A Study of Aviation Technology Education with Transnational Internet d-Learning for Primary and Middle School

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Abstract: In recent years, there is a need to expand the performance of studying in order to build national power and improve the well-being for our country's people. At the 7th national scientific meeting, leaders drafted 6 tactics to guide the first stage of the national scientific development plan of Cheng (the 94-97th year of R.O.C.) for promoting the development of science and technology until 2008. The plan is to use the pool of operating dollars to fund improvement activities. As a result, the theme of Scientific and Technological Education International became the main theme for research in 2005-2008.

The purpose of the research is to:

1. Design a course with an emphasis on the transnational digit platform (d-learning) as a way to produce research and study internationally cooperatively and to promote the international exchange and study of science and technology education to a great extent.

2. Provide a clearing house for an international collection of science and technology teaching materials, teaching methods, teaching policies, and a means for distributing the information to small and medium school districts in Taiwan.

3. Provide an impetus to cooperatively study teaching and exchange the findings with the world. Aviation technology education is the focus of the transnational d-learning course.

Key words: scientific strength, d-learning, Aviation technology education

1 Introduction

The scope of human activities has moved from the land to the ocean, from the ocean to the atmosphere, and a gradual expansion to outer space. Appeared in the 1950s, the era was very technological as it opened the new era in which humankind started the exploration of outer space.

1.1 Aviation Technology Education and Portfolio Assessment

Two found questions are how to deal with the Research Information Skills (RIS) mold content and structure of an subject in order to benefit both the aviation technology education and how to deal with the materials required to digitize the course file[9].

Initiation of the research on portfolio assessment for RIS, used the following definition of portfolios: A portfolio is a purposeful collection of student work that exhibits the student's efforts, progress, and achievements in one or more areas. A portfolio . . .provides a complex and comprehensive view of student performance in context. It is a portfolio when the student is a participant in, rather than the object of assessment . . . it provides a forum that encourages students to develop the abilities needed to become independent, self-directed

learners[24]. The study of portfolio assessment was further guided by Wolf's definition that it is the process that knowledgeable teachers engage when they systematically observe and select their students' performance through multiple methods, across diverse contexts, and over time as students participate in meaningful learning activities[12].

The advantages of portfolio assessment [20],[12],[2] were noted when initially deciding on portfolio assessment. Several authors[12],[7],[4],[20] discussed students' reactions to portfolios. The following indicate some disadvantages and what compensation was attempted..

1.2 The portfolio assessment with collaborative online network

Portfolio assessment has been developed as an online assessment tool in recent years. Many academic organizations use Internet as a learning bridge among students and expect them to make use of online resources and connect the world. Multimedia and interactive e-learning are used to narrow the gap among students, promote international cooperation, and implement international exchange. Currently, there are 3 million students and 250,000 high school and primary school teachers participate in collaborative online network.

Recently, many and many teachers have been trying Project-based learning (PBL) which is different from the traditional teaching method. PBL emphasizes to help students innovatively apply what they have learned to their daily life. The students find subject matter, design questions, draw up action plans, collect information, solve problems, set up policies, complete a research process, and present a learning mode for the Aviation Project[17].

2 Literature Review

The administrative policy of the Ministry of Education always focuses on actively promoting, producing, and studying collaboration, international cooperation and exchange, and coaching the school characteristic to improve educational quality[16] . Above all, this plan is to foster students to possess the special research ability and implement the concept of science and technology of aviation.

2.1 The Importance of Aviation Technology Education to basic education:

The National Science Council takes a broader view of the whole world[19]. Knowledge and information seem to grow at a continuously faster and faster speed. The benefits of international economic trade tend to liberalize society by changing educational policies. In addition, ecology and environmental protection requirements are rigorously enforced. As populations are increasing, other serious problems are coming one after another. For example, grain, energy, source of water, the earth's long-term ecological balance, and the demands of human development all become the challenge of national development. The most important thing is the impact of knowledge-driven economy in the era. The information-intensive society comes with higher speed and affects the operation of human life. Enterprises and policies in education will be influenced deeply throughout the world because of the progress in science and technology. In other words, students must attain knowledge and skills. The implementation of the education of aviation science and technology is an important subject that can't be ignored in basic education[16].

2.1.1 Transnational Internet d-Learning for Primary and Middle School with Aviation Technology Education:

Recently, the portfolio model has been adopted by many disciplines, especially in higher education circles. According to Cambridge, "portfolios have features that make them powerful tools of learning and assessment" [1]. Portfolios are also used to assess one's performance as an employee. This is particularly true in education, where many educators maintain teaching portfolios. In nursing, professional portfolios are used in the clinical arena as a means to collect visible documentation of contributions to practice for the purpose of credentialing [14]. In the United States, applicants, for example, must submit a professional portfolio for advanced practice credentialing in genetics. Professional portfolios are also used as a means to assess continued professional development. Driscoll reported that they are used to assess orthopedic nursing practice in the United Kingdom [6].

In New Zealand, they used demonstrated competence in practice [21]. All successful examples combine transnational network study, such as, iEARN International Education and Resource Network, AJET(Advanced Joint English Telecommunication), and ASEP(Asian Student Exchange Program) [26].The above-mentioned groups are all the important organizations in Taiwan that deal with transnational network scientific and technological education and study. A webfolio is defined as a "tightly integrated collection of web-based multimedia documents that include curriculum standards, course assignments and corresponding student artifacts in response to the assignments and reviewer feedback to the student's work." [10]. These tools offer other benefits. They foster creative thinking and collaboration. They allow easier integration of content across courses. And they affect faculty and students roles [10].

E-portfolios promote the concept of lifelong learning and allow for both formative and summative self-evaluations [27].

Treuer and Jenson proposed a common set of standards to enter information, store information, and share information for e-portfolios[27]. For users, portfolios include options feedback relating to share materials. The e-portfolio owner can track viewing privileges and the extent which the information has been viewed[27].

To sum up, the portfolio culture requires student participation and faculty commitment for review and feedback. Fundamentally, there must be a vision within the institution that serves as a foundation for the process.

The following are other common critical elements for the use of electronic portfolios:

(1) Administrative support and agreement on a common vision, along with corresponding financial support.
(2) A technology infrastructure that provides sufficient access to tools and a place for storage.
(3) Student and faculty support for both technological and pedagogical skills.

2.2.2 Support from the subject literature on portfolio assessment and new insights

Support for some of our own observations has been gained from the latest subject literature:

– Students should be given a clear indication of the purpose of the portfolio and how it links to the skills to be mastered [25].
– Lecturers need to put in a lot of time for a number of years before the assessment method will be less time consuming[25]. (This is something we have not yet experienced.)
– A culture for portfolio assessment needs to be developed amongst the lecturers as well as the students [15].
– Portfolio assessment can support both formative and summative assessment [18].
– The scoring in portfolio assessment can be very time consuming [25].
– The nature of the “meeting” between lecturers and students changes. The lecturer has less power, and students can also contribute from their knowledge and experience [23].

Another opinion stated that the flexibility and authentic nature of electronic portfolios will prove to be important in reducing teachers’ paper shuffling[22].

2.3.3 Entering Information

Information can be self-reported as text, uploaded files, and web links. Entered work can be associated with one or more professional standards.

2.4.4 Storing information

Text fields and prompts encourage reflection. Portfolios are available for life. Sharing Information Portfolios include options for user feedback relating to shared materials. The e-portfolio owner can track viewing privileges and the extent to which the information has been.

3 Discussions on Web-Enhanced Aviation Project-Based Learning in Connection with the Portfolio To Aviation

Bean pointed that interdisciplinary courses have four features. First, inter-disciplinary courses are based on important issues in real life and thus it is similar to the nature of Aviation Project-based learning in connection with the portfolio. Second, inter-disciplinary courses apply knowledge of context rather than limited to knowledge of subject matter. Third, inter-disciplinary courses do research on current issues, not on a subject. Fourth, inter-disciplinary courses emphasize applying knowledge and solving problems which are also one of the key features of Aviation Project-based learning in connection with the portfolio[4].

(1) Discussing Project-Based Aviation Learning with Constructivism

Constructivists consider that knowledge is understood by a learner's construction. Students should express the learning results by applying surface features of diversified knowledge.

(2) Cognitive Psychology and PBL

Moursund pointed out cognitive psychology highlights learning motivation, fostering students' meta-cognition and ability of self-management which are related to PBL (1). Learning motivation (2). Meta-cognition and self management (3). Context.

(3) PBL and the Internet

Added to the elements of science and technology, PBL is different from traditional teaching methods either in the development of course content, or the means of delivery. Information Technology-Assisted PBL can help students develop diversified skills, enhance research skills, and master diversified evaluation methods, such as self-evaluation, peer evaluation, and learning process files, etc[30]. Furthermore, it can promote common consensus in a community through online discussion boards and interaction between peers, instructors, and experts [32].

(4) The Internet Provides Learning Communities Channels for Collecting Distributed Knowledge.

Learning communities are formed by learners based on different social relationship, such as schools, clubs, organizations, and neighbors, to provide learners a learning opportunity[34] . Therefore, Brown indicated it as 'distributed cognition' in a learning community [33].

(5) The Internet Provides PBL Functioned with Scaffold Knowledge Integration (SKI)

PBL is used widely in teaching strategies. The typical mode is the Knowledge Integration Environment (KIE) in the University of Berkeley (http://kie.berkeley.edu/KIE.html).

(6) Integrative Learning, E-portfolios, and the Transfer Student

The participation of Portland State University (PSU) in a three-year Integrated Learning Project (ILP)—cosponsored by the Carnegie Foundation for the Advancement of Teaching and the Association of American Colleges and Universities—has involved developing and assessing advanced strategies to help students pursue learning in more intentional, connected ways.

3.1 Purposes of the Aviation Project in portfolio assessment

This Aviation Project aims at providing opportunities for students participating in international activities under their teachers' supervision. The purposes of it are as follows:

(1)To foster juveniles' abilities of articipating in Aviation Projects, and promoting their competitiveness.

(2)To broaden juveniles' views, develop their scientific and humanistic abilities.

(3)To encourage juveniles' interests in international cultures and affairs.

(4)To enrich international teaching activities, and develop friendships.

(5)To enhance students' ability to communicate and their global vision.

(6)To advance students' communication ability in Technology Education.

This Aviation Project combines digital information and the Internet to instruct students using PBL to search for information to advance online teaching and learning.

Schedule of the Aviation Project in portfolio assessment

This Aviation Project is scheduled for three phases:

1. Starting the Aviation Project in portfolio assessment

 Develop interactive mode of learning online.

Search for foreign partners.

Decide purposes and methods.

Train teachers with action research.

Learn interactively online.

2. Cooperation Period

Advance international exchange. (Both interactive and non-interactive activities.)

Encourage teachers to have international exchange.

3. Creation Period

Learn collaboratively.

 Participate in foreign web-based competitions.

This Aviation Project is designed to encourage juveniles to care about the important issues around the world, to work collaboratively with team members, and to broaden their global views.

Contents of the Aviation Project in portfolio assessment

1.Purposes

Connect with the international society.

 Develop students' ability of Aviation Project-based learning.

Explore international issues.

Enhance students' abilities in foreign languages.

Ploy of the Aviation Project in portfolio assessment

1. Set up the Website

The website is set up as the center of communication. Teams, information, and interactive functions will be provided online, including:

Teaching platform: including courses and members management.

Interactive platform: including interactive texts, emails, international members, and the discussion board.

Web server: providing storage space for members.

2. Members

The major members are students from primary schools and high schools in Kaohsiung, as well as those in southern Taiwan. Each teacher instructs 3-5 student teams. 400 teams are expected to join this program.

3. Procedure of the activity (6 months for each session)

a. Organize teams.
b. Search for international partners.
c. Register to participate.
d. Propose the plan, and set the title .
e. Start international activities.
f. Record the process.
g. Write reports.
h. Attend related international competitions. (Optional)
i. Publish results on the website.
j. Invite experts to evaluate the results.
k. Announce outstanding groups and reward them.
l. Hold international workshops to share experiences.

4. Modes of Activities

a. Titles can be decided freely by each team, either learning subject matter or English.
b. Partners can be searched by each school or assisted through this Aviation Project.

5. Networks

There are four networks:

a. International Education and Resource Network (iEARN)
b. Advanced Joint English Telecommunication (AJET)
c. Asian Student Exchange Program (ASEP)
d. Science and Technology tegeteaching (such as international online teaching)

This Aviation Project is aimed at building a high-quality online learning environment, integrating learning resources, improving online learning environment, and stimulating teachers' motivation of learning.

3.2 Members of this Aviation Project

This Aviation Project will be attended by the teachers and students in Department of Applied Foreign Languages in Shu-Te University of Technology.

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3.4 Expected Benefits

400 teams (around 2,000 students) from 40 countries and 800 teachers are expected to attend this Aviation Project. It is hoped to achieve the goals as below:

1. Encourage students to learn actively.
2. Broaden students' global vision. Understand diversified cultures.
3. Foster Students' abilities of communication in Aviation Technology Education
4. Train students in the techniques of doing Aviation Project-based research.
5. Show examples demonstrating that the theme of aviation science and technology has teaching materials that can be used in the middle and primary schools of the USA using NASA via this platform. (http://www.nasa.gov/home/index.html?skipIntro=1.)

4 Conclusion

Finally, we have been collaborating with d-Learning partner to help students develop e-portfolios while in Primary and Middle School. We have learned that transfer students who initiate e-portfolios before they arrive Collaborative Online Network and Aviation Technology Education Project in Taiwan.

The e-portfolio is also a promising medium for demonstrating what students learn outside the classroom, which contributes helpful information for advising and provides

connections to transfer students' Aviation Technology Education Project activities. To the extent possible, we are expanding the e-portfolio throughout the undergraduate student's experience at PSU, developing capabilities to demonstrate student learning through general education, the major, and PBL activities. The findings from PSU's work to this date are also being shared with members of the Primary and Middle Schoo Studies Committee to inform their recommendations for revisions to the program. As always, we are engaged in a work in progress. Provide an impetus to cooperatively study teaching and exchange the findings with the world.

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