b Task assignment and autonomous inquiry

In order to help learners better understand the concept of flipped classroom, the teacher assigns the task in the forum of Moodle, including “After searching materials, tell us your opinion about flipped classroom. Do you think flipped classroom will replace the traditional classroom?” The learners looked up Baidu, CNKI and other resources, and replied as shown in Figure 4.

Figure 4 Screenshot of Moodle platform (see online version for colours)

You对翻转课堂在语文课中的应用的看法？你认为翻转课堂会取代传统课堂吗？
by 朱手泽 201202010016 - Tuesday, 7 April 2015, 4:57 PM

代翻转课堂？

翻转课堂亦称反转课堂，是在近几年新兴起的一种与传统课堂授课教学模式相弥补的教学形式。

在“信息传递”阶段，学生通过自学能够对知识进行初步了解，与此同时教师也可以根据学生的需求，对学习者不理解的问题进行解释和说明，从而在课堂正式授课环节明确学生通过自学掌握知识的情况，对大家难以理解的知识点进行重点的讲解。实现课堂有质的转变，有益于学生对知识点的消化和理解。

在“问题内化”阶段，也是学生在翻转课堂学习之后的练习与应用。根据问题理解知识进行复习，为了加深学生对知识点的理解和巩固。在思考问题的过程中，如果发现无法解决的问题，可以提出翻转课堂的讨论区来向教师提出问题，教师在解答的同时也能够及时了解学生对本节知识点的掌握情况。

代翻转课堂特点。

利用翻转课堂实施教学，近半年的翻转课堂实施过程，使得翻转课堂教学和学习方法受到学生的欢迎。所以学习者对于翻转课堂的接受度如何呢？这有翻转课堂有几个特点。

第一，教学视频短小精悍。
第二，教学内容清晰明了。
第三，重新构建学习过程。
第四，复习检测及时快捷。

我认为是不可以替代传统课堂。

c Collaboration in group

In order to help learners really master the techniques of making micro-courses, the teacher assigned a task. The learners were required to choose a knowledge point in primary and secondary Chinese textbooks, and make a 5–7 minutes’ micro-course in groups. The teacher would offer guide if necessary. The learners’ collaborative and creative competences would be promoted through the group activity.

d Performance exhibition and sharing

Every group should upload their works to Moodle platform and exhibit in class. The teacher and other group members should evaluate the works. Through evaluation, students could share the experiences and avoid the deficiencies.
3.4 Research questions and the instrument

At the end of the eighth week course, we made a questionnaire survey to all students in experimental class and control class. Then the effects of teaching practice will be analysed from the following aspects. The questionnaire was modified based on the questionnaire on instructional effects of flipped classroom model (Cheng, 2014). It included nine single choices and an open topic. The nine single choices are the investigation on the attitude to the model, the pre-class learning burden, pre-class learning resources, in-class discussion, Moodle platform, learning interests and learning competence. The open topic is to master the students’ opinions and suggestions about the model. The respondents were 90 students in experimental class. A total of 90 questionnaires were issued and received. The surveying data were summed up by frequency, and classified with tables. In order to compare with the experimental group, the control group of 90 students participated in the study answered the four questions of learning interest, self-directed learning competence, collaborative learning competence and practical capacity.

4 Results

4.1 Survey on the effect of the model’s implementation

4.1.1 Attitude to the model

The learners’ attitude to the model is shown in Table 1. The table shows that 35.7% students like the model very much, 39.3% students like the model, 13% students choose neutral, whereas the rest 12% students choose dislike and dislike very much options.

Table 1  Attitude to flipped classroom model

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Like very much</th>
<th>Like</th>
<th>Neutral</th>
<th>Dislike</th>
<th>Dislike very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratio</td>
<td>35.7%</td>
<td>39.3%</td>
<td>13.0%</td>
<td>9.6%</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

4.1.2 Opinions on pre-class learning burden

The students’ opinions on the pre-class learning burden are shown in Table 2. Results show that 26% students think that they have heavy burden, but most of the students can accept the learning tasks. 19.9% of our respondents reported they feel relax, and only 5% endorsed the very relax option.

Table 2  Opinions on pre-class learning burden

<table>
<thead>
<tr>
<th>Opinions on pre-class learning burden</th>
<th>Very heavy</th>
<th>Heavy</th>
<th>Appropriate</th>
<th>Relax</th>
<th>Very relax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratio</td>
<td>12.7%</td>
<td>13.3%</td>
<td>49.1%</td>
<td>19.9%</td>
<td>5%</td>
</tr>
</tbody>
</table>
4.1.3 Opinions on learning resources provided before class

As shown in Table 3, learning resources (micro-video, PPT, self-learning task list and classical cases) provided by the teacher will benefit the learners’ learning effects. Students are especially fond of the micro-video self-learning materials.

Table 3 Opinions on learning resources provided before class

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Very helpful</th>
<th>Helpful</th>
<th>Neutral</th>
<th>Helpless</th>
<th>Very helpless</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratio</td>
<td>34%</td>
<td>37.9%</td>
<td>15.1%</td>
<td>10.3%</td>
<td>2.7%</td>
</tr>
</tbody>
</table>

4.1.4 Opinions on the discussion activity

As shown in Table 4, 67.9% students think that discussion is helpful for learning, which means that most students can adapt to discussion. 15.1% students choose the neutral option, 10.3% of our participants believe that the discussion activity is helpless, and 6.7% regard it very helpless.

Table 4 Opinions on the discussion activity

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Very helpful</th>
<th>Helpful</th>
<th>Neutral</th>
<th>Helpless</th>
<th>Very helpless</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratio</td>
<td>30%</td>
<td>37.9%</td>
<td>15.1%</td>
<td>10.3%</td>
<td>6.7%</td>
</tr>
</tbody>
</table>

4.1.5 Opinion on Moodle platform

As shown in Table 5, 68% students can easily operate in Moodle. Only 9.7% students think that it is not very easy to operate. None of the students believe that it is very difficult. This reveals that Moodle is suitable for flipped classroom.

Table 5 Opinion on Moodle platform

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Very easy</th>
<th>Easy</th>
<th>Neutral</th>
<th>Difficult</th>
<th>Very difficult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratio</td>
<td>25.5%</td>
<td>42.5%</td>
<td>23.3%</td>
<td>9.7%</td>
<td>0</td>
</tr>
</tbody>
</table>

4.2 Comparison about learning interest between the experimental and control class

As shown in Figure 5, 74% students in the experimental class are interested in the course, while only 40% in the control class. This reveals that the students in the experimental class are more interested in MET than that in the control class. Meanwhile, students with low interest are fewer in the experimental class than that in the control class. So we can conclude that flipped classroom can help to improve students’ learning interest.
4.3 Statistics of learning competence, practical capacity in two classes

As shown in Figure 6, 84.8% students in experimental class think that their self-learning competence has been proved, while the equivalent number of control class is 55.6%. The experimental group has 65.2% of the students think that their collaboration has improved a lot or greatly, 14.9% higher than the control group (Figures 7 and 8). As shown in Figure 8, 82% students in experimental class think that their practice capacity has improved, while the equivalent number of control class is only 64%. The obvious difference reveals that flipped classroom based on Moodle can improve the students’ competence in analysing and solving problems. It also plays an important role in improving the students’ autonomous and collaborative learning competence.

Figure 5  Students learning interests (see online version for colours)

<table>
<thead>
<tr>
<th></th>
<th>very interested</th>
<th>interested</th>
<th>neutral</th>
<th>uninterested</th>
<th>very uninterested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>37.1%</td>
<td>36.9%</td>
<td>12.0%</td>
<td>10.4%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Control</td>
<td>18.2%</td>
<td>21.8%</td>
<td>35.0%</td>
<td>11.0%</td>
<td>15.4%</td>
</tr>
</tbody>
</table>

Figure 6  Statistics on self-learning competence (see online version for colours)

<table>
<thead>
<tr>
<th></th>
<th>proved</th>
<th>greatly proved</th>
<th>a lot</th>
<th>proved a little</th>
<th>not proved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>31.2%</td>
<td>33.3%</td>
<td>18.2%</td>
<td>9.2%</td>
<td>6.1%</td>
</tr>
<tr>
<td>Control</td>
<td>19.9%</td>
<td>20.1%</td>
<td>15.6%</td>
<td>24.3%</td>
<td>20.3%</td>
</tr>
</tbody>
</table>

Figure 7  Statistics on collaborative competence (see online version for colours)

<table>
<thead>
<tr>
<th></th>
<th>proved</th>
<th>greatly proved</th>
<th>a lot</th>
<th>proved a little</th>
<th>not proved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>36.7%</td>
<td>34.0%</td>
<td>10.1%</td>
<td>16.9%</td>
<td>5.9%</td>
</tr>
<tr>
<td>Control</td>
<td>38.1%</td>
<td>24.3%</td>
<td>10.7%</td>
<td>13.8%</td>
<td>12.5%</td>
</tr>
</tbody>
</table>
4.4 Comparison of scores between experimental and control class

As shown in Table 6, the average score in the experimental class (short for EC) is 85, while it is 80 in control class (short for CC). In total, the score in the experimental class is better than that in the control class.

<table>
<thead>
<tr>
<th>Class</th>
<th>Number</th>
<th>Average</th>
<th>100–90</th>
<th>89–80</th>
<th>79–70</th>
<th>69–60</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC</td>
<td>90</td>
<td>85</td>
<td>16</td>
<td>35</td>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td>CC</td>
<td>90</td>
<td>80</td>
<td>10</td>
<td>29</td>
<td>25</td>
<td>26</td>
</tr>
</tbody>
</table>

4.5 Opinions on using Moodle-based flipped classroom in MET

In the open topic ‘What’s your opinion on using Moodle-based flipped classroom in MET? What are difficulties? How to improve it?’, 75% students regard that this model is so good that they will adopt this model when they become teachers. Many students say when they encounter problems they can communicate with the teacher, classmates timely in flipped classroom. A considerable part of the students believe that if the whole course adopts the flipped classroom model, it would increase their learning burden. Minority of students think they are not used to this model. Some students suggest that the micro-videos before class should be more interesting, and the teacher should design more attractive classroom activities.

5 Conclusion and discussion

This study chose the students in Grade 2012 in Chinese language and literature as samples. Based on the public course MET, the author constructs a flipped classroom model. After 8 weeks’ (including 4 weeks’ flipped classroom) course teaching, the effects are verified by examination and questionnaire survey. The conclusions are as follows:

1. The flipped classroom model based on MET is feasible and effective. The survey shows that most students like the flipped classroom model. The students autonomously study with micro-videos at their own pace before class. In class, they can apply and internalise the knowledge by discussion and collaboration.
Flipped classroom can stimulate the students’ learning interest, and improve their independent, collaborative and creative learning competence. Learners can choose their favourite time or place to have self-learning with the help of learning resources before class. In class, they can actively finish practical activities based on theory and with the help of technology. They are learning from doing now, but not like the ‘teacher speaking and students listening’ model in the past. Therefore, the students’ interest in learning, self-learning competence, collaborative competence and practical competence are all improved effectively.

The flipped classroom model can improve the students’ performance. In the flipped classroom, the delivery of knowledge is put before class, and the higher order thinking activities are trained in class. The students finish their deep construction by application, analysis, synthesis, creation, which can improve their performance.

Moodle can provide the flipped classroom with a good platform. Moodle is a free and open source learning platform, with many functions and easy to operate. It can satisfy the needs of flipped classroom and provide it with tech-support.

Not all of instructional contents are suitable to be flipped. If all the contents are taught in flipped classroom, more learning burden will be brought to students.

The model is designed based on the course of MET, but whether the model is fit for all subjects should be further studied and tested. This study chose only part of students in Chinese language and literature as the subject of study. The number of subjects is small, so the results should be further tested before generalisation. The flipped classroom model had only 4-week experiment, and the length of the experiment is not long enough, so the scientificity and integrity should be further perfected.

Based on the study, we will research more on the following questions: Making micro-videos is the most important part of flipped classroom. How to make high-quality micro-videos according to learners’ audiovisual psychology to better attract the students autonomous learning? Which platform will be used or developed to implement flipped classroom better, QQ or WeChat? How to design and organise a class to fit the learners’ learning needs? Anyway, flipped classroom is a developing trend in future teaching. More and more scholars and teachers will join in the research to it, and the related theory and practice will be richer.

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References

Application of a flipped classroom model


