Chapter 2.19
Enhancing Skills of Application Software via Web-Enabled Problem-Based Learning and Self-Regulated Learning:
An Exploratory Study

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ABSTRACT

The computer software education in vocational schools in Taiwan can hardly be deemed as effective. To increase students' learning motivation and develop practical skills, innovative learning designs such as problem-based learning (PBL) and self-regulated learning (SRL) are on trial in this specific context. We conducted a series of quasi-experiments to examine effects of these designs mediated by a web-based learning environment. Two classes of 106 freshmen in a semester course at Institute of Technology in Taiwan were chosen for this empirical study. Result sreveal that effects of web-enabled PBL, web-enabled SRL, and their combinations, on students' skills of application software have significant differences. The implications of this study are also discussed.

INTRODUCTION

Professionals with a vocational degree represent a major portion of the work force in Taiwan. Vo-

cational education is highly competitive in that it must attract enough student enrollments in the face of a continually decreasing birthrate and a rapidly increasing number of schools. Students in these schools tend to have lower levels of academic achievement. They spend more time on part-time jobs and do not get involved in their schoolwork adequately. They also care less about their grades. Teaching in such a context, particularly teaching the curriculum of application software, is a great challenge to most educators.

No one doubts the guiding principles of practical applications in the vocational education in Taiwan (Tai, Chen, & Lai, 2003). However, most teaching and learning efforts in this area have been devoted to helping students pass written tests, and, thus, receiving awards or official certificates. Schools, facing the high pressure of market competition, often emphasize the proportion of students awarded such certificates before they graduate instead of quality education. This materialistic aim puts students' attention less on mastering application software and more on preparing for tests through memorization. Consequently, a student who has passed the examination may still be unable to apply what was learned in school, and worse, lack motivation to learn more in the future.

The courses in application software traditionally emphasize memorization by applying short, disjointed, lack-of-context examples. There is a wide gap between what is learned in school and what is required in the workplace (Wu, 2000). In this regard, the computer software education in vocational schools in Taiwan can hardly be deemed as effective. In order to increase students' learning motivation and develop practical skills, problem-based learning (PBL) is considered to be the most appropriate. PBL uses real-world, simulated, contextualized problems in practice to motivate, focus, and initiate content learning and skill development (Boud & Feletti, 1991; Bruer, 1993; Williams, 1993). We believe that PBL could help low-academic-achievement students

to develop practical skills of application software through online courses.

Web-based instruction seems to be an ideal learning environment because students can access an almost-unlimited amount of information and apply it in multiple ways (Kauffman, 2004). However, implementing e-learning for low-academic-achievement students inevitably runs high risks. For instance, Internet addiction is quite common among low-academic-achievement students. When students enter the traditional classroom, they are used to logging on to MSN Web Messenger and checking their e-mail first. Many students like to chat with each other frequently via MSN Web Messenger, even though they are in the same classroom. They might browse shopping Web sites, even while a teacher is lecturing in the classroom. Thus, the teacher has to disconnect the network several times in his classroom to focus students' attention. It is even more difficult for students to concentrate on online learning because of this addiction to the Internet and a lack of on-the-spot teacher monitoring. To respond to this challenge, we propose an approach that can help students regulate their learning in a better way.

Success in online courses often depends on students' abilities to successfully direct their own learning efforts (Cennamo, Ross, & Rogers, 2002). It is very critical to develop students' self-regulation of learning before providing online courses to them. In web-based learning environments, physical absence of an instructor and increased responsibility of learners to effectively engage in learning tasks may present difficulties, particularly those with low self-regulatory skills (Dabbagh & Kitsantas, 2005). Student motivation may benefit from Web-based instruction with self-regulated learning (SRL) strategies. Students in the online environment, equipped with SRL competence, become more responsible for their learning and more intrinsically orientated (Chang, 2005). So self-regulation is important, particularly while learning in World-Wide-Web-supported environments (Winnips, 2000).

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