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Using Web 2.0 technologies for improving problem-solving ability

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Abstract
The 21st century has witnessed new challenges and every day these challenges have proven that individual requires an advanced level of competitiveness to attain their goals magnificently in this working world. Facilitating learning through the usage of ICT is a critical part of modern educational system. Innovations in Information and Communications Technology (ICT), especially the so-called Web 2.0, are affecting all facets of our life. Web 2.0 technologies make use of the Internet to allow greater collaboration and sharing of resources among a community of learners. The technologies include wikis, blogs, social bookmarking and social-networking sites. Problem-solving skill is one of the 21st century skills needed by students to be competitive in the future working world. Students' troubles with problem solving can be specifically evident in technology-based learning environments that frequently require careful planning and progress monitoring to use effectively. Web-based systems have been developed to support problem solving ability. The popularity and familiarity of Web 2.0 technology may attract students to participate actively in discussions and encourage peer collaborations in online social problem solving environment; hence, helping to improve students' problem solving ability.

Keywords: Problem Solving Ability, Web 2.0 Technology

Introduction
With the escalation of Internet, large number of students found preference to information and communication technologies as learning tools. The World Wide Web (WWW) nowadays has become one of the most essential information sources in both personal and academic life. Web 2.0 Technologies has the potential to be use as tool in learning environment to enhance problem-solving ability of students. Such technology enables students to stay connected and learn at any time despite being in different location. Moreover, students use the Internet extensively both for completing assignments and entertainment. Students face serious problems in such skills as recognizing the relevant information, probing or searching, tracing and processing information from the web. To tackle this problem, teachers must instruct their students clearly and properly.

Integration of appropriate technology to cater the needs of the student will be able to support teachers in their teaching effectively. Then students will be motivated to take part in the activities organized. Previous online medium researches involving problem-solving skill and activities were online forum, e-learning; blog and social networking site (Noor Hidayah & Zaidatun, 2014) [10]. Just like classroom learning, online learning too involves psychological processes such as thinking, remembering, interpreting and problem-solving (Castle & McGuire, 2010) [1]. Thus, using Web 2.0 Technologies in the formal academic context within informal setting will surely attract the students' participation to interact. At the same time this will increase their excitement level and heighten their motivation to actively participate as their preferred mediator is being used as the communication tool.

Problem Solving Ability is considered as one of the basic ability need to be mastered by students during their education before going into the working world. Individual competence will not only be governed by academic achievement but also on the ability of their problem-solving skill as independent worker. However, the situation is quite different in real settings. The basic of student's performance assessment spotlights mostly on the intellectual aspect while less importance is given to the development of other abilities or skills. Despite knowing the significance of problem-solving ability, it is still ineffectively trained to students

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even at the early age, due to less exposure given to students during school years. Thus, there is a prerequisite to instill problem-solving ability in the early age.

Polya (1973) [11] gave the problem-solving definition that is to find an unspecified way out of a trouble or to overcome the difficulty. This definition then refined by Anderson (1980) by complementing sequence of cognitive operations that assist to direct the process to reach the desired goal. Problem varies in terms of its type or appearance, knowledge needed to disclose the solution, and the mechanisms involved to resolve them.

Problem-solving ability has been acknowledged as a critical skill for adapting to the living environment of the 21st century (Kuo, Hwang, & Lee, 2012) [8]. It consists of six phases that is, identifying the nature of the problem, determining problem-solving steps, determining problem-solving strategies, selecting appropriate information, allotting proper resources, and supervising the problem-solving process (Sternberg, 1988) [14]. Owing to the popularity of information and communication technologies, recent studies have shown that problem-solving ability of students can be nurtured by conducting learning activities on the web (Chen, 2010) [3]. Such type of activities have been called web-based problem-solving activities, and encourage students to ask a series of questions related to a specified issue via identifying the nature of the questions, determining the keywords, searching the potential web resources, choosing the suitable web pages, conceptualizing the related information, and summarizing the information (Hwang & Kuo, 2011) [6].

Sivakkumar and Muhammad Sukri (2014) [13] states that teaching quality and appropriate time provision are the aspects that affect effective teaching. Teaching quality indicates teacher's ability to use clear and comprehensible language, organized presentation, and relevant examples comprising whole some teaching material that assists to explain a concept in a way that can be easily comprehended by students. Majority of these teaching strategies employ open-ended structure problem in an authentic real life situations to solve non-routine problem. The capability to resolve non-routine and open-ended form of problems will potentially enhance ones confidence to solve real life troubles (Kivunja, 2014) [7]. This will give vision to the students on how the problem occurs in the real life settings.

Web 2.0 Technologies can be integrated with learning by offering a promising learning platform for collaborative interaction between learners and teachers. Integrating Web 2.0 Technologies as additional to existing teaching practices build an informal learning environment that can improve the delivery of learning and provide opportunities to embed skill learning. Activities that comprise of exchange of ideas, discussion, sharing materials and information to aid the learning process in turn can have positive effect on performance and development of students' problem-solving skill (Leng et al., 2011) [9].

In the past few years, numerous studies have been done to examine the effectiveness of web-based problem solving for different courses, such as physics (Chandra & Watters, 2012) [2], biology (Yu et al., 2010) [15], mathematics (Rae & Samuels, 2011) [12], social science (Kuo et al., 2012) [8], and computer studies (Huang et al., 2012) [5]. Most of these studies have stated positive effects of directing web-based problem-solving activities.

The World Wide Web offers many benefits, such as immediacy of information, variety of data, and convenience of data accessing. For solving their problems or finding answers to their questions, students mostly choose the Internet as a convenient medium for getting relevant information (Chandra & Watters, 2012) [2]. Therefore, educators have highlighted the significance of nurturing students' abilities of searching for and using information on the web for problem solving. To accomplish a web-based problem-solving task, students need to understand the issues raised by the teacher, determine the keywords for information searching, select the searched web pages, extract and organize the selected information, and summarize their findings.

On the other hand, researchers have noticed that students are likely to get confused while searching information for solving their problems on the web without proper learning supports. Furthermore, it might be difficult for some students to obtain and systematize the information from the web, especially for young students (Hargittai, 2006) [4]. Therefore, it is necessary to offer learning supports to help students extract and systematize information when designing web-based learning activities.

Thus, it can be said that teacher must take initiative to improve their teaching by adopting novel teaching strategy and innovative technology. Teaching-learning process that efforts on cultivating skill involving thinking should not be tied only to rote learning. Problem-solving skill require the learner to communicate effectively and apply knowledge with the purpose of attaining the goals that indirectly contribute to improving argumentative skill and decision-making skill. Students' difficulty to solve problem should be dealt with suitable approaches and strategies that can promote students' way of thinking thus enhancing the skill to solve problem that is in line with the needs of the working world in the future.

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