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## **Project Work Collaboration in an On-Line Computer Supported Environment**

Angela F. L. Wong  
Shanti Divaharan  
Liu Woon Chia  
Quek Choon Lang  
Jarina Peer

National Institute of Education  
Nanyang Technological University  
Singapore

### **Abstract**

In Singapore schools, Project Work (PW) is implemented in grades 3 - 5, 7 - 9 and 11. The purpose is to help students develop thinking skills, communication, collaborative learning, self-directed inquiry and life-long learning skills. When PW was first implemented, teachers were provided detailed guidelines and resource packages to help them get started. After that period, teachers were expected to design authentic project tasks independently. They would therefore have to schedule and hold numerous face-to-face discussions with their colleagues to discuss the requirement, scope and depth of each project task. This was still manageable if all of them are in the same school. However, with an increasing number of inter-school collaborations, such face-to-face meetings became more difficult to schedule. This is where technology could be deployed to help teachers hold such discussions more effectively. This paper reports how a group of high school teachers from different disciplines and schools used the Knowledge Community (KC) e-learning platform to collaboratively design project tasks for their students. The activities they engaged in and the feedback obtained from focused group discussions will be shared. Suggestions and the feasibility of adopting such an online learning approach for PW in schools will also be discussed.

Keywords: Project work, e-learning, online learning

## **Introduction**

In 1996, the Singapore Ministry of Education (MOE) launched two initiatives, that is, National Education (NE), and the Thinking Programme (TP). A third one, the Master Plan for Information Technology in Education (MPITE) I, was introduced the next year. Three years later, the Project Work (PW) initiative was launched in 1999. This was followed by the launch of the IT Master Plan II in 2002, and the Innovation and Enterprise initiative in 2003. These initiatives represent the change in the landscape in our education system and as a nation itself. While the NE initiative calls for us to better understand our existence as a nation, the PW initiative aims to better prepare our students for the challenges of the 21<sup>st</sup> century and to achieve our country's vision of Thinking Schools, Learning Nation (TSLN).

PW is implemented in schools and across all levels ranging from primary schools to pre-university. Learning opportunities are provided for the exploration of the inter-relationships and inter-connectedness of subject-specific knowledge. PW provides the platform for students to be better equipped with creative and critical thinking skills, have their communication skills improved, their collaborative learning skills fostered, and their self-directed inquiry and life-long learning skills developed (Ministry of Education, 1999). In order to actualize the impact of projects on students' learning, teachers play significant and important roles in designing projects to accomplish the desired learning goals self-directed inquiry. This study focuses on how teachers craft interdisciplinary projects (which require students to apply knowledge and skills from 2-3 disciplines) collaboratively in an asynchronous online environment.

## **Related literature**

Jonassen strongly believes that technologies should be used as tools to engage and facilitate thinking and knowledge construction by learners (Jonassen, Peck & Wilson 1999). One such powerful technology that serves these purposes is Computer Mediated Communication (CMC), also commonly referred to as a conversation tool (Jonassen, 2000). It allows the learners to communicate, represent and reflect their understanding,

beliefs and perspectives. It also enhances problem solving processes (Jonassen & Kwon, 2001) and metacognitive skills of participants (Harassim, 1990) while they are engaged in the exchange of ideas. In addition to providing a context for collaborative learning, the participants rehearse their discipline-based discourses (Lea, 2001), thereby providing opportunities for the learners to appropriate the “ways of seeing” (Hung, 1999) of the experts.

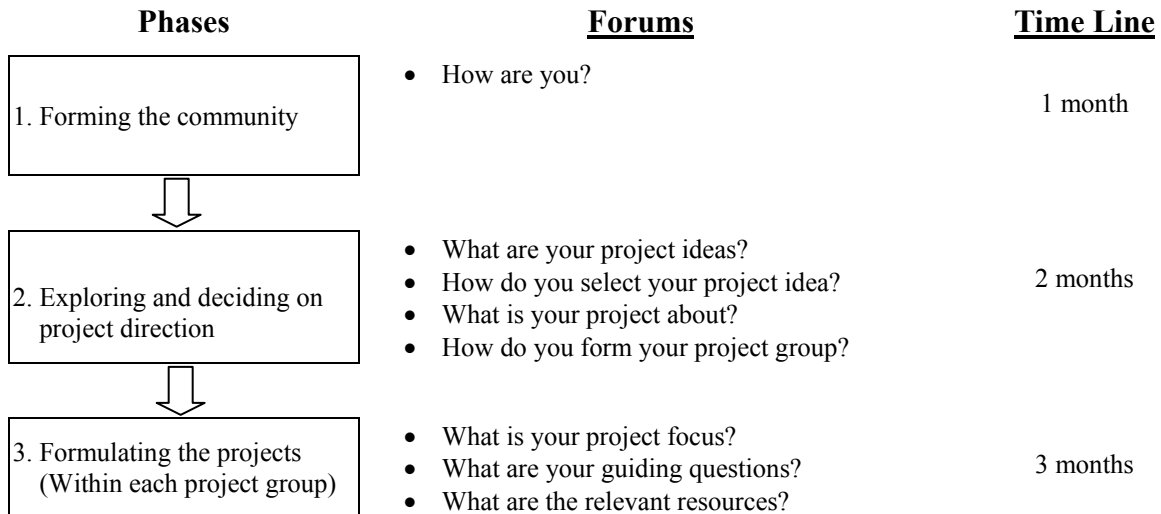
According to Angeli, Bonk and Hara (1998), an asynchronous computer conferencing platform promotes reflective learning because the participants are able to view the notes discussed earlier and think through the ideas and issues raised by their peers before responding. As such participants form their online learning communities. These communities are intellectually rich and fertile grounds for working with ideas. Such communities in turn help participants to better understand the subject matter discussed. This in turn leads to them developing innovative approaches towards teaching and learning (Lamon, Reeve & Caswell, 1998). Other related studies also supported the fact that CMC tools are designed in accordance with social cognitive principles of learning. This has brought about significant learning gains among learners who exhibit characteristics such as being active, reflective and self-directed (Scardamalia & Bereiter, 1996).

### **Method**

This study was launched in 3 phases which consisted of the pre-crafting, crafting and post-crafting processes. Forty teachers from 8 secondary schools in Singapore participated in the study. There was an average of 5 teachers who taught subjects such as English, Mathematics, Sciences, History and Geography coming together to form Project Work teams per school for this research project.

Prior to the project crafting phase, these 40 teachers attended a 3-hour workshop on “Student-centred learning in the context of Project Work (PW)” conducted by the researchers. The researchers also facilitated the teachers’ crafting of interdisciplinary projects collaboratively in a computer-supported learning environment, known as

Knowledge Community (KC). These teachers participated in numerous planned forums (as shown in Figure 1) of on-line asynchronous discussions to craft the projects that they were interested in.



**Figure 1 Overview of three phases of some forums participated by teachers**

These forums, facilitated by the researchers, constituted the roadmap of project crafting in this study. The entire crafting process required the teachers to type notes for communication in the forums as shown in Figure 2. At the end of the crafting process, one face-to-face session was organized for the teachers to discuss the implementation of their crafted projects across schools. This was followed up with Focused Group Discussions with the participating teachers in their schools. One discussion was conducted per school. A set of guided questions was used and the researchers took turns to facilitate these discussions.

### **Analysis of teachers' discussion forums**

By analyzing the teachers' asynchronous online discussion forums, the following practices emerged while the teachers were crafting their projects collaboratively:

- Forming inter-school project groups

The teachers formed inter-school project groups to discuss their project ideas, collaborate by taking turns to facilitate group discussions within the project group, set weekly

communication plan to allow group members to post notes, reach intermediate goals or make decision before they proceed to the next forum. However, not all the project groups were able to set up their own communication schedule in terms of posting and responding to notes.

In the forum “How are you?”, the teachers were apparently surprised at the breadth of interaction made available to them through the online environment. Subsequent to this, they were able to talk casually, often expressed in short written forms such as “btw” which means “between” and “cos” which means “because” in the forum. In the subsequent forum “What are your project ideas?”, the teachers participated actively and asked questions to clarify their thoughts in this forum even though this was their initial experience in using asynchronous online discussion. This phase of collaboration showed that an online community of project crafting was starting to form before the subsequent online collaboration within each project group actually took place.

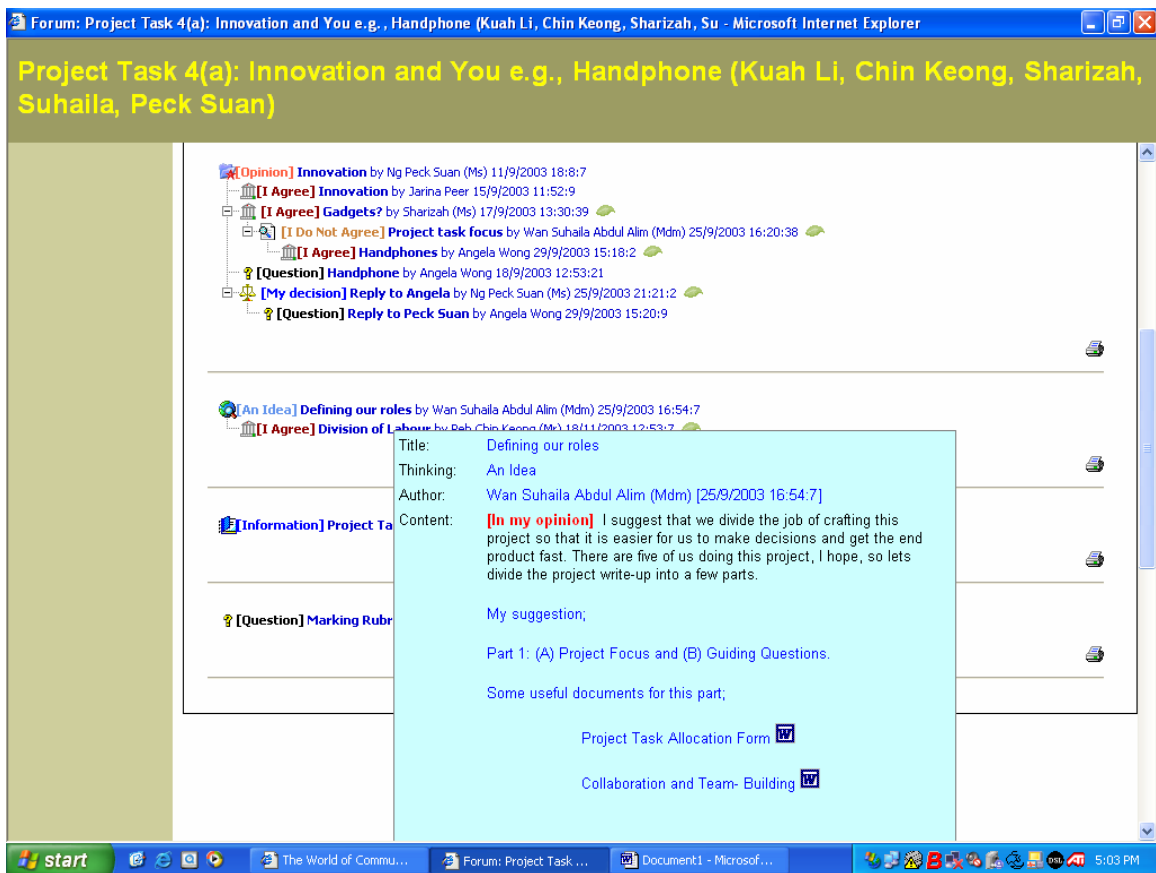
- Using thinking types and scaffolds in online asynchronous discussion forums
- The teachers posted their project ideas actively using thinking types and scaffolds provided in the asynchronous online discussion environment. They expressed their thoughts by selecting the appropriate thinking types to indicate their thinking dispositions. They used scaffolds such as “My idea” and “I need to understand”. The teachers typed and posted their own notes in their asynchronous online discussions during each of the forum. Altogether, 12 forums were set up, and 472 notes were written by these 40 teachers. Each teacher contributed an average of about 20 notes.

These teachers examined the ideas posted, asked questions and selected their project ideas. Based on the teachers’ project ideas, 8 project titles were formulated by the end of 3 months. These interdisciplinary projects are :

- Planning a school event
- Computer games
- Innovation and You
- Enterprise & you
- Disease outbreak
- New Singapore (renamed Futuristic Country later on)

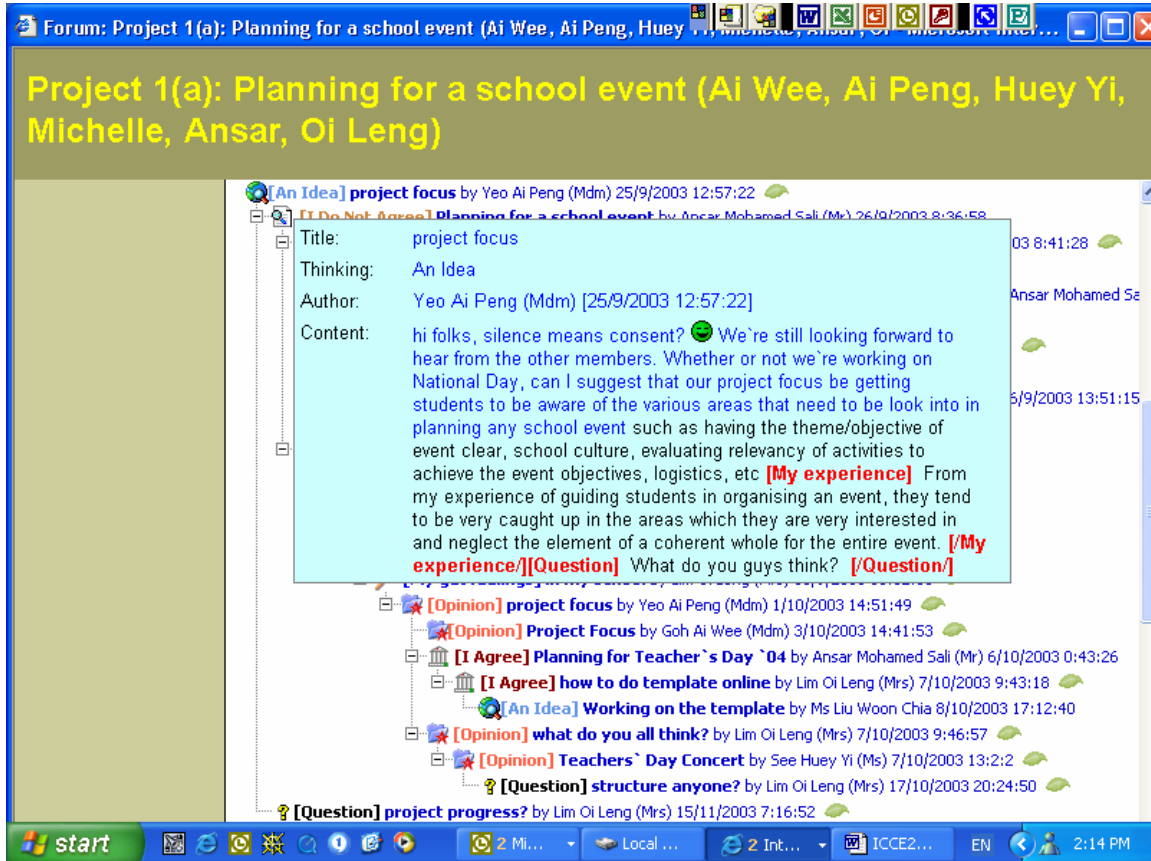
- Our forefathers
- School heritage

With the researchers' facilitation, each teacher selected one of the above project ideas and collaborated with teachers from 2 or 3 other schools who chose the same project task to craft their projects. Figure 2 shows how a group of teachers started their collaboration in project crafting and how one of them included the project focus and resources (seen in the form of attachments) for the project entitled "Innovation and you".



**Figure 2 Teachers' crafting of project entitled "Innovation and you"**

Figure 3 shows how another group of teachers tried to incorporate their concerns about their students' interest in the project entitled "Planning for a school event". This phase of collaboration shows how the that project groups were formed and how members started to identify with each other by sharing their views, summaries, experience and their expertise in the online project crafting. During the online collaboration, the teachers also demonstrated their ease and confidence in more focused discussions using asynchronous online discussion forums.



**Figure 3 Teachers' concerns about their students in the project entitled "Planning for a school event"**

- Achieving the goal of crafting interdisciplinary projects by groups
- At the end of almost 6 months of online project crafting, the teachers consolidated all their discussion notes into the project crafting template. The researchers planned a "face-to-face" meeting for the teachers to refine their crafted projects and develop the curriculum for both the teachers' and students' use in the Project Work (PW) classroom. Figure 4 shows the project web, guiding questions and curriculum links based on the teachers' crafting process for the interdisciplinary project entitled "Our Forefathers". All these 8 project tasks were implemented in their own schools' PW classrooms the following year.

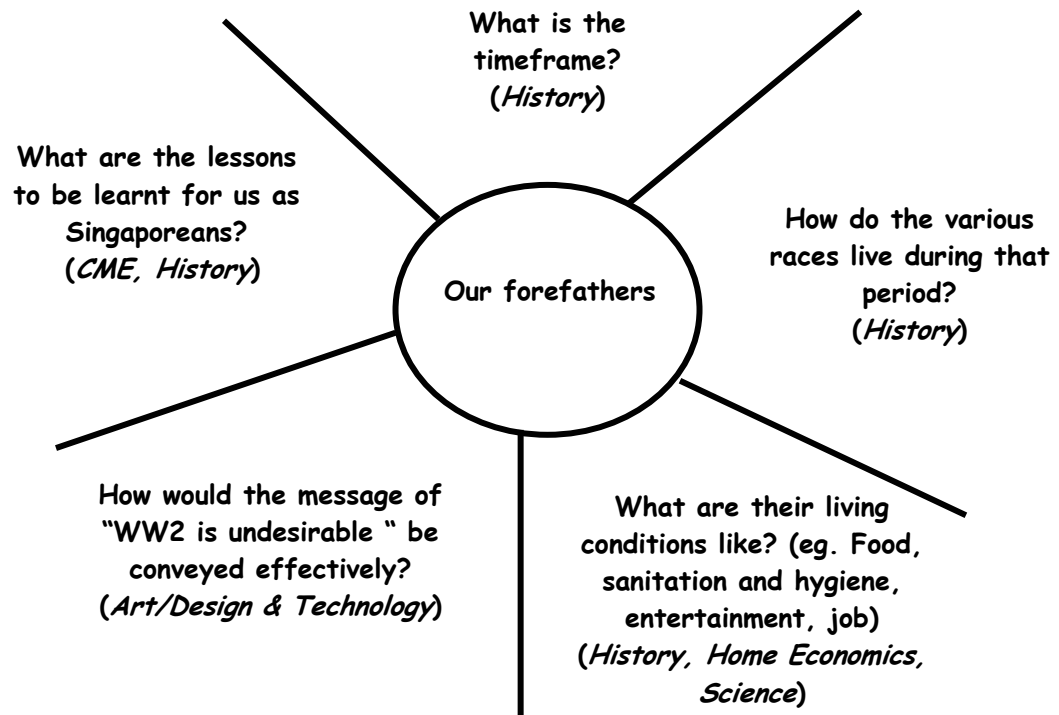


Figure 4 "Our forefathers" with project web, guiding questions and curriculum links

### Feedback from the Focus Group Discussions

Eight Focus Group Discussions were conducted, one for each school. In each discussion, the researcher-in-charge fielded questions to help the teachers focus on the following areas :

- about the research project
- about the group project

In the discussions on the first area "about the research project", teachers sought clarification on the scope and requirements of the project. For example, they wanted to know how many teachers per school could participate in the crafting of each project task, how many schools had to work together, whether they need to come up with the product for their project task. They were also concerned about the schedule of school activities during the duration of the research project. This led to discussions on what their level of involvement entailed in the first phase of the research (Crafting of project tasks by



teachers) and how their students will be involved in the second phase of the project (Implementation of project tasks with students). Implementation issues and logistics dominated this discussion.

With regards to the discussions on the second area “about the group project”, teachers reported the difficulties they faced in communicating with each other to work on ideas using the KC platform. These difficulties ranged from technical problems to interpersonal problems. Some said that their counterparts in the other schools were tardy in responding to their postings, delaying the formation of inter-school project groups and the project crafting process. They felt that using the asynchronous on-line discussion mode provided by KC is inconvenient. One group of teachers suggested incorporating more instantaneous means of communicating in KC – in particular, instant messaging like ICQ and MSN. To help solve this problem, the researcher got the teachers from each school to commit to certain on-line meeting time slots so that their counterparts from the other schools would know when to “find” them. Being busy people, the teachers also remarked that they found it difficult to keep track of what they had to do and when they had to do them. So they suggested that reminders be sent to them on a regular basis.

### **Conclusion**

These 40 teachers who came from 8 schools (an average of 5 from each school) experienced using asynchronous online discussion forums to craft interdisciplinary projects. Their collaboration has enhanced their pedagogical knowledge, skills (including interpersonal and IT skills) and attitude towards project-based learning in an on-line environment.

By using the asynchronous online discussion forums, the teachers collaborated by forming project groups, using scaffolds and thinking types, communicating with individuals with different teaching experiences and perspectives, brainstorming project objective and direction and developing creative and authentic projects to be used by their students. They also demonstrated confidence in handling some of the technical obstacles

faced when using asynchronous online discussions and overcame the numerous problems in logistics as well. Despite all these challenges, they achieved their common goal – that is, the crafting of interdisciplinary projects collaboratively, across schools, using an on-line platform.

Most primary and secondary schools in Singapore have already invested in some form of Learning Management System (LMS). Based on the results from this study, it would indicate that schools could now use these systems to conduct PW via an online learning approach. Depending on the capability of the LMS that a school has, the teachers can customise and facilitate the online discussions according to the needs of their students. As a start, schools may want to use their LMS to experiment with inter-class collaborations, that is, getting students from different classes to form teams to work on project tasks. Later on, they could move on to explore inter-school collaborations as was done in the present study.

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