21st Century Learning Design for a Telecollaboration Project

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Abstract

Recognizing the principles of student-centered approach using project-based learning, and information technology to enhance the quality of education, a telecollaboration project entitled Food for Life had been designed and implemented by Thai and Mongol teacher educators. The project aimed to provide 21st century learning experiences for pre-service teachers which are 33 third-year undergraduate students in Faculty of Education, at Suan Sunandha Rajabhat University, and 24 third-year undergraduate students in Faculty of Foreign Languages at Mongolian State University of Education. The design had incorporated technology-enhanced pedagogies into instructional practices. Information and communication technology tools such as Aculearn system, Google+, hangouts, were utilized for telecommunication between two countries. Assessment tools were Criteria for Project-based Learning and 21st Century Learning Designs (21CLD) Rubrics introduced by APEID/ICT in Education Team of UNESCO Bangkok. The results yielded effectiveness in four categories including collaboration, knowledge construction, the use of ICT for learning, and real-world problem-solving and innovation.

Keywords: 21st century learning, instruction design, project-based learning, telecollaboration learning

1. Introduction

In November 2012, UNESCO Bangkok organized a training workshop to introduce the principles of student-centered approach using project-based learning (PBL) and telecollaboration to a group of selective teacher educators and teachers in the Asian-Pacific region under an initiative project called Reorienting Quality Teacher Education towards EFA and ESD. One component of the workshop was to assist teacher educators and teachers to integrate inclusive education and education for sustainable development (ESD) concepts and contents into their curriculum and teaching materials through the use of information and communication technology (ICT). The participants were
encouraged to incorporate technology-enhanced pedagogies into their teaching practices by developing a group project to implement after the workshop. During the workshop, a Thai teacher educator from Suan Sunandha Rajabhat University (SSRU) paired up with a Mongol teacher educator from Mongolia State University of Education (MSUE) and proposed a PBL telecollaboration project on ESD focusing food-related contents. Hence, the Food for Life project was emerged (Makaramani & Bayarchimeg, 2013). At the beginning, its proposed goal was to have a selected group of pre-service teachers from each country learning to live together by working under the project. The proposed learning objects were to have awareness of global issues relating food, to understand the value of food in terms of cultural, economic and nutritious, and to appreciate cultural diversity between Thailand and Mongolia. However, due to incompatible ICT infrastructure and different academic orientation and calendar, the project was adjusted to accommodate possible and practical arrangement. Each country then worked on their suitable instructional design under the same food-related themes. For SSRU, the class had already started in November while MSUE would begin in January. So, the SSRU corresponding teacher educator had incorporated the proposed PBL telecollaboration project into an existing course named *Innovation of Learning*. The course has been required for all Thai pre-service teachers enrolling a 5-year Bachelor of Education program in the Faculty of Education, and it was basically technology-enhanced pedagogy. Thus, by adjusting instructional design of the course, the SSRU teacher educator managed to implement the proposed project that harmoniously covered both the project and the course expectations. The design had been significantly supported 21st century learning through project-based learning activity and telecollaboration via ICT. Two months later, the project was incorporated to a *Culture Study* course for Mongol pre-service teachers in the Department of Foreign Languages at MSUE. The corresponding teacher educator applied and adjusted some learning activities of the SSRU design to suitably serve the target course expectation. During implementation of the project, both corresponding teacher educators had discussion and exchanged comments for improving their learning activities via ICT tools. The involved pre-service teachers had been worked in groups on their food-related project assignment and shared their finished projects through telecommunication tools. In consequence, the overriding question was ‘how effective was the learning design of this telecollaboration project?’

2. Related Literature

2.1. Understanding 21st century learning

Partnership for 21st Century Skills (2008) suggested that provision of learning to prepare people to live successfully in the 21st century required more than subject contents. People need to know how to use their knowledge and skills by thinking critically, applying knowledge to new situations, analyzing information, comprehending new ideas, communicating, collaborating, solving problems, making decisions and so on.

The Partnership presented framework for 21 century learning that put student outcomes into 3 categories: 1) learning and innovation skills; 2) information, media and technology skills; and 3) life and career skills. The first skills included creativity and innovation; critical thinking and problem solving; communication and collaboration. The second skills involved information literacy; media literacy; and ICT literacy. The third skills included flexibility and adaptability; initiative and self-direction; social and cross-cultural skills; productivity and accountability; leadership and responsibility.

2.2. Understanding project-based learning

In 21st century workplace and life, people require more than basic knowledge and skills to success and happy. The project-based learning (PBL) is considered to be an effective and enjoyable way to learn. Students not only learn content more deeply but also learn how to take responsibility, build confidence, solve problems, work collaboratively, communicate ideas, be creative innovators, etc. (Buck Institute of Education, 2010). Thus, PBL provides an effective way to address the 21st century competencies. With technology, learning with and from experts and specialists around the world can be done. Resources and information can be accessed more easily and effectively. In designing a good PBL, Larmer and Mergendoller (2012) suggest 8 essentials to be considered. There
are 1) significant content 2) a need to know 3) a driving question. 4) student voice and choice 5) 21st century skills 6) inquiry and innovation 7) feedback and revision and 8) publicly presented product.

2.3. Understanding telecollaboration learning

In general, telecollaboration is systematic process of communicating and working with other people or groups from different locations through online or virtual means to produce a desired work output. In education realm, telecollaboration is problem-based learning framed within a real context using telecommunication tools such as emails, chat, smart phones, wikis, forum or other types of web communication. The process involves interaction between students from different places or even from the same classroom that lead to the completion of required learning objectives. Telecollaboration can be divided into three genres of online activity (Harris, 2002):

- **Interpersonal Exchanges** activities are those involve individuals talk electronically with other individuals, individuals talk with groups or groups talk with other groups.
- **Information Collection and Analysis** activities are those involve students collecting, compiling, and comparing different types of interesting information.
- **Problem Solving** activities are those involve promotion of critical thinking, collaboration, and problem-based learning.

3. Objectives

- To design a telecollaboration project supporting 21st century learning experience for pre-service teachers
- To determine effectiveness of the telecollaboration project according to the 21st century learning designs (21CLD) rubrics

4. Beneficiaries

The target group of the study was purposive, including 2 groups of pre-service teachers currently under supervision of the corresponding teacher educators. For Thai group, there were 33 third-year students enrolling a 5-year Bachelor of Education program with specialization in Early Childhood Education at the SSRU Faculty of Education, Bangkok, Thailand. The Mongol group from the MSUE Department of Foreign Languages, Ulan Bator, Mongolia, consisted of 24 third-year students going to be teachers of Russian and English.

5. Methodology

The telecollaboration project *Food for Life* had been designed with recognizing the principles of student-centered approach by applying project-based learning as a main learning activity. It aimed to enhance 21st century skills to the target group. The designed project had been implemented for a period of one semester during November 2012-March 2013 at SSRU and January-May 2013 at MSUE. Data collection instruments included questionnaire, lesson plans, portfolios, observation records, learning assignments, test scores as well as criteria for project-based learning and 21st century learning designs (21CLD) rubrics (SRI International, 2013) introduced by APEID/ICT in Education Team, UNESCO Bangkok. Data were analyzed by using content analysis and descriptive statistics.

6. Design and implementation

When the project *Food for Life* was initiated during the UNESCO workshop in November, the SSRU classes had already started while MSUE’s would begin in January. So, the SSRU corresponding teacher educator had incorporated the proposed PBL telecollaboration project into an existing course named *Innovation of Learning*. The course has been required for all Thai pre-service teachers enrolling a 5-year Bachelor of Education program in the Faculty of Education, and it was basically technology-enhanced pedagogy. By adjusting the previously designed
course, the SSRU teacher educator managed to implement the proposed project that harmoniously covered both the project and the course expectations. The design had been significantly supported 21st century learning through project-based learning activity and telecollaboration via ICT which was fully well-equipped in the institution.

Two months later, the project was incorporated to a *Culture Study* course for Mongol pre-service teachers in the Department of Foreign Languages at MSUE. The corresponding teacher educator applied and adjusted some learning activities of the SSRU design to suitably serve the target course expectation. During implementation of the project, both corresponding teacher educators had frequent discussion and exchanged comments for improving their learning activities via ICT tools. The involved pre-service teachers had been worked in groups on their food-related project assignment and shared their finished projects through telecommunication tools.

### 6.1. SSRU design and implementation

For Thai target group, the instructional design included 3 stages.

*Stage 1* had been administered during December 2012 and January 2013. The instructional activities were:

- Introducing the goal and objectives of the project Food for Life to students in the target group.
- Presenting an overview of project-based learning and assigning the target group to self-study a CD-ROM on project-based learning concepts and application constructed by Microsoft Intel Teach
- Creating Food for Life Community in Google+
- Introducing Google+ and its application, particularly Hangouts, to the target group
- Adding the students to be members of the Food for Life Community
- Communicating upcoming activity and assignment among members through the Community
- Organizing students into 6 groups, each group working on choosing their own topic relating food
- Group writing on project proposals and action plans
- Group working on their PBL projects for 5 weeks in their chosen real-life situation, solving problems and adjusting for better outcomes

*Stage 2* had been administered on February 2013. The instructional activities were:

- Group working on their projects, communicating and reporting their progress through the Food for Life Community and Google+ Hangouts
- Presenting on-line lesson entitled “What Is PBL?” to Mongol students via Aculearn-a SSRU teleconference system. Also, introducing Thai students and their projects to Mongol students
- Group preparation of PowerPoint presentation on their project
- On-line presentation of Thai students’ projects to Mongol students via Aculearn.

*Stage 3* had been administered on March 2013. The instructional activities were:

- Group constructing of websites to present their PBL project results: 1) Tom Yum Koong 2) Pad Tai 3) Khanom Jeen 5) Nam Pric Long Rua 5) Roti Sai Mai, and 6) Pad Krarpaw
- Attending on-line presentation of Mongol students’ projects via Google+ Hangouts
- Assessing 6 PBL projects and students’ performance
- Individual student reflection of learning experience through posting on the Community

### 6.2. MSUE design and implementation

For Mongol target group, the instructional design also included 3 stages.

*Stage 1* had been administered on January 2013. The instructional activities were:
• Introducing the goal and objectives of PBL and telecollaboration concepts to lecturers and students in the Department of Foreign Languages
• Preparing 3rd year students to be involved in the project and creating a team (6 members per team)
• Students choosing the theme, determining the objective and collecting a materials for each team

Stage 2 had been administered during February and March 2013. The instructional activities were:

• Attending on-line lesson entitled What Is PBL? performed by the Thai corresponding teacher educators, and attending Thai students presentation of their PBL projects
• Team working on their projects
• Preparation of PowerPoint presentation of the team project
• On-line presentation of Mongol students regarding their PBL projects to Thai students via Hangouts: 1) Boloroo 2) Doljko 3) Mika, and 4) Tuul
• Analysing the project process and providing a survey among the team member to identify what the student could learn from implementation of the project

Stage 3 had been administered on May 2013. The instructional activities were:

• Face-to-face meeting with Thai corresponding teacher educator at MSUE
• Attending a special lesson on effective PowerPoint presentation techniques performed by Thai corresponding teacher educator
• Performing a selected cultural presentation based on knowledge derived from the team project

7. Results

For the first objective, the instructional design of the tellecollaboration project was definitely supporting 21st century learning experience for pre-service teachers. It involved 100% of key elements and sub-elements on student outcomes according to framework for 21st century learning as defined by Partnership for 21st Century Skills (2008).

For the second objective, the results yielded effectiveness of the SSRU project at the highest level of the rubrics in five out of six categories including collaboration (5/5); knowledge construction (5/5); real-world problem-solving and innovation (4/4); the use of ICT for learning (5/5); and skilled communication (4/4). And it was at level 3/4 for self-regulation. The MSUE project yielded effectiveness at the highest level in collaboration (5/5); knowledge construction (5/5); and real-world problem-solving and innovation (4/4). It was at level 3/4 for self-regulation; level 3/4 for the use of ICT for learning; and level 2/4 for skilled communication. Thus, the overall project yielded significant effectiveness in four dimension of 21st century learning which are collaboration; knowledge construction; real-world problem-solving and innovation; and the use of ICT for learning.

Moreover, additional results were observed. Authentic assessment was also applied for Thai student performance. Their final grades were between A and B level. By applying self-evaluation of the PBL experience, Thai and Mongol showed similar results including having joy and fun (T=89%, M=75%), having English proficiency (T=5%, M=7%), having teamwork skills (T=85%, M=62%), own culture study (T=50%, M=55%), participation (T=94%, M=62%), and presentation skill (T=75%, M=16%).

8. Challenges and Obstacles

The project had faced some challenges and obstacles. Broad idea of the initial project proposal such as nutrition, food safety, etc., made the target groups confuse during orientation. However, they suggested and agreed on topics relating indigenous dishes. There were also language barriers between countries. Most students had low level of English proficiency. Different time zone caused some difficulties in managing on-line communication. Also, there was incompatible of ICT infrastructure between institutions. SSRU had more advance technology and variety of ICT tools to accommodate.
Significant observed advantages were:

- PBL provided a more challenging, motivating and enjoyable approach to education. PBL graduates performed better in respect of interpersonal relationships, reliability and self-directed learning.
- Telecollaboration helped discovering new information not only about other cultures but also about own national culture and heritage.
- Face-to-face as well as on-line meeting provided favourable conditions language learning. The teacher was also a student. By developing the program, preparing new lessons and teaching the students, we make one step for improving ourselves.
- Deep understanding the new concepts and using new approaches enabled us to determine what exactly should be learned and taught the new generation. Also, it helped us search for alternative ways and innovative methods for utilizing ideas to learn to understand each other among family members, colleagues, and people within society.
- On-line lesson of Thai teacher educator for Mongol students was the first experience in MSUE and stimulated active learning.
- Face-to-face on Hangouts and Aculearn between Mongol and Thai students enhanced their participation in learning and conducting the PBL projects.
- Assessment of Mongol students understanding of PBL revealed
- For successful achievement of the project implementation, it was important to identify the needs and interests of target groups and the goal and objective should been determined by them.

References