Collaborative Learning in the Workplace: Practical Issues and Concerns

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Abstract—**This study aims to identify practical issues and concerns about collaborative learning in the workplace. For this purpose, the study examines perceptions of corporate personnel including learning managers and instructional designers related to workplace collaboration and associated technology tools that might foster or enhance it. First, we identify future research interests and concerns related to collaboration and collaborative tools as revealed from an online survey of 97 respondents. Second, we verify the primary collaboration issues and concerns in corporations through an open discussion forum in which 30 corporate personnel participated. Findings indicate that the use of collaborative tools is growing in importance in the workplace as is collaboration in general. Further, participants in the survey appear highly interested in wikis as collaborative tools. In addition, group discussions reveal five main collaboration concerns in corporations including factors to consider when selecting and using collaborative tools. Based on those findings, significant implications for future research on workplace collaborative learning are offered.**

Index Terms—**collaborative learning, collaboration, collaborative tools, wikis, and workplace learning.**

I. INTRODUCTION

Learning and training activities in the workplace have pursued the goal of improving not only individual competence and productivity but organizational performance as well [26]. As organizations increasingly focus on the importance of learning performance, they realize that it is no longer sufficient to provide their employees with traditional training programs such as instructor-led classroom instruction or self-paced e-learning. Since adult learners can be motivated once learning meets their practical needs on the job [16], they prefer to learn through collaborating with other people who have more hands-on experiences at work rather learn than from classroom instructors. The enhancement of requisite knowledge and skills requires insights from colleagues and mentors who have relevant prior experiences and backgrounds to solve unique problems and overcome different learning-related challenges. Summaries of the research literature indicate that collaborative learning can foster deeper level learning as well as critical thinking through sharing others' ideas and experiences [14].

Collaborative learning refers to instructional methods that encourage learners to work together on academic tasks. It fundamentally differs from the traditional direct transfer or one-way knowledge transmission by instructors [10]. In collaborative learning, instruction shifts from an instructor-centered to a more learner-centered paradigm since knowledge is considered as a social construct which is facilitated by peer interaction, evaluation, and cooperation [12].

The advent and application of Web 2.0 technologies also have been accelerating learner-centered personalized learning environments [28]. According to O'Reilly (2005), the Web 2.0 is characterized by Web applications such as wikis, blogs, Twitter, and Facebook and referred to as the second generation of Web-based services. Such tools have been increasingly used both in schools and workplaces. As a result, experimentation with Web-based collaborative learning technologies is spreading fast. This environment has enabled learner-led collaborative learning, which allows instructors to adopt a more supportive role [11]. As this occurs, new contents are created and used in partnership with others [7]. In effect, knowledge is constructed and shared, instead of just passed down from authorities and passively consumed or, worse still, simply ignored.

As collaborative processes and activities as well as the technological tools for enhancing teamwork have become increasingly critical to workplace success, learning managers and instructional designers have been faced with a series of pressing issues. For instance, there is a growing need to understand actual interests and concerns regarding collaboration processes, activities, and tools. Training managers and corporate leaders must better understand the collaborative tools and processes that can boost productivity. In effect, they must become better equipped to design, implement, and evaluate collaborative learning environments. In this context, it is crucial to examine the perceptions of corporate personnel on the use of collaborative tools within company operations and training as well as current issues of collaboration. Although those promoting collaboration processes and associated tools for the workplace have emphasized the potential for building knowledge resources and developing collaborative capabilities, there is little research investigating the actual interests and concerns in these areas in corporate settings. In response, this study identifies the practical issues and concerns regarding collaborative learning in the workplace by exploring the perceptions of people who have been working at organizations that utilize collaboration processes and tools.

II. LITERATURE REVIEW

A. Collaborative Learning in the Workplace

Collaboration can be defined as a process that "occurs when a group of autonomous stakeholders of a problem

domain engage in an interactive process, using shared rules, norms, and structures, to act or decide on issues related to that domain" [34]. More recently, collaboration emphasizes that it entails such activities as sharing information with others, jointly crafting strategic planning documents, and using forms of vertical integration to find effective ways to synchronize business operations with vendors without being forced to acquire additional businesses [29]. In collaboration, it is crucial to consider the interactive processes among people, but collaboration is more than the interactions between participants and the knowledge each brings to the collaborative setting. The key aspect of collaboration is the construction of new knowledge brought about through joint work. This generation of new knowledge is enhanced when members bring complementary domains of expertise to the planning and decision making process [21].

Some researchers and theorists have shown that collaborative learning fosters different aspects of critical thinking [9][32][33]. According to Gokhale (1995), learners who participated in collaborative learning performed significantly better on a critical-thinking test than learners who studied individually. The active exchange of ideas within groups not only increases interest among the participants but also improves critical thinking. In addition, learners in collaborative learning environments achieve at higher levels of thinking and retain information longer than learners who work as individuals [14]. Moreover, collaborative learning provides a cost effective method of training since collaboration reinforces the knowledge of both the helpers and the persons being helped [6][23].

In spite of these positive effects of collaborative learning, there are many challenges and open issues related to it in the workplace. Based on several studies of collaboration in the workplace, the challenges of collaboration can be summarized as follows: (1) cultural diversity and, accordingly, a lack of awareness of cultural norms; (2) geographical distance and time zone differences; (3) member isolation in virtual teams; (4) generation gaps and age differences in the acceptance of collaboration tools; (5) lack of technology support for learners; (6) lack of learners' awareness about effective collaboration processes and strategies; and (7) lack of learners' technological skills and knowledge about collaboration tools [13]18]. In terms of cultural diversity, it may be difficult for employees in different countries or overseas branches to understand the diverse culture expectations and experiences of each other when they collaborate. Furthermore, it may be a critical challenge to implement collaboration efficiently and effectively if corporations do not provide their employees with sufficient technologies for collaboration. In addition, even if companies provide appropriate technologies for collaboration, effective collaborative learning may be difficult to implement if learners do not perceive the importance of collaboration and do not have sufficient skills and knowledge for using collaboration tools and engaging in online team activities.

B. Collaborative Tools in the Workplace

Companies in the past have used technologies such as discussion threads, email, or electronic bulletin boards [4] for sharing personal knowledge and ideas. However, personal knowledge contributions through those discussion-based technologies have often been limited to individual contributions without others being able to refine or add to such information. In other words, while one member posts a useful summary or a unique idea on those discussion boards, they cannot be edited or integrated by others [35]. Therefore, such traditional organizational repositories have not satisfied the demand for efficiently and effectively leveraging the knowledge in a firm or even among a small global team [1][24]. In contrast, collaborative tools in Web 2.0 environments can be highly valuable to solve such limitations of traditional corporate communication tools and group interactions.

As Web technologies have increasingly offered innovative ways to enhance collaborative learning, the use of collaboration tools for learning and interacting in the workplace has proliferated [36]. Recent technology advances in the organizational infrastructure emphasize efficient collaboration using Web 2.0 tools that foster a participatory environment where members generate, discuss, and evaluate evolving ideas. Since workers need to be able to think creatively, solve problems, and make decisions as a team [9], such tools can help learners collaborate more efficiently and effectively. Furthermore, collaborative tools not only help learners express themselves better, find like-minded communities, and make the Web a platform for work, but also enable people, teams, and communities to work together and build innovation through collaboration. Clearly, there are many benefits and expectations for collaborative technologies in workplace settings.

In Web 2.0 environments, employees of the highly successful companies in the twenty-first century can create valuable information and knowledge online and communicate electronically by using various collaboration tools such as wikis, blogs, Facebook, and Twitter. As pointed out by Tapscott and Williams (2008), these tools are assisting individual workers to communicate and collaborate more productively. They further note that among group collaboration tools, "wikis conform naturally to the way people think and work, and have the flexibility to evolve in a self-organizing fashion as the needs and capabilities of the organization change" [30].

C. Wikis as a Collaborative Tool in the Workplace

As one of representative Web 2.0 technologies, wikis can be used to support collaborative activities in knowledge management by providing, sharing, and creating knowledge not only in educational environments [31], but in business as well. When effectively deployed, wikis can support an organization's collaboration and knowledge management requirements [25]. Stated another way, the impact of wiki technology is quite broad in terms of supporting collaborative knowledge creation from academic environments to those in the corporate world [25]. Furthermore, wiki technology can be a significant innovation in managing knowledge within society because it is designed for quick knowledge construction and collaboration for either a private or a world audience [2][3].

The interests in and needs for wikis are spreading fast because they allow users to create and edit Web pages easily and rapidly. Even though wikis are not the first technology for collaboration, they are often the tool of choice because of their simplicity and ease of successful application or implementation. The attractive characteristics of wikis can be summarized by the following five features or characteristics: (1) rapidness; (2) simplicity; (3) convenience; (4) open source; and (5) maintainability.

Wiki pages are not only rapidly and conveniently constructed, accessed, and modified by each member, but are also maintained as a type of database, which records its historical revision and content [27]. Wiki formats are often quite simple and require only a username and password to access and change. The use of wikis serves as both a means of communicating ideas and a resource for sharing, storing, and retrieving knowledge among its members [15].

Wikis can be used not only as an instructional strategy to promote collaborative learning in schools but as a communication tool for effective work activities by supporting collaboration in a corporate, military, or government setting. In corporate environments, it is extremely important to reduce time-consuming and inefficient work activities in order to increase employee productivity. To deal with such issues, wiki types of technology innovation can be valuable for saving time and money in corporate environments and other types of work settings. Wiki technology in the corporate world can be applied in various fields such as software development, e-learning, project management, communities of practice, ad hoc collaboration, technical support, marketing and customer relationships management, resource management, and research and development [31]. In particular, wikis are identified as an up-and-coming technology to support collaboration within and between firms [20].

There are many prominent examples of using wikis in the workplace. For example, wikis were introduced to Motorola as one of several important pieces of its collaboration infrastructure. Motorola also employed instant messaging (12 million per day) and blogs (2,600 corporate-wide) for employee interaction and collaboration. In addition, engineers at Motorola have used TWiki enterprise collaboration software, which is better suited to engineering applications [8]. Second, two European companies, Finnish handset-maker Nokia and London- and Frankfurt-based investment bank Dresdner Kleinwort, are finding ways to encourage their employees to use wikis as collaboration tools. Such activities might include editing documents, sharing ideas, or monitoring the status of a project. The functions of wikis are not limited to collaborative attempts to solve specific product-design problems but to explore alternatives to e-mail and expensive or difficult to use collaborative software. In particular, Nokia estimates at least 20% of its 68,000 employees use wiki pages to update the status of projects, exchange ideas, edit files, and so on. So successful are wikis in the corporate world that many like Dresdner Kleinwort have launched their own corporate wiki. In fact, by October, 2006, Dresdner Kleinwort 5,000 bank employees had created more than 6,000 individual pages and logged 100,000 hits on the company's official wiki [5]. Accordingly, the cases of Nokia and Dresdner Kleinwort show how the use of a radically new technology such as a wiki can quickly change the way organizations work. Third, Intel's corporate wiki, Intelpedia, developed by using MediaWiki, provides all the features and functionality that Wikipedia has on their own internal wiki [17]. Fourth, Carbon Five, a small company that develops enterprise web application for clients, uses wikis to collaborate on projects with their clients. Fifth, the wildly successful film producer company, Pixar, employs wikis internally to manage film production [19]. Along these same lines, some companies, such as IBM, SAP, and Sony Ericsson, use wikis as part of their developer networks. As an example, IBM DeveloperWorks Wikis includes topics such as Lotus Quickr Best Practices, WebSphere Instructor Wiki, and a series of "Web 2.0 Goes to Work" conferences. Given those examples, it is assumed that wikis can be used not only internally for employees' tasks but also externally for support clients' services.

III. METHODOLOGY

A. Paricipants

The participants in the study were corporate personnel including learning mangers and instructional designers in various organizations. They were divided into two different groups, which were a survey group and a discussion group.

In the survey, a total of 97 corporate people participated. The respondents represented a range of corporate and government organizations mainly located in North America. In addition, some learning managers from across the globe--such as Canada, Australia, Japan, Saudi Arabia, Switzerland, and Sweden--also participated in the survey.

Additional data related to key collaboration issues in corporations were collected from group discussions. Participants of this group discussion were training and learning professionals such as learning mangers and instructional designers working in a range of corporate and governmental organizations. There were 30 people in the discussion session. They constituted five focus groups for small group discussion. These individuals were not the same people who participated in the previously referenced survey of research interests and concerns.

B. Instrumentation

To examine areas of interests and concerns related to collaborative processes and associated Web-based collaborative tools among corporate learning managers and instructional designers, an online survey was conducted over the period of two weeks in August 2010. In order to gain access to this group, their organizational identities were kept confidential. These survey questions were open-ended.

In addition, the sticky-note pieces of paper were used in each group for small group discussions which were in a special session during a national conference focused on learning technologies in October 2010.

C. Data Analysis

In the survey, three main questions were targeted, namely, (1) research questions for future research on collaboration and collaboration tools in the workplace; (2) collaboration tools that would be of interest for further study; and (3) other concerns regarding collaborative processes and tools in the workplace. The answers of the participants about the three questions were analyzed and constituted two categories.

Discussion topics included the following five collaboration issues: (1) factors considered when selecting and using collaboration tools; (2) factors promoting collaboration within and between organizations in the workplace; (3) implementation of collaborative processes and tools; (4) measuring the effectiveness of collaboration and associated tools; and (5) future research of collaboration in the workplace. Before starting the group discussion, individu-

al participants were given 10 minutes to respond to these five issues using sticky-note pieces of paper. Next, the 30 participants formed five groups consisting of six members each. These five groups discussed one of the topic questions or issues assigned to their group. They were given 20 minutes to discuss the question more fully based on their individual response to the question. After the group discussion, each group shared their discussion results with the other groups for approximately 20 minutes. Finally, near the end of the session, ten minutes was allocated for debriefing and question and answers across the entire group. The discussion session was conducted in an hour. The results of the discussions were summarized by the results of each group discussion.

IV. RESULTS

A. A survey on research interests and concerns in collaboration and its tools

Regarding the first question related to areas of future research on collaboration in the workplace, two main topics such as collaboration and collaboration tools were identified. These topics were extracted from the survey responses and are summarized in the Table 1.

The first topic, collaboration, included a series of interesting research questions related to collaboration methods, factors affecting collaboration, and measurement of collaboration effectiveness in the workplace. Regarding collaboration methods, many participants were interested in how collaboration contributes to workplace efficiency and how collaboration facilitates knowledge and skills development. The collaboration topic related to factors affecting collaboration also had several possible research questions, such as what factors contribute to creating and sustaining a collaborative culture and what factors contribute to maximize collaboration within and between organizations in the workplace.

The second topic of collaboration tools was divided by six detailed issues such as (1) types, (2) functionality, (3) utility, (4) benefit, (5) implementation, and (6) measurement of effectiveness of collaboration tools. Each of these issues contained two or more research questions deemed vital to workplace learning. For example, the topic related to the implementation of collaboration tools included four future research questions, i.e., "What are some success stories related to the implementation of collaborative technology for learning?," "What is the basic way of implementing collaborative tools in organizations?," "What functional areas of organizations have seen the greatest performance improvement as a result of implementing collaborative tools?," and "It's challenging to find the right collaborative tools to create shared resources. Each tool requires time, effort, and organization to implement into work practices. How do we resolve the issue of too many tools, not enough time?"

TABLE I.
SUMMARY OF THE FIRST SURVEY RESPONSES: FUTURE RESEARCH QUESTIONS ON COLLABORATION AND COLLABORATIVE TOOLS

Topics		Future research questions
Collaboration	Methods	• How does collaboration contribute to workplace efficiency? • How does collaboration facilitate knowledge and skills development? • How do you build the trust that creates the foundation for collaboration? (In particular, in virtual collaboration) • How do remote team members collaborate?
	Factors affecting collaboration	• What factors contribute to creating and sustaining a collaborative culture in the workplace? • What factors contribute to maximize collaboration within and between organizations in the workplace? • What policies, procedures, tools, and competencies facilitate productive collaboration in a work environment? • What are the factors that motivate collaboration--both within a workplace and within an electronic environment?
	Effectiveness measurement	• How can we measure the effectiveness of collaboration? • How do you determine the business ROI of (online) collaboration? • How do we measure performance and the effect of collaboration on corporate culture?
Collaborative tools	Types	• What collaboration tools are you currently using in the workplace? • How or why did you choose these tools?
	Functionality	• What is the core functionality of collaborative tools? • What functionality needs further improvement and refinement to make it easier for communities of practitioners to collaborate?
	Utility	• How to utilize the tools to improve collaboration? • How to deal with teams where people are physically in different locations?
	Benefit	• Does the use of collaboration tools enhance learning acquisition and retention? • How does their use impact employee productivity?
	Implementation	• What are some success stories related to the implementation of collaborative technology for learning? • What is the basic way of implementing collaborative tools in organizations? • What functional areas of organizations have seen the greatest performance improvement as a result of implementing collaborative tools? • It's challenging to find the right collaborative tools to create shared resources. Each tool requires time, effort, and organization to implement into work practices. How do we resolve the issue of too many tools, not enough time?
	Effectiveness measurement	• How do you translate the use of collaboration tools into improved performance? • How do you measure business impact/success/effectiveness of collaborative tools?

Regarding the second question, "Which collaboration tools would be of interest for further study?," the results signaled that the participants were interested in various collaboration tools such as social networking tools, virtual work (or meeting) software, and virtual learning technology. Social networking tools included Web meeting tools and professional networking such as wikis, blogs, Facebook, MS Sharepoint, Twitter, Yammer, YouTube, LinkedIn, and Ning. In addition, virtual work software included Second Life, VenGen, ActiveWorlds, and Proto-Share 2.0. Other tools, such as instant messaging, discussion boards, podcasting, mobile learning tools, video conferencing, Skype, and Flickr, were mentioned. Clearly, the respondents were experimenting with, or at least aware of, a range of technology tools for collaboration in various workplace environments.

Through the open ended survey items, participants were able to comment on several forms of online collaboration and associated collaborative tools. Thus, the survey results presented a broad perspective of practical issues and concerns. For instance, 40 of the 97 respondents were keenly aware and interested in wikis as a collaboration tool for their companies. One person stated "I am most interested to see examples of how wikis are used in companies to assist with learning." Another person noted "I am most interested in wikis and how organizations control content and accuracy." As the survey results indicate, the preference for wikis as a collaborative tool option was superior to all other options including the use of social media like LinkedIn and Twitter. Figure 1 displays the research interest of the study participants related to collaboration tools in corporate settings.

Regarding the third question, "What are some other concerns regarding collaboration in the workplace?," the five concerns can be classified as follows: (1) a component of blended learning, (2) a relationship with other learning strategies, (3) contribution, (4) generation, and (5) characteristics of individuals (see Table II).

According to the survey results, learning managers and instructional designers in the workplace are mainly concerned with how organizations implement collaboration successfully and how organizations facilitate their employees' use of collaboration tools effectively for their collaborative learning environments. At the same time, the managers and designers taking part in this study also realized these collaborative strategies and tool efficiencies may vary based on prior experiences of an individual or an entire generation. They were also aware that established organizational practices as well as surrounding culture have a huge influence on how, when, and where collaboration occurs. Management acceptance and embrace of collaboration as key to successful operations also plays a vital role in awareness, implementation, and pervading attitudes of employees related to workplace collaboration. Overall, however, the chief focus of the study participants was on efficiency and productivity issues, not on issues like social rapport, emotional connectedness, or community building.

B. Group discussions about main issues of collaboration and its tools

During the group discussion, it was revealed that accessibility, ease of use, and security were critical factors when selecting and using collaboration tools. Participants also mentioned the critical nature of the value placed on
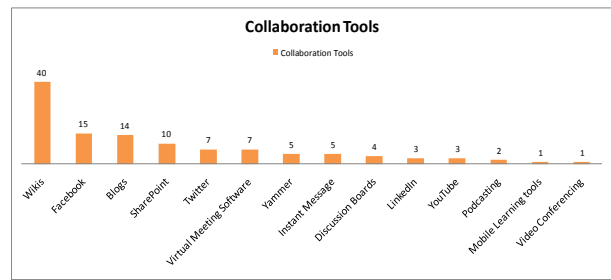

Figure 1. Summary of the second survey responses: Preferred collaboration tools in the workplace for future research

TABLE II.
SUMMARY OF THE THIRD SURVEY RESPONSES: SOME CONCERNS REGARDING COLLABORATION IN THE WORKPLACE

Category	Concerns
A component of blended learning	• How does social network technology integrate as a component of blended learning (including virtual classroom and live classroom application)?
A relationship with other learning strategies	• How does collaboration tie in with other strategies such as an organization's KM/content management as well as its' learning strategies?
Contribution	• It is said that people like to look at what others write, but many don't actually contribute. Is this really the case? If so, how does one overcome that?
Generation	• How do different generations of employees collaborate most effectively? How do groups of same or mixed groups of different generations collaborate?
Characteristics of individuals	• What types of people collaborate? Are they from different departments or geographical locations within a corporation? Are they individuals from different companies? Why do they collaborate?

collaboration within the workplace; if management support was lacking, then it was unlikely to be valued. In addition, they discussed the utility of the information gained from collaboration as a key factor that promoted collaboration within and between organizations.

Regarding the implementation of collaboration and collaborative tools, some felt that companies could use collaboration tools in their LMS. In effect, collaboration tools could be connected to learning management systems without separately implementing collaboration tools and LMSs. In addition, many argued that it would be helpful to create guidelines on how to use collaborative tools as well as provide training for understanding collaboration and using collaboration tools. Next, there were several opinions about measuring the effectiveness of collaboration activities and associated Web technologies. In order to measure the effectiveness of collaboration and collaboration tools, companies could analyze data from the following sources: (1) users' ratings and feedback; (2) access frequency; and (3) user participation. Finally, the participants felt that future research on collaboration in the workplace was needed to focus on investigating the maintenance or increase of interest in collaboration tools. They also suggested that researchers might explore the positive and negative psychological effects of such increases in collaboration and collaborative tool use. Table III summarizes much of this discussion.

TABLE III.
GROUP DISCUSSIONS ABOUT COLLABORATION AND COLLABORATIVE TOOLS IN THE WORKPLACE

No	Topics	Results
1	What are some factors to consider when selecting and using collaborative tools?	• Ease of use—easy to add comments • Security—access for external/internal • Available methods of access
2	What factors promote collaboration within and between organizations in the workplace?	• Influencing organizational culture • Accessibility • Value of the information—exciting, high value
3	How would you implement collaboration and collaborative tools?	• LMS platform as a way to do it • Something of interest—pick high interest issue • Leadership buy in and role modeling • Designing or finding the right tool, creating guidelines on how to use, providing training on how to do it
4	How would you measure the effectiveness of collaboration and collaborative tools?	• The frequency of access • User ratings and other feedback • The impact • Loop back feedback to improve usage • Alignment to potential business impact • Problem solving with others across the country: accurate resolutions can measure success • Not just numbers but patterns or themes • Authors vs. users, repeat visitors, unique visitors • Survey Users vs. Non-Users • Site hits • Volume of discussion • Number of additions to the Wiki
5	What would you like to see researched regarding collaboration in the workplace?	• Getting metrics on getting questions answered via email distribution vs. discussion boards • Best in class companies for benchmarking • How to maintain interest level in wikis (spike in interest, then falls off… how to keep it going) • Community "gardeners" to cultivate and keep fresh • Psychological effect of collaboration: positive/benefits, negative/costs

V. CONCLUSION

Many organizations are actively pursuing and promoting collaborative learning for high-performance at work. Given the significant rise in collaboration in corporate settings, it is crucial to identify the major research interests and issues related to such collaboration through perspectives of those engaged in such efforts. As such, this study focused on research that might be conducted on both the collaboration processes as well as the associated collaboration tools impacting the workplace today for effective collaborative learning environments.

According to the survey results, the main research questions that seem to be critical are in the areas of collaboration and collaboration tools. In terms of the topic of collaboration, most participants were interested in how collaboration facilitates knowledge and skills development and contribution in the workplace. Such findings indicate that corporations are seeking methods to effectively implement collaborative learning. In effect, if the key factors affecting collaboration can be identified by research, it can reveal what factors are critical for collaboration. It is our hope that companies can use information about those factors to implement collaborative practices more effectively for learning. In addition, the implementation and effective measurement of collaborative processes and tools also can be researched through case studies of best practices. It is hoped that the results of future research may reveal more specifics as to when, where, and how to implement different forms of collaboration and types of collaborative tools in the workplace.

A key finding of this particular study regarding the topic of collaboration tools was that wikis had the highest research interest as a collaboration tool when compared to several other options. In our survey, most participants responded with more than one collaboration tool as potentially impactful; however, they frequently mentioned wikis as the most interesting tool for collaboration research. The survey result also revealed keen interest in wikis in corporations. Many wiki users, in fact, indicate that the benefits are linked to the ease and efficiency with which collaboration takes place [30].

As noted in the review of the literature on wikis in corporate contexts, companies have been using wikis in many ways to enhance their production efficiencies and knowledge management. The power of wiki technology comes, in part, from the simple collaborative editing function which allows users to share their ideas and collaborate seamlessly across time and space. However, despite the advancement of Web technology, most users are accustomed to "read-only" Web-based systems where they cannot contribute their thoughts and ideas. Consequently, sufficient time and training is required in order to fully utilize wiki technology in workplace settings [25].

There were several concerns regarding collaboration in the workplace. These concerns included looking at collaboration as a component of blended learning. Understanding how collaboration can enhance or perhaps ever transform blended learning experiences and learning results as well as how to measure such benefits is of increasing concern. Another issue was its relationship with other learning strategies such individual exploration or refection.

Other study participants were interested in research on participant contributions in collaborative situations. Finally, some wanted to know more about characteristics of individuals who performed well in collaborative situations as well as the traits of those who did not. Similarly, some were interested in generational differences in exposure to collaboration strategies and activities. What was clear from these discussions was that instructional designers in corporate settings can incorporate collaboration tools into various learning environments to design a type of blended learning. In addition, collaborative processes and tools can be combined with learning strategies such as knowledge management and learning management systems.

Although there are many possibilities to implement collaborative processes and associated technologies, some participants were concerned that most people do not contribute but merely look at others' work in collaborative contexts. Thus, it is vital to find appropriate ways to overcome this kind of challenge in collaboration. Furthermore, participant concerns about generational differences and characteristics of individuals imply that corporations need to consider generation gaps between senior and junior workers and also individual learners' characteristics such as active or passive learning expectations and backgrounds of those engaging in collaborative learning activities.

According to the results of the group discussions, collaboration issues in corporations could be condensed into these five main issues: (1) factors considered when selecting and using collaboration tools; (2) factors promoting collaboration within and between organizations in the workplace; (3) implementation of collaboration and its tools; (4) measuring the effectiveness of collaboration and its tools; and (5) future research on collaboration in the workplace. Through group discussion, more detailed perceptions of people in the corporate world regarding collaboration and collaboration tools were investigated. Although most companies in the group discussion remained in the experimental stage in terms of using collaboration tools, the participants presented diverse opinions in each discussion topic. Importantly, the group discussion lent insights into several of the key areas of interest mentioned in the survey.

In conclusion, this study shed light on the significance not only of future research related to collaboration processes and tools but how certain tools like wikis are already being employed in the workplace. As such, it provides some initial indicators of the main collaboration issues that should be addressed in future research regarding collaborative processes and tools in the workplace. Since the results of this study came mostly from the perspectives of learning managers and instructional designers in various organizations from around the world, they will provide practical insights into collaboration and its tools in the workplace. The coming decade should prove highly interesting for those collaborating with emerging technologies in the workplace as well as those studying it.

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