Content Analysis of Pre-service Teacher's Handbooks with Online Early Field Experience Course

Saiqi Tian[1,*], Jinxing Zhu[1], Sheng Ding[1]

[1]College of Education, Wenzhou University
[*]Corresponding author. Email: tiansaiqi@wzu.edu.cn

ABSTRACT

We designed and implemented an online early field experience (EFE) course for pre-service teachers, in order to construct their teaching knowledge and attitude. The content of pre-service teachers' handbooks in EFE course was analyzed via the Natural Language Processing & Information Platform (NLPIR). Overall, results show the online EEF course was highly evaluated and favorably accepted by the per-service teachers, which is considered a favorable outcome. It is promising that such online course will have a synergistic effect on outline course in the future.

Keywords: Early field experience; Course; Content analysis; Pre-service teacher; handbooks

1. INTRODUCTION

Well-prepared teachers are of great importance in implementing a successful inclusive education. Teacher educator must provide pre-service teachers with positive altitude and enough skill for sustainable development. As is well-known, an excellent teacher with professional skill cannot be developed only by theoretical knowledge study. [1, 2] Pre-service teachers are supposed to put the theory into practice for the future teaching career. Field experience plays a significant role in building their learning system and attitude to occupation.[3-5] Usually, early field experiences (EFE) are prior to final teaching practicum or internship, whose duration are shorter.[6] During this process, future teachers enter real schools, work with students and teachers in real classrooms. They have the opportunity to observe and cooperate with experienced teachers as well as get along with students, thus to construct their teaching knowledge, skill and attitude.

Unfortunately, an unexpected epidemic caused by Coronavirus disease (COVID-19) broke out in China since the early spring of 2020, and then spread globally. Due to the infectivity of COVID-19, the original in-class face-to-face approach to EFE for teacher candidates is disrupted. We proposed to start online EFE course through internet. Traditionally, there is only one tutor for each pre-service teacher in one school. Whereas, normal undergraduates are able to be guided by various teachers from different schools online, so that they can receive diversiform educational attitudes and thoughts. With the development of internet, it is totally predictable that online education will soon be a tendency.[7, 8]

Thereby, it is essential to study whether these online EFE course can complete the education tasks with high quality and whether it can be an effective learning approach for pre-service teachers. In this article, we collected a number of pre-service teacher's handbooks during their EFE course, and carried out content analysis with these texts. The purpose of this study is to understand the efficiency and current situation of online EFE course.

2. METHODS

2.1. Overview of online EFE course

This EFE course lasted 10 days and was organized with four parts, which are listed in Figure 1. (1) Class recording: experienced teacher's class was video recorded and then played through live-broadcasting platform. There are three subjects, Chinese, mathematics and science.(2) Educational interview: pre-service teachers gained opportunity to interview experienced teachers through internet. They were supposed to design concerned question about education before interview, thenceforth did video interviews online. (3) Lecture: 14 preeminent teachers from diverse schools were invited to give a speech to these participant students. The themes of those lecture are about their teaching experience. (4) Daily group discussion: after the class recording or lectures, per-service teacher are required to have a group

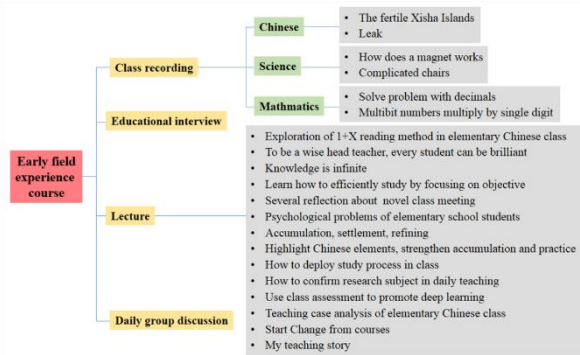discussion to share what they learnt and what they thought every day.

Figure 1 Constitute of EFE course.

2.2. Participants and data collection

162 participants who major in primary education took this EFE course. All of them are the first grade undergraduates. After the course was implemented although prior to analysis, informed consent was acquired from participating students. All participates were requested to hand in a handbooks after the end of the course. The handbooks are composed with five parts: EFE diary, educational interview, class notes, lecture notes and summary. Among the 162 participates, the results from 114, who submitted the handbooks, were utilized for the purposes of this study. All handbooks were handwritten, and then converted to anonymous electronic data for later analysis. The texts of EFE dairy, educational interview, summary were collected with totally 422,897 Chinese characters.

2.3. Analytical methods

A text-mining method was used for content analysis, and this involved using automated procedures to extract high-frequency words and phrases. [9-11] In this study, the software NLPIR (Natural Language Processing to Information Retrieval) was employed for analysis, which is specialized for mining frequently used words. [12] Every word was weighted and ranked, not only by how many times the word used, but also the part-of-speech of a certain word, the location of the word in sentence, whether the word is frequently used on internet. All the data were originally in Chinese and analyzed as Chinese words. After the research was completed, all the words were translated into English by the authors for the purposes of this report. Function words which lack meaning were deleted from the results.

3. FINDINGS

3.1. Overview of pre-service teacher's handbooks for EFE course

Word cloud of Top 20 high-frequency words

extracted from handbooks was presented in Figure 2. "Student" is at the top of the list according to both weight and frequency, which is higher than "Teacher", indicating that per-service teachers concern more about students. "Teacher" is the second frequently mentioned word, which related to the future occupation of participants. "Teach" and "Study" rank the third and fourth, respectively, demonstrating teacher candidates pay a lot of attention to them. "Early field experience", "Lecture", "Class recording" are the theme and constitute of the course, thereby appearing frequently. "Kid" is the future educational object for these participates who major in primary education, and the word is repeatedly referred to in the handbook. Pupils and undergraduates specialized in primary education are emphasized to possess reading literacy in China, especially for future Chinese teacher. [13, 14] Accordingly, "Read" ranks higher in the list. "Class meeting" and "Head teacher" are also concerned. Head teacher is the one who is in charge of a class in Chinese primary school.[15] It is worthy to note that the frequency of "Miss Zhang" and "1+X" is relatively low, nevertheless, the weight is high. Miss Zhang is a well-known teacher in a primary school, and she gave a lecture titled "Exploration of 1+X reading method in primary Chinese class" to participants, which strongly impressed them. Particularly, the frequency of "Parent-child reading" in merely 60, but it carries much weight, which implies it is of great importance. "Teaching objective" is followed with interest by future teachers as expected.

Figure 2 Word cloud of Top 20 high-frequency words extracted from handbooks.

3.2 Content analysis and sentiment analysis of EFE diary

Pre-service teachers wrote diary during the EFE course every day, and 239,839 Chinese characters were collected. "Read", "Parent-child reading" are listed forward based on frequency and weight, respectively. The significance of reading for pre-service and post-service primary teacher, likewise pupils are recognized through the content analysis. Moreover, it is universally accepted that parent-child reading is able to lay an important foundation for children's later language and literacy development.[16, 17] As is mentioned above, lecture about "1+X" reading method given by Miss

Zhang also recorded frequently in diary. "1" represents a text in textbook, and "X" are articles related to that text. 1+X reading method is regarded as an efficient approach to improve pupil's interest and literacy in reading. "Class meeting" ranks in the tenth, which proves that a large proportion of participants focus on how to effectively hold a class meeting. Class meeting is weekly held under the charge of head teacher, usually focusing on a theme. Every student has the right to makes their voices heard and participates in class management in class meeting.[18] However, designing and holding a high quality class meeting is dramatically huge challenges for fresh head teachers.

To further investigate the efficiency of online EFE course, sentiment of the dairy content is analyzed. Words relative to emotion are selected from the first day diary and the last day diary. Both in the first day and in the last day, "learn a lot" is the most high frequency referred. This indicate participants think they gained extensively from this online course. For the first day diary, "look forward" and "hope" ranks the second and the third, respectively. It is the first time to carry out online EFE course, all the participants look forward to the following courses and hope everything goes well. Even so, a part of pre-service teachers feel anxious and nervous about the unknown online lessons. As to the last day dairy, words associated with emotion make a difference. A majority of participants are "grateful" for this experience and feel "fulfilling". "Time flies" appears frequently, revealing that per-service teachers enjoy the education process. For all this, "anxious" is mentioned 5 times, which is a manifestation that not everyone completely adapts to online EFE course.Additionally, the positive and negative words in the first day diary and the last day diary are calculated and. The negative words reduce significantly after 10-day course.

3.3. Content analysis of educational interview

As freshmen who majors in primary education, pre-service teachers are eager for an opportunity to get in touch with real teaching environment. Since they can be give valuable advice for their academic plan by experienced teachers. Questions and topics of interviews are obtained and total 19,974 Chinese characters. The high-frequency words of educational interview reflect the most concerned topics of future teacher.

Inevitably, "student", "teacher", "teach", "work", "class", "kid", "school" are repeatedly referred to. "Parent" and "Family" rank unexpectedly high. It proves that per-service teachers generally think family education are vital for pupils. "Primary Chinese teacher" and "Primary Chinese" frequently appears. It is understood quite a few participant intend to choose Chinese as their future teaching subject. "Teaching method", "Prepare lessons" and "Textbook interpretation" are essential professional skill for teachers, so numerous questions

associated to them are raised during interviews. As described above, it is hard for a fresh head teacher to hold a class meeting of high quality. Consequently, "Class meeting" and "Head teacher" are mentioned on many occasions.

3.4. Content analysis of pre-service teacher's summary

At the end of the EFE course, all the participants wrote a summary about the 10-day online course, to record what they learnt and what they felt. Chinese characters of all the summary sum to be 163,084. "Reflect" appears repeatedly, which proves that most per-service teachers are deeply affected and start pondering about the future career. "Knowledge" and "Learn a lot" are mentioned 223 times and 133 times, respectively. Combined with sentiment analysis of EFE diary, it implies that the online EFE course have a positive effect on the construction of participants' teaching knowledge and attitude. In particular, "1+X" makes a profound impression. "Head teacher" is likewise frequently referred to.

4. DISCUSSION

From content analysis of per-service teachers' handbook, we consider that the online EEF course is highly evaluated and favorably accepted by the per-service teachers. We expect the EEF course to be different from offline classroom education, and normal undergraduate students who participated in the course are able to achieve different types of learning on internet. This was regarded as a favorable outcome since the participants obtain a good impression of this online course. The sentiment analysis of EEF diary suggest that participants gradually adjust to the online course and start to become interested in this educational approach. This emotion change is considered an important experience for participants during their university years, suggesting that the participants have achieved effective learning through the online course. It is hoped that such online course will have a synergistic effect on outline course in the future.

The aim of the EFF course is to enable teacher candidates to visualize their future working in the schools by seeing teachers doing such work. "Miss Wang" and "1+X" are common used in the content of handbooks, which reveals that a preeminent lecturer have tremendous impact on listeners. Per-service teachers should be arranged to get more in touch with experienced teachers in their academic career. Besides, "class meeting" and "head teacher" are repeatedly mentioned, which is regarded as the prime concerned topics by teacher candidates. This give us the reflection on the curriculum setting for undergraduates who major in primary

education. Courses about head teacher skills should be set more in teacher education.

While the research yielded interesting results, it is important to note some limitations of this research strategy. First, only undergraduate students major in primary education participated this online EEF course. The problem could be addressed administering the online course to pre-service teachers in diverse majors. This would lead to further understanding of the online EEF course effects. Secondly, all the results were analyzed only by discussion among analyzers, but no statistical evaluation of the inter-rater agreement was made in this study. We expect that in this way, we are able to evaluate every mined word or phrase statistically to support the results or conclusions. Third, only 114 of 162 students submitted the handbooks, so it is possible that the results are biased. Future trials need to collect data from such 48 students.

5. CONCLUSIONS

In summary, we designed and implemented an online early field experience (EFE) course for per-service teachers. This course includes class recording, educational interview, lecture and daily group discussion. Pre-service teacher's handbooks during this course were collected and analyzed through text mining. The results indicate the online EFE course have a positive effect on the construction of participants' teaching knowledge and attitude, which is deemed a favorable outcome. Thereby, it can be a promising EFE approach. Along with academic learning, it is essential to arrange teacher candidates get more in touch with experienced teachers and set courses about head teacher skill.

AUTHORS' CONTRIBUTIONS

Conceptualization, Saiqi Tian; methodology, Saiqi Tian; formal analysis, Saiqi Tian, Jinxing Zhu, Shengding; investigation, Jinxing Zhu, Shengding; data curation, Jinxing Zhu, Shengding; writing, Saiqi Tian; supervision, Saiqi Tian.

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