Collaborative Web-based Teacher Professional Development system: A new direction for Teacher Professional Development in Malaysia

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Abstract

A collaborative web based system enables people from distributed places to work collaboratively and share information with the help of computers and network technologies. With the advance in computer technology, the use of web based instructional systems to enhance and enliven the process of teaching and learning has gained momentum in educational community. A teacher professional development system is an online learning system which provides a platform for the in-service teachers to join training, share resources and build a collaborative learning community. This paper proposes a Collaborative Web-based Teacher Professional Development System to enhance the professional development of teachers in Malaysia. It also evaluates the current situation of teacher professional development in Malaysia; describe the need for such a system in Malaysia and overview existing professional development systems.

Introduction

A Collaborative Web-based system (CWS) integrates computer technology and collaborative work and learning to enhance and enliven the process of working and learning (Kumar, 1996; Wilson, 1991; Grief, 1988). It enables people from distributed places to work collaboratively and share information to improve communication skills and global awareness (Tinio, 2002). Participants from different background share information, solve problems and help each other to gain knowledge. These systems make use of technology to control and monitor the interaction between the participants during collaborative sessions (Kumar, 1996). CWS benefits its users by aiding in easy distribution information, improving process quality, reducing risks, and saving time and cost of the work (Sun & Oza, 2010). In a very broad sense, Professional development (PD) refers to the overall development of a person with regard to the person's professional role (Villegs-Reimers, 2003). Teacher professional Development (TPD) is the professional growth of a teacher as a result of gaining increased experience and examining his or her teaching system (Glatthorn, 1995). It includes the formal and informal experiences that a teacher goes through during the career of teaching (Ganser, 2000). Teacher professional development is a means to improve classroom instruction, enhance student achievement and increase teacher quality (Holand, 2005).

Improving the quality of teachers was one of the main targets highlighted by Dato' Sri Mohd. Najib Bin Tun Abdul Razak in tenth Malaysian plan 2011 -2015 (Najib, 2010). Teachers are a valuable resource that a nation can count upon to mould and nurture its young children. The quality of teacher is directly related to school improvement and the quality of education provided (Hanushek & Rivkin, 2006). Professional development is the main way to continue education and the best way to upgrade the teachers and keep them up to date with the changes in curriculum, incorporation of new technologies and new teaching methods and resources.

A collaborative web-based teacher professional development system aims to achieve these objectives. The purpose of such a system is to provide a platform where the teachers can be trained and provided necessary guidance and resources. At the same time such a system would enable teachers from different parts of Malaysia to share their ideas and work with teachers from different background and experience. They can also share the lessons and teaching experiences to aid in professional development. The teaching and learning materials developed by the teachers can be shared online so that the quality of teaching in all the parts of the country will be maintained at the same level. Since the curriculum of Malaysia is centralised, the changes brought to the curriculum can be easily conveyed and the ideas of the teachers can be directly given to the curriculum development centre through such a system.

The aim of this paper is to propose a Collaborative web-based teacher professional development system to enhance the professional development of Malaysian teachers. It also evaluates the current situation of teacher professional development in Malaysia; describe the need for such a system in Malaysia, overview existing professional development systems, suggest a framework for such a system and describe its benefits.

Background/ Problem analysis

Teacher professional development sector (TPDS) was inaugurated by former prime minister of Malaysia, Dato' Seri Abdullah Ahmad Badawi in 2008. This sector manages and implements teacher professional development activities throughout the nation with the purpose of providing and achieving quality education. The role of this sector was further enhanced by placing the Teacher Education Division (TED), Aminuddin Baki Institue (IAB), the School Inspectorate and Quality Assurance division and Malaysian Institute of Teacher Education under its preview and responsibility (see figure 1) (School Malaysia, 2010).

The establishment of TPDS has brought a rather a noticeable change in Professional development of Malaysian teachers. Based on Teaching and Learning International Survey (TALIS), 2009 results, 92% of teachers engage in professional development activities during 18 months of survey period. This is a relatively high percentage compared to TALIS average of 89% (OECD, 2009). In an effort to harness technology into education system, teachers were issued laptops which have a moderate and positive impact on overall teachers' professional development (Wong et al, 2010).

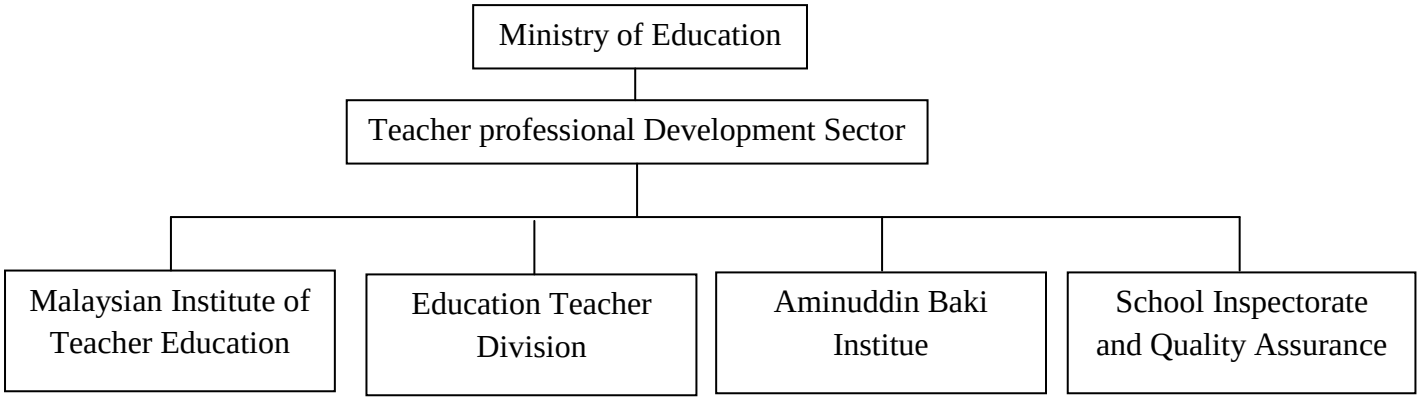

Figure 1: Teacher Professional Development Organisation structure (School Malaysia, 2010).

However, most of the teachers feel that there are several areas in which they need more guidance and assistance. According to TALIS of 2009, demand for more professional development is at 83% which is above 28% of TALIS international average of all countries. Teachers has stressed the need for more professional development in areas such as content and performance standards, students assessment practices, classroom management, subject field, instructional practices, ICT teaching skills, student discipline and behaviour problems, school management and administration, teaching in a multicultural setting and student counselling. The percentage of all these areas is much greater for Malaysian teachers than all the other countries surveyed by TALIS (OECD, 2009). Another study conducted by Idris et al (2006), to examine the professional preparation of Malaysian teachers to teach mathematics and science in English, showed that many teachers perceived the need for more training. They have highlighted areas such as speaking in English, delivering instruction, devising strategies for teaching, guiding students to use Englsh in learning science etc (Idris et al, 2006). Malaysian teachers also put forward the interest for more professional development in the area of ICT education (Zakaria & Daud, 2009).

With improvement of the curriculum, the teachers need to be trained and prepared to deliver the contents of the curriculum (Idris et al, 2006). However in Malaysia, in-service teachers are trained under certain themes or topics such as preparing teachers to teach students with special needs. The results of this can be seen that TALIS 2009 results shows that the only area that Malaysian teachers need less guidance than the international average is teaching students with special needs (OECD, 2009). Despite the several efforts made by the Ministry of Education to provide quality teacher training and in-service courses (SEAMEO, 2003), the teachers urge to more professional development in different areas is relatively high (OECD, 2009). The in-service programs conducted should be based on the needs of the teachers and hence identification of these needs is very important (Zakira & Daud, 2009). However, the Malaysian solution to such major changes has been a very top-down approach. That is the government takes the initiation for the projects instead of schools taking the initiative in such projects (Kader, 2008).

Hence the teachers and the schools are not well prepared for such projects and face many difficulties in adapting them. These teachers need cooperation and sharing of knowledge by other teachers and experts to overcome these difficulties. According to OECD (2009), cooperation by Malaysian teachers as in most other countries, are in the form of exchanging and coordinating ideas and information. They lack direct professional collaboration such as team teaching. Even so the relative use of professional collaboration in Malaysia is quite low compared to teachers in other countries (OECD, 2009). The attempts for professional development occur at individual schools and there is seldom any interaction and sharing with teachers from other schools or other districts of Malaysia. Hence this may be the missing component in in-service teacher professional development of Malaysia.

Teacher Professional development should not be restricted just isolated individual requirement, but requires support from the external environment. The teachers need a more flexible and open platform where they could be highly interactive and share the ideas. The in-service teachers from any part of the Malaysia should be able to join training online, share resources and get along with collaborative community. Hence a more systematic and well organised plan for teacher professional development is needed in order to ensure that the needs of the teachers are being well catered or cared for.

Related work

According to Lockitt (1997), maximum learning could take place with a combination of flexible learning styles, an understanding of efficient learning strategies, supported by information learning technologies within a flexible and supported environment. Collaborative Web-based learning System is a system which has all the component of such an environment. Currently several collaborative and communicative programs are on the market. All these are aimed to develop a better collaborative environment for learning and teaching process. These systems can be categorised into two groups: Collaborative learning platforms and teacher development collaborative platforms.

Collaborative learning environments enable individuals to share information and learn collaboratively to enhance maximum learning. It makes lives of individuals easier by providing flexibility of learning by making learning more reliable and more portable. Due to this reason, e-learning plays a vital role in lives of learners and of learning and training organisation (Lewis & Whitlock, 2003). Such E-learning and collaborative learning systems include, FUB (Haake et al, 2002), Virtual web based collaborative classroom (Permchiswadi et al, 2010), Speech enabled assistive Collaborative platform (Kolias et al, 2008).

At German FernUniversitat Hagen is a distance Learning University, who has identified collaborative synchronous activities such as support for preparation exercise, learning group management, collaborative learning session and learning management. Keeping these factors in mind, Haake et al (2002) proposes a system that supports collaborative exercises, which is called FUB system, by providing groupware tools for each phase of collaborative exercises. This system have unique functions of providing decided support mid-term collaborative exercises and hence it suggests necessary features of next negation learning platforms (Haake et al, 2002).

Most of the existing E-learning systems cannot ask questions and get responses immediately and there is no effective social interaction. To overcome this, Permchiswadi et al (2010) developed a system that combines the technologies of virtual interactive classrooms and web based collaborative work. This system can work as a substitute for a classroom. The students and teachers have to login using a username and a password to enter virtual classroom which will allow them to study collaboratively. The classroom has four main portions; the picture screens for teacher and students, workspace, list of people screen and real time chat screen. The teacher will have the full control and authority to control the class and deliver information. This kind of system provides opportunities for learners to study from any place limiting the barrier of space, time and cost of travelling (Permchiswadi et al, 2010).

A speech enabled assistive collaborative plat form is a collaborative system for educational purposes that can be accessed by heterogeneous hardware platforms such as PCs, PDAs, mobile or traditional phones due to its capability of representing data in vocal manner. Its main purpose is to provide a platform for collaboration between university students and teachers in a way that enhances students' access to educational resources and their overall learning experience. This is achieved by personalizing its content at least to some degree. Its special feature is acoustic/vocal characteristics which may be very useful for learners with visual or kinetic impairments (Kolias et al, 2008).

Collaborative teacher professional development systems are developed for the teachers to work collaboratively with other teachers, to share and distribute information for their professional development.

Some of such systems include Collaborative TPD system (Zhen at al, 2010), eCPDeIT (Ming et al, 2010), SMIT-TReC (Bakar et al, 2006), OCLP (Jiao, Liu & Liu, 2008), Eduwiki (Zhou & Gong, 2008). Based on collaborative learning and activity theories, Zhen et al (2010), build a network to teach and research environment for teachers, where learning activities can take place individually as well as collaboratively. This system will enable teachers to carry out teaching and research activities through coordination team, apply for teaching and research activities, invite other teachers and experts to participate in their activities. The teachers will also write reflection blogs, participate in collaborative prepared lesson and involve in activities of professional development (Zhen et al, 2010). e-CPDeIT is a model based on *Improvement Quality Education for All* (IQEA) action research framework which has been used in UK for the improvement of education. A pilot study using e-CPDeIT model held for 20 teachers of 5 smart schools of Malaysia showed that all 20 teachers received it very positively. They are very keen and enthusiastic to engage in such professional development. This project was build to provide the teachers pedagogical understanding by engaging collaborative groups. The teachers shared text based narratives of good lessons through blogs, shared video clips through VIP (Virtual interactive platform) and participated in discussion forums regarding lessons (Ming et al, 2010a ; Ming et al, 2010b).

SMIT-TReC is a Science, Mathematics and IT Teacher Resource Centre that helps teachers to enhance their professional development. It is an online centre that aims to form an online community which simultaneously foster collaboration among teachers and assist teachers in overcoming their problem related to professional development. This system is specially developed for science, mathematics and IT teachers for effective teaching and proper professional development and share resources online (Bakar et al, 2006).

Eduwiki is a web-based collaborative lesson-preparing groupware system, which promotes teachers group professional development under the guidance of community of practice. It utilizes wiki technology to establish CSCW environments which are suitable for the special needs of collaborative research and teaching, especially for collaborative lesson-preparing activities. Generally, combined with the above needs of teachers, Eduwiki is a powerful tool for building an innovative working environment for teachers to cultivate teaching and learning knowledge (Zhou & Gong, 2008).

Online Collaborative Lesson Preparation (OCLP) is a platform for teachers to create, share and utilise their knowledge. With the help of knowledge management theory, this system proposes new ways for integrating knowledge management concepts into OCLP systems (Jiao, Liu & Liu, 2008). Xu and Yongcun (2010) describe the importance of application of agent, workflow and collaborative control mechanism in a collaborative community and shows how they support the training of teachers (Xu & Yongcun, 2010).

Teacher Readiness for Collaborative professional development systems

A study conducted by Lim, Abbas and Mansor (2010), to find the views of teachers about the use of CWTPDS revealed that the Malaysian teachers participated in this study are very positive about it and are ready in terms of basic ICT competencies. Kao et al (2011), conducted a study to explore the relationships between teachers' motivation toward web-based professional development, Internet self-efficacy, and beliefs about web-based learning. This study indicated that the teachers' Internet self-efficacy and behavioural beliefs about web-based learning were significant predictors for their motivation toward web-based professional development. This study was based on 484 elementary school teachers from 30 different elementary schools in Taiwan, whom they expressed higher motivation toward web-based professional development. (Kao et al, 2011).

According to Kao & Tsai (2009), a study conducted in Taiwan with teachers from 20 different schools reveals that teachers who have positive attitudes towards online learning are motivated to use web-based professional development systems. Kollias et al (2005), conducted a study based on 56 teachers from 4 European countries showed that teachers were positive about online collaborative learning environments despite their cultural differences and geographical boundaries. This study also highlights the initiative role of teachers to enhance the personal professional development. Hence these studies show that teachers are ready for such a system and their attitude is very positive.

Approach to the problem

At present, the professional development of the in-service teachers is being done using a very manual approach where the teachers are trained for particular skills in training course. Due to this the teachers has urged for more professional development in different areas. The teachers need has to be identifies and met in order to make them more efficient in teaching and hence improving the quality of teachers. At the same time with the ongoing improvements to the curriculum, teachers need to be trained to deliver the content well. They have to be made aware of the new technologies and strategies that could be used in teaching.

Moreover the lacking component in the professional development of the teachers in Malaysia, professional collaboration has to be included in their professional development. In order to overcome the difficulties faced in teacher professional a web based collaborative teacher professional development system will be the best solution. Such a system will provide a platform for the teachers to work collaboratively despite of the distance and time. This system should be an interdependent collaboration of all the departments that are involved in teacher professional development as shown in figure 2.

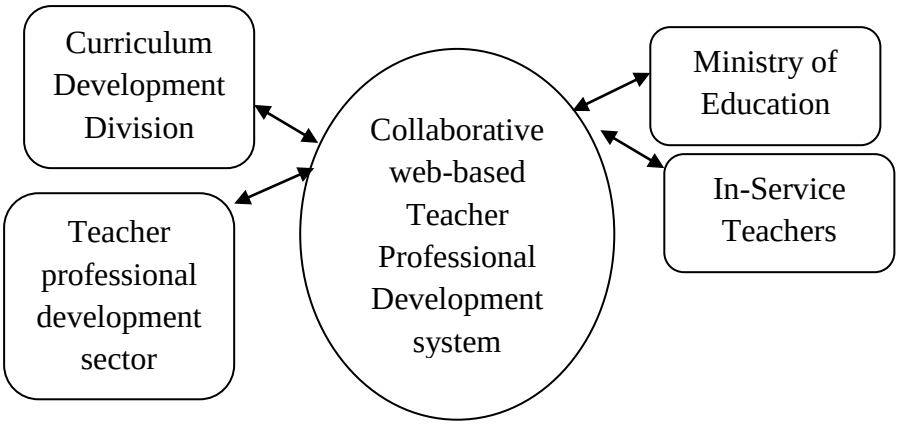

Figure 2: Actors of the system

Design Model

The model captures many of the key features of successful interaction using the ICTs. It appeared to be similar with much of the research literature that identified many of the successful features of professional development experiences of teachers. This model indicates the need for content to be grounded in the reality of the teacher's context; communication with colleagues in similar situations; sustained follow-up; and, action research pedagogy where teachers can reflect on their practice. ICTs were seen as the medium that would overcome a number of issues that negated equity of access to all teachers eligible to participate in professional development programs (Vance & McKinnon, 2002).

The delivery model presented in Figure 3 below is comprised of three key design elements:

1. a resource and interactive delivery system;
2. a needs-driven pedagogy that is constructivist in nature and informed by action research; and,
3. significant others, as well as a collaborative system for linking participants with the elements and with each other.

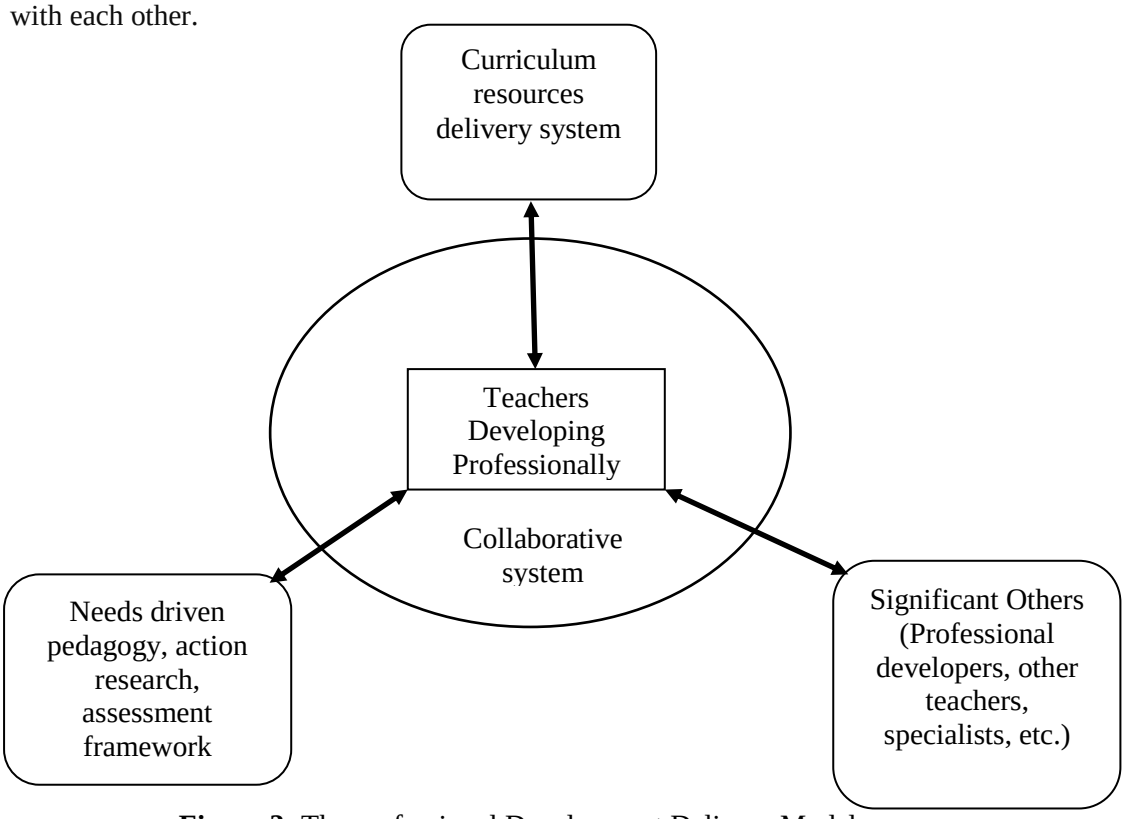

Figure 3: The professional Development Delivery Model

(Model from McKinnon et al, 1998 as adapted by Vance et al, 2002)

The *Curriculum Resources Delivery System* is an interactive database related to the distribution of resources and updates brought to the curriculum.

The *Needs Driven Pedagogy* recognises that participants, all experienced teachers, have unique experiences and context-based needs. An action research framework that is well-used in professional development underpins the pedagogy. In this case participants document their beliefs and experiences, have guided interaction (modified at a personal level) with the resources; take, enact, modify the information to suit individual contexts and analyse and apply it by writing context based assignments. Finally participants are asked to evaluate the information and their learning and report these both to the group and to the facilitator (Vance & McKinnon, 2002).

Significant Others includes the other teachers using the communication system and specialists who provide participants with the support and guidance they may require as they work with the program.
The *Collaborative System* acts as a link between the participants in connecting them to the three design elements. It is a system which enables the participants to share all the information in the form of audio, video and messages.

Organisational change model

Employing a new web based teacher professional development system will include several organisational changes which can be considered as a dynamic evolve into a new level. But managing such a change process can be highly complex task and involves several barriers to it. However, applied models of knowledge management provide better insight into the developing action plans that result in transfer of knowledge among and between the people. Leavitt's (1965) model of organisational change, proposes that change may focus on one of the four subsystems in an organisation. According to Leavitt, the effectiveness of a program depends on balance between four organisational subsystems: technology, structure, tasks and people. The model shown in figure 4 demonstrates how these four elements are interrelated. These four components are interdependent, where a change in one can result in change in others. When technology is changed, the other components often adjust to damp out the impact of innovation. While changing the present professional development methods to a new technological system, all four components will be undergoing a rapid change. Hence there will be a complex changes that occur within the present system.

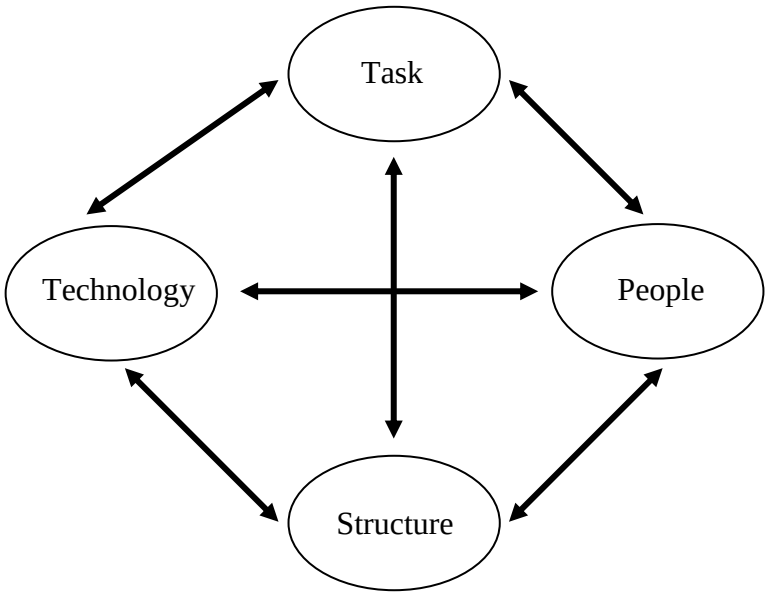

Figure 4: Leavitt's Model of Organisational Change

Features Used in Web-based Collaborative Technologies Systems

The features in a collaborative web-based system allows its users to explore, engage, share and connect with people and contents in a valuable way that would help them in learning. These features include:

- **Internet Forums**: A virtual discussion platform to facilitate and manage online text messages;
- **Online Chat/ Instant Messaging** (Synchronous conferencing): It's a virtual discussion forum that facilitate and manage real-time text messaging;
- **Data Conferencing**: Are networked PCs that share a common whiteboard that each user can modify;

- **E-mail** (Asynchronous conferencing)
- **Web Conferencing**: it is used in conducting live meetings, training, presentations via the internet;
- **Electronic calendars**: it is used in scheduling events or consultations and automatically notify and remind the user;
- **Content Management System**: can be used in managing workflow in a collaborative environment;
- **Weblogs**;
- **Online Word documents** (Microsoft Word, etc): used in editing documents and sometimes used in quizzes or tests for the learners;
- **Online Spreadsheet**: collaborate and share structured data and information.

The advantages of using a web-based collaboration technology as a learning tool

According to Weisberg (2000), work environments that are conducive to teamwork emphasize team efforts over individual competition and foster the "shared understanding" of goals. They also support risk-taking behavior, reward creativity and encourage criticism and debate. More and more web based systems is created everyday to accommodate its different demands for educational purposes that would be used later by different institutions integrated to their systems. Some of these web-based systems are paired with the internet to create a collaborative platform that can be used for learning processes by students as well as teachers. In this case, we would be looking at the advantages and perhaps the disadvantages of using the technology as learning tool. Some of these advantages include:

- **Transfer of knowledge**: the knowledge, skill, experiences they acquire from the educational training through the learning tool were later applied and used in solving real problems in an actual work environment.
- **Working as a team**: the teachers were able to apply their collaborative learning principles to perform their tasks in their work environment. Their ability to work together was an important outcome of their attachment. This experience would help them to plan and organize future collaborative teaching and learning projects in educational institutions.
- **Expanding creativity and innovation**: The teachers reported that they were able to expand and stretch their creativity to think of innovative ideas. This attachment not only helped them but also the researchers and programmers to further improve the tool for collaborative learning activities by taking into consideration suggestions and ideas offered by the trainees (Hussain, 2004).
- **Improving instructional strategies:** a web-based system enables teachers to solve problems faced by their daily teaching and gives support in numerous ways to deal with the new challenges they face. It also brings essential transformations to the instructional practices they perform in the classroom (Lim & Chai, 2008).
- **Improve professional image:** This can improve their professional image by enhancing their expertise, in computer capabilities. For the individual teacher, being able to learn new technology and skills could allow the integration of different territories with the teacher's own knowledge and capabilities. Conducting web-based collaborative learning could also enhance the feeling of achievement and the teacher's image as an expert in certain areas (Hsiao et al, 2010).

The disadvantages are that the teachers were not given time to practice more on the skills they have acquired because there was not enough time to be wasted and also the tools used where a bit strange to the teachers and it would be better they can be told of the tools or taught how to use this tools before the program.

Conclusion and recommendations

Collaborative web based systems use different technologies to support several entities involved in a given process to work together on a specific task within a shared environment. For instance, there are several collaborative web-based systems that are in use since late nineties (Ying-xiu et al., 2004). These systems allow for collaborative design and modeling either though a network or the internet. Existing web-based, collaborative web-based systems have been designed in such a way that the server contains a global model, while every client owns a local copy of the shared web based model.

However, enabling new ways of working is crucial thus a radical shift in the destination and communication behaviours of workers. Collaboration technologies enable teachers to remain highly productive, no matter where and when they work. Hence a teacher professional development system will play a crucial role in the development of teacher professionalism in Malaysian teachers. Therefore a web based collaborative teacher professional development system is very essential for teacher professional development of Malaysia. It will aid in reducing time and cost constraints and helps in globalisation and communication between teachers.

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