

Chapter 11

A Study on a Problem-Based Learning Method Using Facebook at a Vocational School

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ABSTRACT

This study used a single-group pre-test/post-test design for a quasi-experimental study to implement a 12-week teaching activity. The research tools included a learning achievement test, a learning attitude scale, a portfolio assessment scale, a response and observation record form on Facebook, and a teaching reflection log. Each tool helped to identify the effect of problem-based learning on students' learning effectiveness and attitude. The following statistical methods were used to analyze quantitative data: descriptive statistics, one-way analysis of variance (ANOVA), nonparametric tests, single sample t-tests, dependent sample t-tests, Pearson product moment correlations, and Kendall harmony coefficients. The research results are as follows: (1) the teaching model of problem-based Facebook learning has a significant effect on the learning effectiveness of some students and has a positive effect on learning attitude; (2) there is a significant difference in the effectiveness of problem-based Facebook learning among students with different Website hosting experiences and among those who used Facebook's message function to varying degrees; (3) the problem-based Facebook learning has a significant impact on the effectiveness of the learning portfolios for students with different Website hosting experiences and message function utilization; (4) the problem-based Facebook learning method used for plant identification has a significant effect on the learning attitude of students; and (5) there is a significant positive correlation among the problem-based Facebook teaching of plant identification, students' learning effectiveness, and learning attitude.

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INTRODUCTION

Research Background and Motives

Currently, online interactive learning has been popularly applied in classroom settings, yet the solutions through the classroom use of multimedia have not been well-investigated. Therefore, the current study aims to explore the effectiveness of a problem-based learning method using Facebook to enhance the learning and attitude of sophomores studying agricultural at vocational high schools. Curriculum is an important means by which to achieve educational objectives, and teaching materials are important tools with which to put that curriculum's contents into practice. Because for certain subjects only a small number of students take elective courses, publishers are unwilling to edit or publish the relevant textbooks. As a result, the small academic departments that offer these courses cannot find suitable textbooks for those students. However, vocational schools, which often teach such subjects, play a very important role in the process of industrial development in Taiwan. The Department of Wildlife Conservation at the National Nei-Pu Senior Agricultural-Industrial Vocational High School is the only vocational high school where such a department exists in Taiwan. Plant identification is a fundamental course for the program, supported by comprehensive teaching materials and resources. There are approximately 800,000 to 1,000,000 species of plants around the world (Wei, Chen, & Chang, 1998). Various species of plants are distributed throughout the school roughly according to the distribution of plants in the world. Naturally, it is difficult for teachers to fit all of the world's plants into their teaching materials. Therefore, the department's teaching model has to be adjusted to achieve the best learning effectiveness.

Although there are abundant natural plants in the learning environment, it is impossible for students to confirm the accuracy of the information they read about plants. In addition, because there

are too many plants in the learning environment, it is hard for students to absorb the knowledge in a short period of time. However, the cooperative method of group learning can help reduce learning burdens and improve effectiveness. Through cooperative learning teaching activities, students can use various electronic media, such as smart phones or laptops to conduct Internet searches, while teachers provide guidance, diverging from past teaching methods to enable students to actively observe and summarize plant-related information. Problem-based learning, which is different from the traditional teaching model, has been comprehensively implemented in many fields. Its main attribute is 'activeness', favoring student-centered and 'problem-solving' approaches in which teachers act as designers and guides. Students must independently collect and arrange relevant information and participate in discussion and knowledge sharing mainly based on group cooperative learning (Hong & Lin, 2006). In Taiwan, relevant studies (Chang Lai & Yang, 2006; Chiu, 2003; Chi & Chang, 2001) have indicated that problem-based learning is a teaching and learning strategy worthy of promotion.

At present, herbarium-based traditional teaching is used in almost all of the plant identification-related courses in Taiwan, and many newly developed courses are still under design. The integration of problem-based learning and a Web 2.0 platform is an innovative teaching model. The Web 2.0 platform transfers the learning environment from the traditional classroom setting to a Web platform that enables students to actively interact with plants. Therefore, learning is no longer restricted to books and classrooms. This study selected a functional and easy-to-operate learning platform, Facebook, to assist students in understanding forage plants. This study conducted a teaching experiment to understand how the problem-based Facebook method affected the learning effectiveness, learning attitude, and learning process of vocational high school students studying plant identification.

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