

# Qualitative Text Mining in Student's Service Learning Diary

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## Abstract

*Since Harvard University emphasized the important characters of college students, the service learning courses or activities is driving in educational system especially in higher education in order to building up the students global caring characters. This paper used the text mining technology to analyze the diary of the pre-service teachers attending the service learning activities. The purpose of this paper is to appear and analyze the service learning activities in order to finding out the learning outcome of students as well as providing a reflection of the service learning activities. The significance of this study is to provide a reflection and strategy form the practical data driven and using qualitative text mining technology. In other words, this study combined the Ground theory and text mining technology to find a storyline for reflection and to suggest some rare and important factors for improving the service learning activities.*

## 1. Introduction

Recently, the service learning courses or activities are the main indicator for building up the students characters of globalization and care for the disadvantaged groups in higher education. Students, who attend the service learning courses or activities, usually will participate in different events with different people. Through the experience of activities, students build up their character of caring people as well as extend their vision of globalization. Dr. Dewey emphasized that experiential learning accord because of students adding something and making contributions [1][2]. Dr. Lewin followed by the theory of Dewey and added the action research methodology to make the experiential learning as an integration of theory and practice [3]. Then, Dr. Piaget and Dr.

Bruner caused a movement in curriculum and instruction for the experience-based design into the college level courses [4][5]. Therefore, designing an experience-based instruction is not a new topic. However, it is hard to practice in the classroom especially in higher education system where the instruction design is lecture for big audience. The pre-service teacher program is in higher education for educating college students to be the secondary education teachers. Hence, the experience-based courses are important for per-service teacher program.

The service learning focuses on providing service as well as learning form the service activities [6]. However, Eyler (2000) indicated that the impact of service learning on college students needed to identify intellectual outcomes to embed into instructional design [7]. In order to assessing the outcome of service learning, Karayan and Gathercoal (2005) used a "ProfPort Webfolio System" for student service learning as teaching, learning, assessment and research tool [8]. The system somehow is part of traditional portfolio. So, how to improve the quality of service learning is back to how to investigate the reflection to making improving.

Journal writing is a popular technique for students to reflect their learning in service learning courses or activities. Bain et al. (2002) found that the journal writing was the better feedback for pre-service teachers to practice their teaching by self-analysis [9]. Therefore, this study used this technique as a tool to help students reflecting their teaching processing while they were practicing the teaching skills in servicing learning activities.

### 1.1. Purpose of the study

This study combined the qualitative research, ground theory, and the computer technology, text mining model, to find rare and important information.

Then, This study would innovate a possible better teaching methodology from the scenario. In other words, this study would like to know how what happen in the service learning activity period including the training schedule. Then, these qualitative and quantitative data would appear information. This study was emphasis not on the obvious information but on the rare and important information. This study would try to understand

- The process of the service learning activity
- The service learning activity scenario with the rare and important information
- The innovative and improving service learning activity project

Although this study applied the text mining technology, the main research method was based on the ground theory. Moreover, this research would follow the action research looping process, look -> think->act. This study would be the first cycle of the action research. The significance of this study would be to understand how the pre-service teachers practicing their training in actually a simulation situation with junior high school students in the service learning activities.

## 2. Related Literature

Since this study is an experimental research in education using computer technology. The related literature contained not only the education innovation but also computer technology. However, the main related literature would be introduced below including the instructional design, text mining, and disadvantaged remote education districts.

### 2.1. Instructional Design

Instructional design is to provide teaching blueprints, and to examine teaching and offer solutions. Accordingly, the practice of instructional design is to target specific learners, select specific approaches, contents, and strategies, and make an effective teaching policy [10]. Instructional design is often presented and explained through models [11].

### 2.2. Text Mining

Weiss, Induskhya, Zhang, & Damerou [12] indicated that data mining technology would find out the pattern in structure data base but not in none or semi structure data base. Hence, Hearst [13] pointed out that data mining would not be satisfied the human needs of pursuing information and knowledge.

However, text mining applied the language and statistics to analyze text data in order to attain new information [14]. Therefore, text mining technology became one of the important issues.

### 2.3. Disadvantaged remote education districts

The Ministry of Education in Taiwan promoted “Educational Priority Areas Program” to help the culture disadvantage school in enhancing the indigenous students’ living and learning facilities. Moreover, the “Potential Development Program” helped the indigenous students to explore their interests and then helped students entering high school or finding jobs. Nowadays, the “After School Alternative Program” emphasizes not only the indigenous students but also the culture disadvantage and low academic achievement students. This program integrates the school as well as the society resources. Some studies (Chueh, 2008; Chen, 2006) indicated that there were difficulties in implementation, such as, the source of students, the curriculum design and teaching materials [15]. In addition, conferences were hold to discuss the issue of helping disadvantage students’ learning. Many studies reported the results and provided suggestions from different points of views. For example, Lee (2008) indicated that the supports from school administration were important and suggested that building a connection between junior high school and University as partnership were essential to success [16]. Hsu and Chang (2008) reported the effects of teaching team to remote areas to show that the resources from university were the college students who were in the teacher education program [17].

Some studies focused on the philosophy of curriculum development for disadvantage students. Yu (2008) mentioned that because of social justice the definitions of disadvantage students were important and the sources of students needed to be defined also [18]. Huang (2008) pointed out that many different factors caused low academic achievement; however, one main cause was the remote areas [19].

This study used the qualitative process and computer technology to provide the findings.

## 3. Research Method

The research method of this study, first, applied the instructional design model. Then, the ground theory and text mining procedure was used. The research model combined three points of view: professor in action research, student-teacher in curriculum and instructional development and design, students in motivation and learning evaluation. The research model is in figure 1.

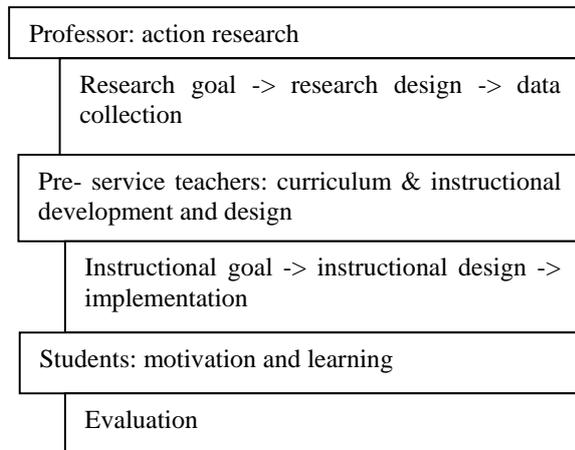


Figure 1 Research model in three points of view

### 3.1. Procedure

Following the research model, the research procedure is described as below. The research procedure was shown in figure 2.

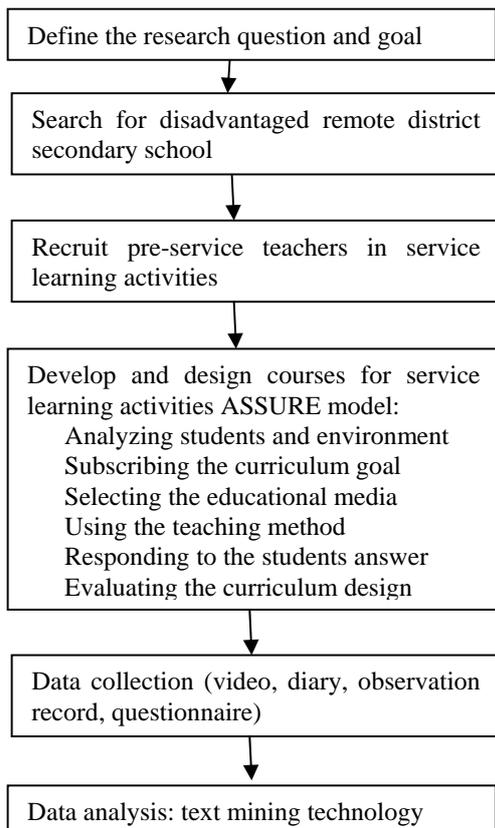


Figure 2 The research procedure

First, the research topic was continuing on weak tie study to innovate a better teaching method on disadvantaged students that would full fill social justice as being a teacher educator.

Second, the pre-service teachers were voluntarily joint the service learning research.

Third, the researcher as a supervisor helped the pre-service teachers develop the curriculum. The ASSURE model were applied into the curriculum and instructional design. During these three weeks, the pre-service teachers finished the courses design and did rehearsal by themselves.

Fourth, the pre-service teachers taking terms practiced their lesson plan with the secondary high school students. Some pre-service teachers would record the class observation. At the end of every day teaching, the pre-service teachers would hold a reflection meeting and then each of them would write dairy alone.

Finally, the observation types and diary were collected and analyzed.

### 3.2. Participants

The study was conducted with pre-service teachers and secondary high school students who were participated in “Educational disadvantaged remote district teaching service learning activities”. Fourteen pre-service teachers and twenty students were enrolled. 4 were male, 10 were female. Although these pre-service teachers have some tutoring experience, they all had not the experience in a real class. These pre-service teachers’ majors were variety, Math, English, Chinese, Japanese, and Business. The purposes of their attending were practicing their learning from teacher education program and increasing their teaching experiences.

### 3.3. Instrument

The instruments of this study were the pre-service teacher self-efficacy questionnaire, diary, and observation tables. The questionnaire contained 30 questions in 4 aspects, qualification, class management, teaching strategies, and the educational theory.

The diary were the reflection of self-reports. It would be evaluated in 7 directions:

- Content knowledge;
- General pedagogical knowledge, with special reference to those broad principles and strategies of classroom management and organization that appear to transcend subject matter;



results of reflection and observation, taking one course for example, would put together in order to considering as a whole picture which indicated in figure 6.

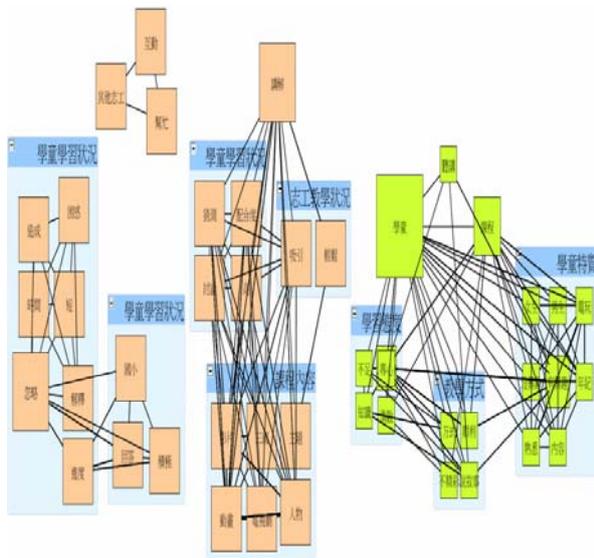


Figure 6. Integration of reflection and observation

The quantitative results although had no significant difference, the results of dairy self-reports which were analyzed by text mining technology were very abundant.

## 5. Discussion and Suggestion

The results from quantitative and qualitative data would provide information that researchers were interested. The discussion and suggestion were followed as below.

### 5.1. Discussion

The results from the pre-and-after test of questionnaire were not indicated that there was not a significant difference. The reason may due to that the service learning activities period was too short to appeared difference. Although it took 2 weeks for the pre service teachers prepared their lessons, the period of activities only for a week. Another interested point was the average score of the pre-test was higher than the after-test score. The reason may due to the reality shock which was very common for new learners.

The qualitative data from diary indicated that the interaction between teachers and students stimulated the reflection of the pre service teachers. The reason may due to the instant daily meeting and dairy writing.

The teaching and observing were all noticed the students' characteristic, however, the teacher noticed the learning behavior and the observer noticed the interaction between the teaching and learning. The reason may due to that the observers as an outsiders and the teachers as insiders took different points of view.

### 5.2. Suggestion

Service learning is one of the popular issues in nowadays education. Moreover, the pre service teachers practicing the theory in real world will help their learning in teacher education program. On the other hand, service learning activities in disadvantaged remote education district will achieve the goal of social justice. However, the research emphasizing teaching methodology in service learning is not much. Therefore, some suggestions are provided from this study.

For teacher educators:

Service learning in disadvantaged remote education district will help students learn which will under the educators' supervising. In order to improving the quality of service learning, the partnership between the university and secondary high school is important. Although the pre service teachers are running the activating, the pass on experience is a key for the successful of service learning activities.

For further research:

There are abundant goals and experiences need to be studied. The quantitative research, qualitative research and action research will be need in service learning and disadvantaged remote education.

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