

Collaborative Learning Tools in Higher Education: Literature Review (2007-2012)

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Abstract: Critical roles of information and communication technologies in teaching and learning process, trend of new generation of learners, and importance of collaborative activities in higher education, lead researchers to this point that study of collaborative learning technologies, tools, and processes is increasingly worthwhile. Therefore, the purposes of this study were to identify the most common collaborative learning tools using in higher education and to investigate the main phase of collaborative learning process, by reviewing the related literature from 2007 to 2012. The results showed that wikis are most popular collaborative tools using with the purposes of creating knowledge and improving communication aspects in collaborative teaching-learning process. Moreover, results suggested that unsuccessful use of wikis for chat and discussion, limited multiple user editing, technical problems, too unstructured platform, lack of motivation, privacy and security issues are most common constraints of using wikis from user's points of view. In conclusion, with many of the constraints regarding previous collaborative learning tools and emerging new web technologies such as cloud computing, it is expected that wikis will be replaced by cloud-base applications in order to outweigh benefits rather than limitations and empower group project activities.

Key words: Collaborative learning, Wikis, Knowledge creation and ideation, Communication, Constraint

INTRODUCTION

Recently, the rapid spread of information and communication technology has changed the common ways of communication and information sharing. New technologies have brought the innovations in every aspects of the society and more importantly in teaching and learning process in higher education. These innovations have improved the process of communication, interaction, and knowledge sharing between individuals and groups (Avcı and Askar1, 2012). Today's classrooms are constantly changing. The findings of study conducted by Shamaa and Hassanein (Shamaa and Hassanein, 2011) indicate that students are more satisfied with online concepts, online help, and accessibility of course instructions. New generation of students who are known as digital natives, the Net Generation, Generation Y, cannot live in the world without internet (D. G. Oblinger and Oblinger, 2005). These students can perform multitask with various forms of technology which may enhance their confidence more. Furthermore, they are team oriented and have less interest to work independently (Ananiadou and Claro, 2009; Howe and Strauss, 1993; D. Oblinger, 2003). They prefer to work cooperatively on projects and participate within collaborative group settings. As a result, they like to socialize and share their knowledge and thoughts within group environments dynamically. In order to meet the needs of these students and engage them more within learning process, educators should understand their audience and work in collaboration with them by using different delivery methods (Monaco and Martin, 2007). Consequently, Colleges and universities are looking for different methods to meet the expectations of students for new service, immediacy, and group activities (D. Oblinger, 2003). Moreover, educators are trying to understand their audience and work in collaboration with them by using different delivery methods, to meet the needs of these students and engage them more within learning process (Monaco and Martin, 2007). Web 2.0 which is a set of internet services enables internet users to actively build and share knowledge through different communities. This technology improves group interaction and encourages a sense of community and facilitates more collaborative ways of working (Avcı and Askar1, 2012). Blog, wiki, Flickr, RSS, Facebook, podcast are some examples of web 2.0 technologies which are also called social software tools.

By considering the critical roles of information and communication technologies in teaching and learning process, trend of new generation of learners, and importance of collaborative activities in higher education, this paper is aimed to review literature covering collaboration learning from 2007 to 2012. Therefore, the main goals are answering the following research questions:

- A. What is/are the common collaborative learning tools using in recent researches (from 2007 to 2012)?
- B. What is/are the main phases in collaborative learning process?
- C. What are the constraints of this collaborative learning tool?

Collaborative Learning Definitions:

Despite the term of collaborative learning (CL) has been widely used in different disciplines, there is no unique and consensus definition of this term (Jenni and Mauriel, 2004). In order to understand the exact meaning of CL, it is appropriate to refer to the different definitions presented by experts in the field. As follows:

- Collaborative learning (CL) is an educational method to teaching and learning that involves group of learners working together to solve a problem , complete a task, or create a product (Laal and Laal, 2012).
- The term CL refers to an instruction method in which learners at various performance levels work together in small groups toward a common goal(Laal and Laal, 2012).
- CL is interpreted as different forms of interaction which may be face-to-face or computer-mediated in which two or more people learn or attempt to learn something together. (Dillenbourg, 1999).
- CL has as its main feature a structure that allows for student talk, in which students are supposed to talk with each other, and in this situation much of learning occurs (Golub and Committee, 1988).

As in CL environment the learners have to listen to different perceptions and are required to defend their ideas, it can affect them both socially and emotionally. In CL settings, small group of students help each other to learn more. It is misunderstanding about CL that students work individually while talking to each other. It is not having them do the task individually and then have those who finish first help those who have not yet finished. And it is not having one or a more students complete the task, while the others append their names to the report (Klemm, 1994).

According to Diaz *et al.* (2010) collaborative e-learning is defined as “constructing knowledge, negotiating meanings and/or solving problems through mutual engagement of two or more learners in a coordinated effort using Internet and electronic communications for some or all of their interactions.”

Jigsaw, Group Investigation (GI), Co-op, Student Team Achievement Division (STAD), Team Games Tournaments (TGT), and Learning Together (LT), Inquiry Based Learning (IBL), Problem Based Learning (PBL), and Project Based Learning (PBL), are some examples of collaborative learning activities (Suh, 2011).

Project-based Collaborative Learning:

Laal and Laal (2012) claim that Group/team project collaborative learning that technology is enabling, is a new pedagogical approach for 21st century learners.

As from the name of project-based collaborative learning can understand, it is a combination of two related approach —project-based learning and collaborative learning. Project-based collaborative learning is a problem-based method to teaching and learning. Project-based learning is based on engagement of students in design, problem-solving, decision-making, and investigative activities; often an artifact or product will be the outcome ("Project-based learning," 2008). Based on Laffey *et al.* (1998) project-based learning is defined as a form of contextual instruction which is based on student problem-finding and is usually completed out over extended periods of time.

Collaborative learning is based on joint intellectual effort of groups of students who are working for a solution or meanings (Smith and MacGregor, 1992). Both approach are focusing on a problem which organize and drive activities (Deal, 2009). Figure1 illustrates this combination.

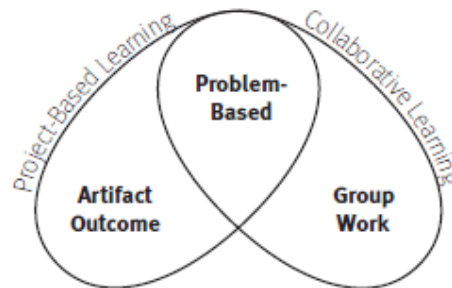


Fig. 1: Project-based collaborative learning (adapted from (Deal, 2009))

Therefore, project-based collaborative learning can be simply defined as: a group of people working together to create an artifact and to meet clear learning objectives throughout the certain process. Furthermore, project-based learning (PBL) can be described as a model that organizes learning around projects (Thomas, 2000). Rapid advances of online communication tools, emergence of new technologies, and the expansion of online communities have introduced different types of technologies for collaborative learning (Suh, 2011). There are varieties of technologies that can be used for project-based collaborative learning, but they are often considered as a single label: “collaboration tools” (Deal, 2009).

Deal (2009) divided the project-based collaborative learning activities into seven categories and proposed a high-level view model for these activities. In this model collaboration process and list of tools and technologies supporting each phase are presented (figure 2). It is clear that the processes of collaborative activities are not strictly linear and selecting appropriate collaboration tools is totally depend on the objectives of the assignment and requirements of the individual learning activity.

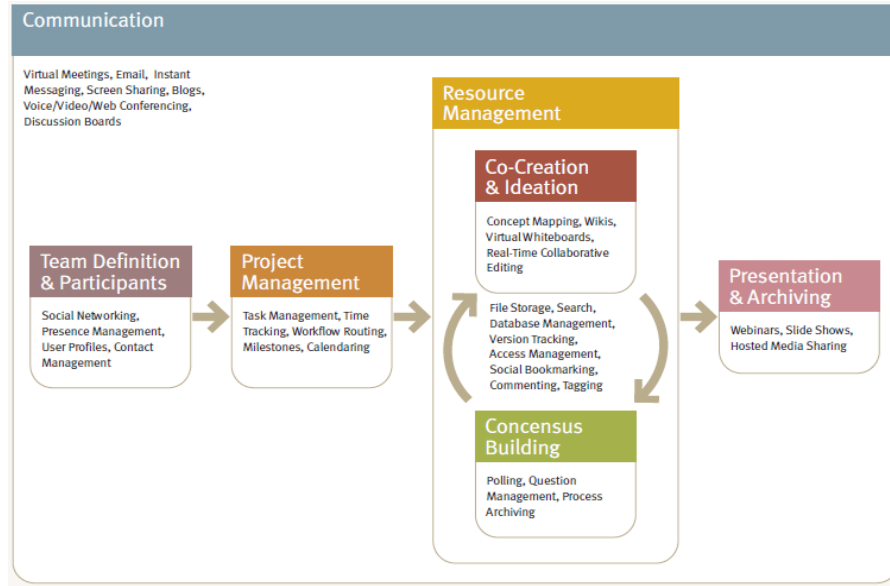


Fig. 2: Modell: project-based collaborative learning process and available tools and technologies (adapted from (Deal, 2009))

Furthermore, Diaz *et al.* (2010) argue that collaborative e-learning is a coordinated effort using synchronous or asynchronous tools such as e-mail, web conferencing, instant messaging, wikis, and threaded discussion forums.

General collaborative learning model (adopted from Lee *et al.* (2004)) is illustrated in Suh (2011) study. This model consists of five phases that promoting participants interaction and collaboration in order to achieve individuals' and teams' goals. The first phase is "identifying learning tasks". In this phase students understand learning goals and evaluation methods. In the second phase "team building & planning", students organize group goals and divide the roles and arrange team learning plans by using team arrangement functions and discussion board. In phase three "individual learning" Identifying individual tasks and individual learning outcomes using personal performance supported tools are considerable. Intra and inter team learning is occurred in "team learning" phase. In this phase students share and exchange their ideas and outcomes within team or even in different teams in same class or different schools. In the last phase "sharing and evaluating learning outcomes", teams peer evaluate and give feedback on learning outcomes of other teams using communication tools and evaluation functions. Table 1 shows this model and supported technologies for each phases.

Table 1: Model 2: general collaborative learning model and supported technologies (adopted from (Suh, 2011))

Phase	Sub-processes	Supported technologies
Identifying Learning Tasks	<ul style="list-style-type: none"> Identifying Learning Goals, Processes & Methods Identifying Evaluation Criteria & Methods 	Task Orientation & Guidance Tools
Team Building & Planning	<ul style="list-style-type: none"> Organizing Teams for Group Goals Dividing Roles of Members Arranging for Team Learning Plans 	Team Arrangement Function Discussion Board Schedule Management Function
Individual Learning	<ul style="list-style-type: none"> Investigating Individual Tasks Producing Individual Learning Outcomes 	Personal Performance Supported Tools Resource Room Searching Tool
Team Learning	<ul style="list-style-type: none"> Sharing Individual Learning Outcomes within Team Collecting, Analyzing, and Sharing Information within Team Group Discussion and Problem solving Producing Team Outcomes 	Discussion Board & Communication Tools Sharing & Presentation Tools Group Resource Room

	Inter-team	<ul style="list-style-type: none"> ■ Collaborating & Competing among Teams ■ Exchange & Sharing Ideas among Teams 	
Sharing & Evaluating Learning Outcomes		<ul style="list-style-type: none"> ■ Peer Evaluating & Giving Feedback on Learning Outcomes among Teams ■ Recording and Sharing Learning Outcomes ■ Evaluating & Reflecting CL Processes and Outcomes ■ Maintaining the Learning Community 	Assignment Submission function Sharing Tools Communication Tools Evaluation Checklist Survey Compensation Management Function

The result of mapping two collaborative learning models (figure 2 and table 1) is shown in table 2.

Table 2: Mapping collaborative learning model 1 and 2

Model 2 (Suh (2011))	Model 1 (Deal(Deal, 2009))
Identifying learning tasks	Project management
Team building and planning	
Team building and planning	Team definition and participants
Individual learning	Co-creation and ideation
Team learning	Consensus building
Sharing and evaluating learning outcomes	Presentation and archiving

From this table can be concluded that, although the appellation of phases in collaborative learning activities are different from different points of view, the basic and critical phases that should be followed in these activities are quite the same.

Common Collaborative Learning Tools:

In order to identify most common collaborative learning tools and phases which are most important through collaborative learning process, previous related literatures were carefully reviewed. Table 3 illustrates a summary of researches focusing on collaborative learning activities from 2007 to 2012. The findings listed in the table are categorized in five phases based on main phases of collaborative learning process discussed in model 1 and 2.

Table 3: Prior research on collaborative learning

Title	Tool	Main activities	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Pedagogical Criteria for Successful Use of Wikis as Collaborative Writing Tools in Teacher Education (Hadjerrouit, 2012)	Wikis	-Edit, modify, review writing project -Produce content, structure, and language -Discussion and communication			√		√
The Comparison of the Opinions of the University Students on the Usage of Blog and Wiki for Their Courses (Avci and Askar1, 2012)	Blog and wiki	Constructive tools(blog is used as a content discussion platform, wiki is used as a content development platform)			√		√
Effects of the Use of the Blog and Discussion Board on Online Teaching and Learning(Leh <i>et al.</i> , 2012)	Blog and Discussion Board	Supporting student learning and creating a student community					√
Wikis and academic writing: Changing the writer-reader relationship(Kuteeva, 2011)	Wikis	-Co-creation -Exchanging knowledge -Communication			√		√
Collaborative Learning Models and Support Technologies in the Future Classroom (Suh, 2011)	Presentation and communication tools (multi-touch display, PDA or smart phone, presentation tools, wiki, blog)	- Group investigation - Information exchanging & sharing - Presentation			√		
Knowledge construction and knowledge sharing: a Wiki-based approach (Begoña and Carmen, 2011)	Wikis	-Knowledge construction - Knowledge sharing			√		
The Wiki Way: Supporting	Wikis	- Online knowledge					

Collaborative Learning(Hughes, 2011b)		creation - Increasing engagement - Social constructivism			√		
EFL Learners' Use Of Blogging For Developing Writing Skills And Enhancing Attitudes Towards English Learning: An Exploratory Study (Fageeh, 2011)	Blog	-Develop writing skills -Communication			√		√
Exploiting Web Conferencing to Support Collaborative Learning(Mavridis <i>et al.</i> , 2011)	Web Conferencing	-Slide presentation -Discussion using voice and text chat tool -Develop knowledge			√	√	√
The Management and Creation of Knowledge: Do Wikis Help? (Bruen <i>et al.</i> , 2011)	Wiki	Create online communities to support knowledge management (development, retention and transfer			√		
Evaluating the use of a wiki for collaborative learning(Su and Beaumont, 2010)	Mediawiki	Construct literature reviews			√		
Wikis: what students do and do not do when writing collaboratively(Meishar-Tal and Gorsky, 2010)	Wikis	Collaborative writing actions (i.e. adding, editing and deleting information)			√		
A research on blogging as a platform to enhance language skills (Montero-Fleta and Pérez-Sabater, 2010)	Blog	-Improve writing -Improve students motivation -Knowledge retention and development			√		
Social presence, Web videoconferencing and learning in virtual teams (Giesbers <i>et al.</i> , 2009)	Web videoconferencing	Construct knowledge in collaborative groups			√		
Using Wiki technology to support student engagement: Lessons from the trenches (Cole, 2009)	Wikis	-To create a module-level knowledge repository. -To create meaningful course content suitable for assessment			√		
Toward a Semantic Forum for Active Collaborative Learning (Li <i>et al.</i> , 2009)	Semantic Forum	-Communication -Knowledge-building			√		√
The effects of using a wiki on student engagement and learning of report writing skills in a university statistics course (Neumann and Hood, 2009)	Wikis	-Information sharing -Knowledge creation			√		
Using Wikis in the Teaching of a Short Course on the History and Philosophy of Science (Holtman, 2009)	Wikis	-Knowledge sharing - Collaboration and collaborative note making			√		√
Using Wikis for Collaborative Learning: a Case Study of an Undergraduate Students' Group Project in Hong Kong. (LEUNG and CHU, 2009)	Wiki	- Knowledge building - Communication			√		√
Voice Blog: An Exploratory Study of Language Learning (Sun, 2009)	Voice blog	- Enhancement of oral-communication skills - Self-presentation - Information exchange - Social networking			√		√

Contrails of Learning: Using New Technologies for Vertical Knowledge-building (Anson and Miller-Cochran, 2009)	Wikis	-Knowledge-building - Link subsequent sections of the course into an ongoing			√		
Researching the use of Wiki's to facilitate group work (Ramanau and Geng, 2009)	Wikis	-Research grammar functions -Create learning materials - Share the resources			√		
The good, the bad and the wiki: Evaluating student-generated content for collaborative learning (Wheeler <i>et al.</i> , 2008)	Wikis	- Knowledge creation - Content creation			√		
Using a wiki to evaluate individual contribution to a collaborative learning project (Trentin, 2008)	Wikis, forum	-Spark new ideas and suggest improvements - Development of the contents -Encourage interactions -Co-planning	√		√		√
Supporting knowledge creation: using wikis for group collaboration (Watson and Harper, 2008)	Wikis	Knowledge creation			√		
The practice of web conferencing: Where are we now? (Loch and Reushle, 2008)	Web Conferencing	Improve communication Support teaching and learning			√		√
Is wiki an effective platform for group course work? (Irina Elgort <i>et al.</i> , 2008)	Wikis	-Arranging information -Sharing knowledge			√		
Supporting Deep Approaches to Learning through the Use of Wikis and Weblogs (Norm Vaughan, 2008)	Wikis and weblogs	-Wiki for co-creation - Weblogs for self-reflection and peer review - Share knowledge -Communication			√	√	√
Incorporating wikis in an educational technology course: Ideas, reflections and lessons learned (Ioannou and Artino, 2008)	Wikis	To promote collaborative learning and knowledge sharing			√		
Engagement in Online Collaborative Learning: A Case Study Using a Web 2.0 Tool (Chou and Chen, 2008)	BPWikis	-Send email notification - Develop a dynamic program using PHP programming code - Explanation of various members' roles in the project	√	√	√		√
Utilizing Wiki-Systems in higher education classes: a chance for universal access?(Ebner <i>et al.</i> , 2008)	BauWiki	Co-creation of knowledge			√		
Facilitating Cross-Cultural Learning through Collaborative Skypecasting (Chan <i>et al.</i> , 2007)	Skypecast	Engaged in collaborative learning and content creation via the Internet			√		
Collaborative Learning in a Wiki Environment: Experiences from a software engineering course (Minocha and Thomas, 2007)	Wikis	- Facilitating information sharing - Knowledge management - Fostering collaboration within and between organizations - Communication			√		√
Using wikis as a learning tool in higher education (I. Elgort, 2007)	Wikis	-Knowledge creation -Sharing of social software			√		

Constructing Text: Wiki as a Toolkit for (Collaborative?) Learning (Forte and Bruckman, 2007)	Wikis	Knowledge production and learning such as Knowledge Building.			√		
Weathering wikis: Net-based learning meets political science in a South African university (Carr <i>et al.</i> , 2007)	Wikis	-Share useful resource -Share writing across team and tutorial group -Comment on group members' work -Edit on group members' work			√		√

**phase 1: Team definition & participants, phase 2: Project management, phase 3: Co-creation & ideation, phase 4: Presentation and archiving, phase 5: Communication

Collaborative learning is considered as a process with different phases. There are varieties of available tools and technologies that may support each phase. Figure 3 shows common collaborative learning tools used for teaching and learning activities from 2007 to 2012. Figure 4 illustrates phases of collaborative learning process.

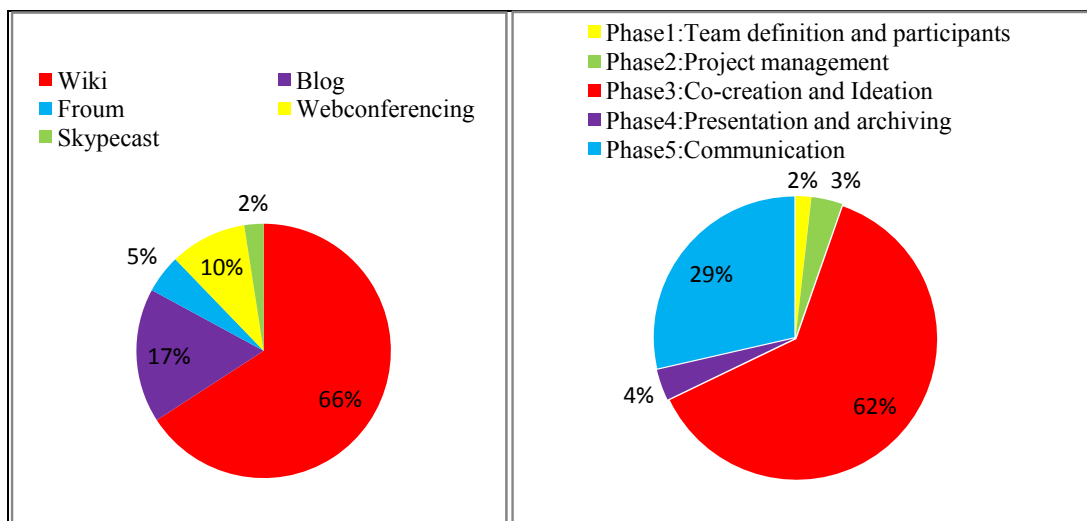


Fig. 3: Common collaborative learning tools

Fig. 4: Phases of collaborative learning process

Figure 3 shows that more than half (66%) of the researches conducted in 2007 to 2012 have focused on using wikis for collaborative learning activities. Other collaborative learning tools which are less considered by previous researchers are: blog (17%), webconferencing (10%), forum (5%).

Figure 4 illustrates that “co-creation and ideation” is the most important aspect of collaborative learning process. Most of the previous related researches (62%) have conducted in order to improve co-creation of knowledge and share information through collaborative learning activities. Supporting “communication” aspect in collaborative learning researches are also considerable (29%).

It can be concluded that in the recent researches (2007-2012) wikis are most popular collaborative tool using with the purposes of co-creating knowledge and improving communication aspects of collaborative team works. This result is consistent with Fuchs-Kittowski and Kohler (Fuchs-Kittowski and Köhler, 2002) and Raman *et al.* (Raman *et al.*, 2005) researchers who stated that “functionality of a wiki can potentially improve knowledge sharing and collaborative knowledge construction within an academic environment”. In the next part some constraints associated with this tool will be more discussed.

Constraints of Wikis as Most Common Collaborative Learning Tool:

Wikis is an open source and easy to use web page that enable members to add or edit content. It has ability to offer online space that allows students to create and share knowledge collaboratively (Hughes, 2011a). Wikis technology are able to support positive interdependence aspect of collaborative learning for on campus geographically dispersed distance students (Irina Elgort *et al.*, 2008). Since, wikis are categorised based on their usage, ownership and architecture, this technology is exposed to discussion as potential collaborative group work tool and learning resources (Ramanau and Geng, 2009). Recently, there are many researches have been conducted on using wikis as collaborative learning tool for teaching and learning. Different researchers have

pointed out different constraints of these tools through their studies. We are going to review the constraints of Wiki technology here because of the vast amount of related literature from 2007 to 2012.

Hughes (2011b) found that by using wikis students can edit and add to each others' work, though not all were happy with this feature of the wiki, some students do not like the idea of 'their work' being changed. Students argue that 'it adds more work than necessary, would be better off without it'. This result is consistent with Chou and Chen (2008) study. Furthermore, 'students tried to use wiki chat, but that was unsuccessful, so they had to use Skype instead'. Students argue that it is very challenging to use so they ended up meeting up, doing it on word then putting it on Wiki'.

Terdiman (2005) believed that Wikis are susceptible to vandalism and malware (virus) attacks, so those moderating their use must be vigilant.

Wheeler *et al.* (2008) claimed that user generated nature of the wiki causing no guarantees for accuracy and veracity on it. The wiki activities do not suit the learning preferences of all students. Results of this study show that Students need more time to be familiarized with the environment and architecture of wikis. The wiki is too unstructured and that although some students enjoyed working on it, they required some limitations in order to make sense of their learning. Wiki may limit individual contributions, and students may read very little of the content created by their peers. The limited capacity of the free wiki software also had an effect on multiple user editing. When students attempted to add to shared pages there was occasional conflict, and the software was unable to cope with the simultaneous posting. Students should understand that once the 'send' button has been pressed, the idea no longer belongs exclusively to the originator, but now becomes the property of the whole learning community. Assessment is difficult and should be based on student contributions and written assignments. The problem of equitable marking of individual work would also require further thought, given the shared and public nature of the wiki. Problems of ownership and intellectual property and the exclusion of a spell check are also considerable.

Minocha and Thomas (2007) specified some technical obstacles of wikis as below:

1. The editing window in the wiki was small and did not provide enough context and content for the document being edited. Students had to scroll the content up and down while they were entering text in the wiki via this editing window.

2. The wiki navigation was poor because the user always has to return to the root page before reviewing another branch.

3. Users had to check the wiki on a regular basis to see whether there had been any contributions from other group members

4. The absence of a locking mechanism on the wiki to avoid the problems of concurrent updates.

They also claimed that Wiki needs to be supported with some form of synchronous discussion medium to facilitate timely decision-making. Agreeing specific time that all participants can collectively engage with the discussions is another constraint of wikis.

Hadjerrouit (2012) conducted a study on collaborative learning by using MediaWiki. The results of this study show that MediaWiki did not substantially support collaboration, or even hindered collaboration. Multiple-editing is difficult due to limited capacity of MediaWiki. Therefore, simultaneous writing is not as easy as other Web 2.0 technologies such as Google Docs. Most of the activities are done by one or two students in a group. Therefore, collaboration does not really improve. Discussion page does not identify the contributor, time, and separate discussions about topics so that a great deal of time is needed to search before a thread of a discussion can be followed. Moreover, discussion page cannot keep a sense of order to different discussions. Discussion page of MediaWiki is not comfortable enough to support group discussions. In this study, Some technical problems of wikis such as unstable server, lack of features and extensions, insufficient multimedia support, placing of images, and concurrent editing are also considered and concluded that these problems sometimes cause low motivation among students.

Ramanau and Geng (Ramanau and Geng, 2009) conducted a study at one of the universities in the UK to evaluate the learner experiences of using wikis. They listed constraints of wikis as: creating and editing Wiki pages; uncertainty about the nature of learning activities; technical difficulties; difficulties with managing their and other students' time; unorganized structure; difficulties with the structure of learning space; need for more proactive interaction in groups; perceived benefits of learning through the Wiki and issues of group leadership. Moreover, they found that some discussion pages needed to be included in the wikis to foster communication within team members.

Results of a study run by Begoña and Carmen (Begoña and Carmen, 2011) with Spanish students in a university degree reported technical problems of wikis pages as main important constraints.

Elgort (I. Elgort, 2007) believed that absence of a formal structure and appropriate navigational support are two main constraints of using wikis in university contexts.

Elgort *et al.* (Irina Elgort *et al.*, 2008) found that weak predefined structure, limited formatting opportunities in wiki pages, little security and privacy, limited formatting features as common constraints of wikis. Additionally, they believe that wikis are not very effective communication tools.

The results of students evaluation in a study conducted in a first year university statistics class listed constraints of wiki as: problem of work group (e.g poor contribution of some members in group), technology difficulties (e.g., putting figure is difficult, using wiki is challenging), and time issues, and learning problems (Neumann and Hood, 2009).

Difficult structure to navigate, difficult to relocate information, "wild wiki" (wikis' growing number of new pages) problems are reported by (Watson and Harper, 2008).

An empirical research undertaken at Liverpool Hope University reported providing easy access to the wiki, lack of personalisation, possible vandalism and plagiarism as main issues of wikis. They also believe that extra help and time should be considered for students with learning difficulties to make them familiar with this environment (Su and Beaumont, 2010).

Lack of usability, lack of motivation, complicated handling, improper search functions, trust in the content are some other problems regarding use of wikis in higher education (Ebner *et al.*, 2008).

Cole (Cole, 2009) Concluded unknown location, confused, time constraints, lack of interest, hesitant as constraints of using wikis.

Group communication and motivation issues, Technical issues, Learning curve involved in using a wiki, Workload involved in using a wiki, Public nature of comments, Restrictive are highlighted by (N. Vaughan, 2008) as problems of wikis.

Discussion and Conclusion:

Recently, there is a trend of new generation of learners towards using technology and internet as key success factors for teaching and learning processes. Furthermore, these generation significantly gravitated towards collaborative learning activities rather than doing individually. Therefore, increasing number of studies have been conducted regarding collaborative learning tools and processes. Findings from this study suggest that wikis are the popular collaborative learning tools which are most considered by researchers in 2007 to 2012. Wikis have recently appeared as powerful collaborative tools for supporting students activities. However, a significant numbers of previous related studies (from 2007 to 2012) conducted on knowledge creation and ideation, as well as, communication by utilizing wikis as collaborative learning tools. It simply means that knowledge creation and ideation, which are the formation of new idea and knowledge through interactions between human minds, is the most important part of collaborative learning process. Ashlaghi *et al.* (Ashlaghi *et al.*, 2013) believed that recently acquiring, creating, and disseminating knowledge is considered as new paradigm and key success factor to survive societies. Moreover, the importance of communication is also highly considerable in this process.

Even though using wikis as collaboration tool have potential advantages for students and lecturers, emphasizing on the disadvantages of this technology is also worthwhile. In this study we reviewed the users' views on using wikis for group course work. Unsuccessful use of wikis for chat and discussion, limited multiple user editing, technical problems, too unstructured platform, lack of motivation, privacy and security issues are most common constraints of using wikis from user's points of view.

In summary, young generations are growing up with new preferences and behavioral intentions. Therefore, basic changes should be applied in the curriculum and methods of teaching and learning for them. With many of the constraints regarding previous collaborative learning tools and emerging new web technologies such as cloud computing, it is expected that wikis will be replaced by cloud-base applications in order to outweigh benefits rather than limitations and empower group project activities.

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