

Is Sakai Online Visual Learning Suitable for Cultivating Thinking Skills in Malaysia's Higher Education?

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Abstract

In Malaysia, teachers are very curious in finding out what strategy or model or a platform readily fosters critical and creative thinking skills on the students. The advent of web-based learning platform, as an interactive idea that utilizes web and technological instruments that are either electronic or web-appropriated or web-fit for the purposes of teaching and learning. This study presents a review on web-based learning which provides a judgement on the cultivation of thinking skills through Sakai, online visual learning platform in Malaysia's educational institutions. A systematic review is made on the previous research related to online visual learning that were published between 2010 and 2017 concentrating on web-based learning that enhances creative and critical thinking skills as well as effective instructional materials. Discussions are focused on the recently emerged improved version of web-based learning platform called "Sakai" with which teachers can utilize various strategies and tools from the platform in virtually many devices such as computers, smartphones and tablets to design an instruction that will cultivate critical and creative thinking skills in their students. In conclusion, the promotion of thinking skills is still the focus subject and the most important aim of education in Malaysia. Hence Sakai as an important visual learning platform has a promising path for cultivating those skills required in the Malaysian educational system that has gone through a transformation since the improvement of web technology.

Keywords: Sakai; Web-based learning; Thinking skills; Visual learning

Introduction

Background and Overview

Almost every accomplished professional teacher will not fail to recognise that a significant number of his or her students happened to acquire more skills in utilizing a certain program on a computer device. Educating or assessing students without computers and electronic instruments makes the process of learning more boring to the learners (Eady & Lockyer, 2013). The moment learners invested their energy and time in utilizing a certain computer (online specifically) programs or tools or instruments, at that point they will seem to develop thinking skills in utilizing those instruments. In a century, among the most important aims of education considered by Malaysian society is enhancing critical creative thinking skills among the students which prepare them to serve efficiently in their workplace and to be a valuable citizen of the nation (Haghparast, Nasaruddin, & Abdullah, 2014).

Studies demonstrated that great majority of Malaysian children spend more time in playing video games, watching television and electronic media than they do spend in the classroom. These same set of children happened to acquire skills more easily when an instruction is presented in an online platform that makes them feel they are interacting with the world than merely non-technological instructional instruments.

Rationale and Objectives

Online instructional platforms give students access to the learning material prior to the instruction which includes content of the lesson in text form, auditory recording, video clips, and links to other online relevant assets, for example, multimedia learning aids and intelligent practice tests that cultivate thinking skills on the learner (McKenzie et al., 2013). “The better students are prepared, the more learning that can be achieved” (Herreid & Schiller, 2013).

An online program was introduced in Malaysia educational institutions called “Sakai” as an active web-based learning that enables classroom teachers to convey instructional materials to their students, administer the effective assessment to trace students’ advancements or progress in learning of both the content and the skills. In all forms of online learning platforms used in classroom instruction, online active learning works best (Herreid & Schiller, 2013).

This study aims to find out through systematic review whether Sakai online visual learning is suitable for cultivation of thinking skills in Malaysia’s higher education. Therefore, it was set to answer the question “Are classroom instructions delivered via Sakai cultivates thinking skills in students of higher education in Malaysia?”

Review of Related Literature

Web-based learning and Sakai as the Visual Learning Tool in Malaysia. Web-based learning is another interactive idea that utilizes web and technological instruments that are either electronic or web-appropriated or web-fit for the purposes of teaching and learning (Haghparast et al., 2014). Sakai is a new web-based educational platform intended to facilitate cultivation of thinking skills in the students through classroom instruction, research studies and cooperative learning in a formal setting. Created by a group of scholastic foundations and business associations, Sakai was adaptable to any educational institution, dependable on the provision of effectiveness in teaching and learning, extensible in the cultivation of thinking

skills on the learner and efficient in communicating and exchanging data within which classroom members are enrolled in the online platforms. Through programming and the utilization of modules, a teacher can develop interactive classroom activities in an online platform (that may include self-assessment) in the form of higher level drill and practice, simulation, gaming, inquiry, collaborative and even problem-based as well as project-based activities (McKenzie et al., 2013).

Cultivation of thinking skills through Sakai. In more specific terms, distinctly Sakai encourages cultivation of thinking skills in the individuals of an academic environment that utilized it in the instructional process, furnished them with the instructional structures for projects, inquiry, and collaboration. It attempts to advance more extensive appropriations in the learning environment, thereby providing access to the modelling ways to deal with classroom instructions and research communities. It also allows the teachers and the students to manage the content of instruction. Hence, the name ‘content management system’.

The teacher can easily design a planned lesson, create its activities and assessment while the students who were enrolled in the class have access to learning resources (Figure 1), store or download resources, respond, perform and even share with the other community.



Figure 1. User interface of the learning management system (Sakai).

Conceptual Framework of the Study

The concepts involved in this study were represented in Figure 2 and the framework that guided understanding of Sakai as learning tool as well as its power in cultivation of thinking skills to the upcoming generation taught in higher institutions of Malaysia. Sakai can be seen or perceived by the learners as an online visual learning tool or web-based learning tools which direct the development of thinking skills enrichment. In the case of learning by using this platform, students are exposed toward learning effectiveness with the support of its interactive nature in motivating and maintaining interest throughout the instruction.

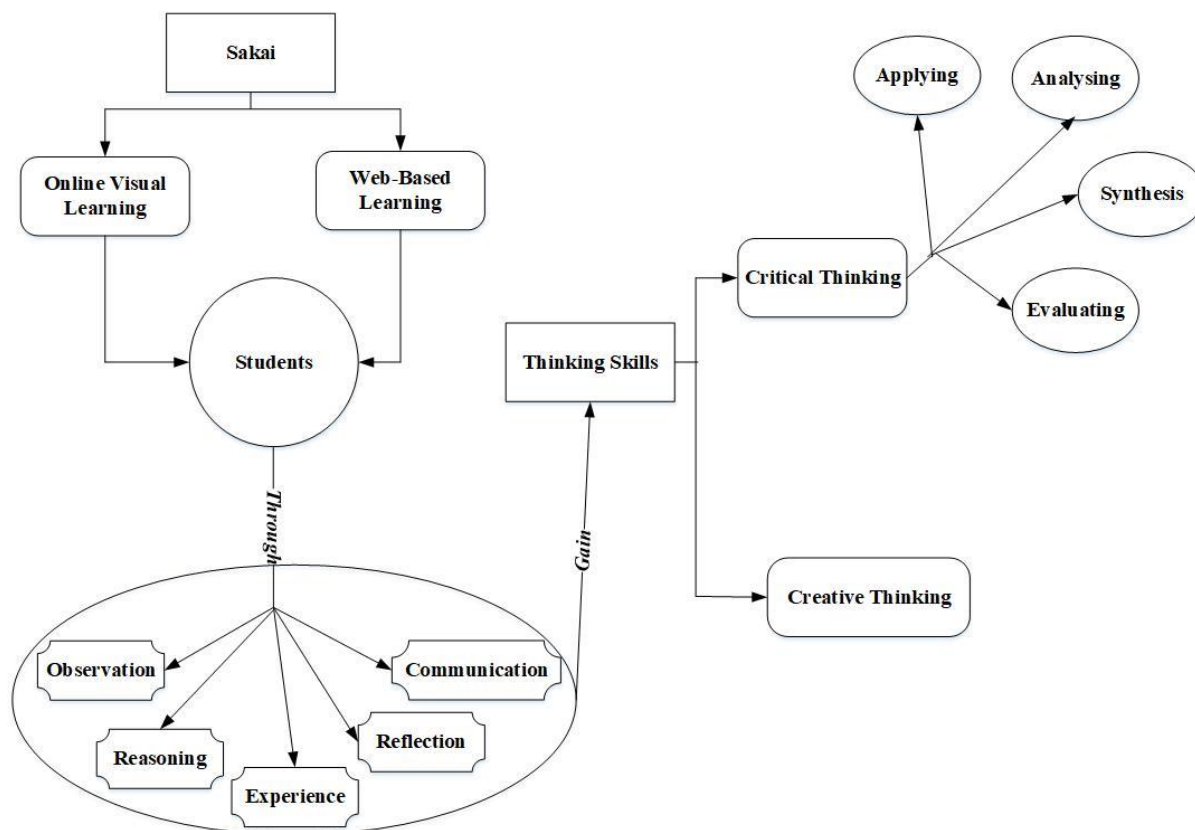


Figure 2. Conceptual framework of the study.

Thinking skills are the mental activities we use to process information and can be classified into critical and creative as illustrated in Figure 2. The critical thinking skills always require learners to use higher level of cognition in the Bloom's Taxonomy. These involve applying, analysing, synthesis and evaluating. Students develop thinking skills from the observation made on the materials/information presented by the Sakai platform (i.e. developed, designed and organized by the teacher), use their experience as well as reflect on learning and learned materials to contribute effectively to the classroom discourse. They also make sense of appropriate approach to respond to the task provided by the teacher through reasoning and communicate their ideas in a comfortable manner.

Methodology

This study is a systematic review of previous research on online visual learning that were published between 2010 and 2017. It considered only those studies which were conducted in high level institution of learning and were written in English language. It solely concentrated on web-based learning that enhances creative and critical thinking skills as well as effective instructional materials. This study will be using the following terms interchangeably to mean the same thing i.e. "visual learning", "online learning" and "web-based learning".

Seven databases were searched including Springer, science and education (ELSEVIER), ERIC, SCOPUS, Web of Science, Google Scholar and Journal of Computer Assisted Learning. The search criteria include the following keywords, i.e. creative thinking, critical thinking, web-based learning, online learning, and visual learning.

The analysis of data from over 11,037 and above studies through the search engines were obtained. The title and abstract were the first format used in screening the qualified articles for the study. By using text analysis procedure, the full text of 26 articles were read to make sure that the questions stated in each article were answered and relevant to the current review. A total of seven articles met the criteria for this study.

After carefully reading the content of the seven articles selected, the focus subjects were identified and are classified under the following subheadings as shown in the Table 1 below:

Table 1
Summary of Research Findings Extracted from Seven Articles Reviewed

Author & year	Aims	Research finding	Conclusion
Petctone & Sumalee (2014)	To investigate internal and external validation of web-based learning environment to enhance critical thinking skills for undergraduate students.	The result indicate that the learning content, the media presented by the teacher and the design of the web-technology were suitable for constructing of critical thinking skills.	Instructors should make use of learning from the web to cultivate thinking skills.
Haghparsat et al. (2014)	To assess the level of critical thinking developed using e-learning instrument in teaching and learning.	E-learning provides the easiest approach for cultivation critical thinking	The society and the world at large need to have people with critical thinking skills in their educational institutions and the other workplaces.
Sirisopon and Sopeerak (2013)	To (i) construct web-based instructional model for development of critical thinking in undergraduate students; (ii) compare critical thinking score before and after learning through web-based platform; and (iii) examine student satisfaction on learning through web-based platform.	Students' critical thinking scores were extremely higher after learning through web-based platform than before learning through web-based platform. Students have high satisfaction level toward learning through web-based platform.	The web-based learning platform designed by this study can be used in real life classroom environment to cultivate critical thinking skills on the students
Salleh, Tasir and Shukor (2012)	To develop web-based simulation learning framework that enhances students' critical thinking skills among the undergraduate students.	Web-based simulation learning framework has a positive impact on students' critical thinking skills.	The designed framework can be used to facilitate the cultivation of critical thinking skills
Saadé, Morin and Thomas (2012)	To utilize web-based learning as virtual learning environment in classroom instruction and	The result expressed the significance of interactivity of web-	Teachers need to incorporate more interactive

	investigate on the part of the instruction and to what extent critical thinking skills are developed	based learning resources in cultivation of critical thinking skills and that virtual learning environment foster critical thinking skills.	component into their classroom instruction which will keep students connected to one another thereby facilitating development of critical thinking.
Kuo, Chen and Huang (2014)	To develop effective instructional strategy that will enhance students' ability to solve problem in a web-based platform	Creative thinking increases students' ability in using web-based learning resources.	Creative thinking is proven to be valid and reliable in web-based learning assessment.
Hew and Cheung (2014)	To (i) examine the level of motivational and challenges of using web-based learning resources as well as (ii) identify the important issues that are yet to be addressed	The results indicated that (i) there is strong desire for students to learn new concept and curiosity about web-based resources; (ii) there is lack of students' participation in an online forum.	The quality and assessment of web-based learning resources should be improved.

Discussion of Findings

The review is systematically done to provide the basis that can answer the question “Is classroom instruction delivered through Sakai platform cultivates thinking skills in students of high education in Malaysia?”

In response to the research question, the authors will first elaborate on the features of Sakai that support educational instruction as summarised from the systematic review. Then the advantages of Sakai will be elaborated and discussions will be made on how these features enhance creative and critical thinking through Sakai online educational platform.

Features of Sakai that Support Educational Instruction

Sakai is simply an online active learning platform that engages its users into more advance inquiry and collaborations where resources are sufficiently relevant and available. It is a system of delivering educational content and training programs.

The following are some of the significant attributes of Sakai in which this study considered relevant for the cultivation of thinking skills in the students:

I. Document distribution

The instructor has the ability of sharing different document to his or her enrolled class members that suit the specific needs of the learner. To make sure that teachers meet the differences of their individual students, Sakai educational platform provided them with easy tools that will allow the creation of varying materials and share them to the required places without overloading the other members with materials that may not have been significant to them. It

also has an electronic portfolio through which the students can receive the instructional material and activities electronically during the classroom instructional process.

II. Gradebook

Numerous online educational instructions have an end process goal which is likely to be a summative assessment that may determine the completion of the learning target (Barrington, 2014). Sakai is basically intended to give faster, easier grade entry with automated saving and score validation. It has an adaptable display option for the summative assessment that includes letter grades, average, percentage and points for the grades which can be easily imported or exported to the external source by the user. This feature is what is referred to as “gradebook”. Gradebook is an important instrument that will enable the teacher to manage the online resource for his/her educational instruction and keep tabs of the student's development through assessment and required exercises (Barrington, 2014).

III. Responsive user interface

Many people access online learning platform with their smartphone, tablets and computers, as such, it is more apparent for Sakai to provide suitable viewing on relatively small and large resolution screens. For an online database which is designed for the instructional purpose, the sort of user experience that guarantee favourable interface and feedback must be delivered (Gardner, 2011). Responsive use interface is a display that can be adapted to any gadget thereby creating a suitable user experience that depends on the nature of all systems (Fadeyev, 2009). Voutilainen, Salonen and Mikkonen (2015) state that responsive user interface platform is adaptable to the different type of gadgets which range from smartphones to computers ‘and optimize viewing experience for the device at hand’.

Sakai provided a more satisfying design for any user through enhancing more efficient user experience on any gadget ranging from computer devices to tablets and smartphones. Teachers can change the content, styles and the appearance to their own satisfaction and best ways that can foster learning easily. Once the essential support needed to facilitate learning are satisfied, students tend to develop an experience that easily broadens their thinking skills.

A successful platform like Sakai used collaborative channels in the educational instruction not only to engage the enrolled students but also to change their behaviour towards developing thinking skills (Gardner, 2011).

Other features include PA system, mathematical notation, improved assessment including multiple choice test through which the student can have self-assessment, lesson tools enhancement with improved discussion forum, and the intelligent feedback (Figure 3).

Assignment Title	For	Status	Open
Homework 1 Submit as Student	Entire Site	Not Started	May 1, 2016 12:00 pm
Homework 2	Entire Site	Not Started	May 7, 2016 12:00 pm

Figure 3. Assessment schedules in Sakai.

Advantages of Sakai

As the next generation digital learning environment, Sakai has the following advantages over other online platforms used for instructional processes:

- I. It allows the teachers to arrange their learners into different groups with distinct roles that will promote development of deep understanding of the content and the cultivation of a critical mind that employs reasoning in solving problems.
- II. It served as an asset that provides resources which are closely related to the learning content and task or activities assigned to the students by the teacher.
- III. It can accommodate and provide different form as well as phase of assessment in teaching and learning.
- IV. It provides validated activities that can be scaffolded on the level of difficulty to test and promote thinking skills in the student
- V. It is a collaborative instrument for research and group projects.
- VI. It has flexibility in the sense that, instructional processes can be delivered through different activities.

Enhancing Creative Thinking in Sakai Online Educational Platform

Kuo, Chen and Hwang (2014) have proven the necessity of designing effective web-based instructional strategies through creative thinking approach to enhance optimum students' performance. The result of their study indicated that the students of higher education not only have their learning outcome improved but also creative thinking was cultivated through online learning platform. Sakai is essentially designed to be adaptable to any form of instructional

strategy that facilitates the development of skills like creative thinking skills. This also justifies the significance of expanding development in the utilization of web-based visual learning for classroom instructions in Malaysian learning institutions specifically those with the opportunity of employing and integrating active learning pedagogy where students can collaborate on their own and also where thinking skills are readily enhanced (Salleh, Tasir, & Shukor, 2012).

Enhancing Critical Thinking in Sakai Online Educational Platform

Critical thinking is the intellectually disciplined process involving active and skilful conceptualization, application, analysis, synthesis, and/or evaluation of information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action (Linda, n.d.). Sakai is the form of virtual learning tool that foster cultivation of critical mind and its thinking skills on the student through series of models that can be easily represented for educational purposes. This can be understood following the results of critical thinking skills developed by the students of higher institution of learning in an online visual learning environment like Sakai. The result of the study conducted by Saadé et al. (2012), indicated the importance of interactivity of online visual learning materials in the cultivation of critical thinking skills of the students. Students tend to acquire thinking skills more easily when confronted with learning materials in an online environment.

Requirements for the advancement of critical thinking in virtual learning environments such as Sakai appear to be more inspiring than in any other classroom setting in Malaysia (Salleh et al., 2012) because its foundations were based on creative instructional methodologies, for example, constructivist learning rationalities, active learning, cooperative learning, and dialogue utilizing computerized media. Saadé et al. (2012) suggested that online learning platform like Sakai can really help by giving students a chance for mastery of learning, an expulsion of time-limitations for learning, self-managed learning, and unlimited online discourse. Sirisopon & Sopeerak (2013) also constructed a web-based instructional platform to investigate the development of critical thinking skill in the students in which they found that after learning from the online instructional system the students' critical thinking scores were extremely higher than before learning from the web. Petchtone and Sumalee (2014) investigated the internal and external validity of interactive web-based learning environment designed for cultivation of critical thinking skills on the students and the results indicated that the learning materials prepared by the teacher on the web, the instructional media used for the instruction and the user interface of the online platform which was so interactive were supportive in the cultivation of critical thinking skills. In fact, Sakai, as one of the web-based tool, with a visual learning framework has a positive impact on the students' critical thinking skills (Salleh et al., 2012).

Conclusion

Summary and Limitation

Critical thinking skills are the central theme in today's classroom as well as the places of work in this century. The advancement of online platform changed the mechanism through which critical thinking is fostered on the students (Saadé, Morin, & Thomas, 2012). This study presents a review on web-based learning which provides a judgement on the cultivation of thinking skills through Sakai, online visual learning platform in Malaysia's educational institutions. The review of previous studies indicated that virtual learning platform like Sakai

has demonstrated their capabilities of developing thinking skills in the learning in a more efficient way. Sakai is not just an educational platform for teaching and learning of content of the subjects or courses but also as a medium of training thinking skills to the young generation in Malaysia. However, it is still not commonly used in the Malaysian classroom settings, hence this study is limited by findings obtained from empirical study due to the constraints faced in terms of time and resources available.

The review does not form the final or total conclusion for the effectiveness of Sakai as a learning management system for cultivating thinking skills. Thus, its limitation remains subject to empirical investigation that could provide details implications of the platform for learning in-and-outside classroom environment.

Implication and Recommendations

In Malaysia, teachers are very curious to find out what strategy or model or a platform could foster critical thinking skills readily on the students. Many scholars vested their efforts on other strategies except for Haghparast, Nasaruddin, & Abdullah (2014), who viewed the relevance of online learning platform in education in which they believed has facilitated a lot of difficulties in teaching and learning. They believed that in the advent of web-based learning platform, of which Sakai is providing an interactive visual learning environment, teachers can utilize various strategies and the tools from the platform in virtually many devices such as computers, smartphones and tablets to design an instruction that will cultivate critical thinking skills in their students.

Malaysian society is very sensitive to what best could be harvested from today's educational system by their citizens who are expected to be valuable members of the community, which is thinking skills. Hence more studies are recommended to implement this tool in various educational settings and encourage teachers to give more emphases on web-based learning as it demonstrates its strength in tackling educational challenges in the classroom instruction. With the advancements of this web technology, teachers used varying strategies to cultivate thinking skills in their students through instruction they present in an online platform, and Sakai could be considered as online visual learning suitable for cultivating thinking skills in Malaysia's higher education.

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