

Introduction

Global workplace is changing faster than ever before. Industries readily employ talent with versatility and problem-solving abilities. Problem-solving skill is a basic skill needed by today's learners in any workplace. Research shows that employers want employees who have interpersonal skills, can communicate effectively, are problem solvers and critical thinkers, and can work well with a team (Billing, 2003). Shivpuri and Kim (2004) reported similar results from a study of employers' needs from new employees in the workplace. Peddle (2000) concluded that college students in entry-level jobs have not acquired the transferable skills necessary for the workforce. Employers want these transferable employability skills in their new hires. It is becoming increasingly important for graduates to be able to apply the knowledge and skills learned in higher education institutions to the workforce (Crebert, Bates, Bell, Patrick, & Cragolini, 2004; Robinson & Garton, 2007; Watson, 2003; Yip, 2002). Thus, higher education is playing a critical role of promoting students' high-order thinking abilities. As long as high-order thinking is a desired outcome of education, we will need to find ways to help students improve their abilities to solve problems.

With the popularity of computer and Internet technology, information technology has been gradually embedded into learning activities in schools. For this reason, many countries start to place importance on the policy of the application of computer and Internet technology into education for the promotion of students' problem-solving abilities. Previous studies indicated that problem-solving ability is related to cognitive ability and learning skills. For example, Eisenberg and Berkowitz (1990) found the significant connections between information searching skills, problem-solving ability and knowledge structure of students. Bilal (2000, 2001, 2002) further indicated that the lack of effective information searching strategies and high-order thinking abilities would influence students' performance in searching information on the Internet. Hence, many research found that students' problem-solving ability can be facilitated through the integration of problem-solving strategies and computer technologies. For example, Yu, She and Lee (2010) investigated the effects of two factors: the mode of problem-solving instruction (i.e. Web-based versus non-Web-based) and the level of academic achievement (i.e. high achievers versus low achievers) on students' problem-solving

ability and biology achievement. The finding shows that Web-based problem-solving instruction has the potential to enhance and sustain the learner's problem-solving skills over an extended period of time. Chen and Hsiao (2010) applied Webquest model to learning activities to examine students' learning behaviors and cognitive changes between two music appreciation courses at one university. The result proves that Webquest model can promote learning performance in music appreciation courses and improve creative high-order thinking ability. However, very few studies have been conducted to investigate college students' online problem-solving abilities. This study attempts to investigate how well college students' problem-solving abilities through web-based inquiry learning environment, and accordingly provides proper suggestions for the need of discipline adjustment. In addition, to investigate the effects of our approach in depth, the cognitive styles of the students are taken into account while analyzing the learning performance of the learners.

Specifically, the study tries to achieve the following objectives: 1.to determine college students' online problem-solving abilities of Field Independent (FI) students and Field Dependent (FD) students via web-based inquiry learning environment; 2. to determine the difference in online searching behaviors between FI students and FD students via web-based inquiry learning environment; 3.to determine the correlation between cognitive styles and online problem-solving ability; 4.to determine the difference of technology acceptance between FI students and FD students.

Theoretical and Empirical Background

Problem-Solving Ability

With the rapid advance of information technologies, people need more effective ways and skills to handle large amount of information and solve complex problems than ever before. Problem-solving can be defined as the goal-directed sequence of cognitive operations in finding the unknown to resolve a problem situation (Anderson, 1980). More specifically, Sternberg (1988) defined problem-solving ability should encompass six skills: 1.identify the nature of problem; 2.choose problem-solving steps; 3.choose problem-solving strategies; 4.choose appropriate information; 5.allocate proper resource; and 6.monitor the problem-solving process. Bransford and Stein (1984) proposed IDEAL