Enhancing Students' Creativity and Thinking Skills within Arts and Technology Domains: An Active Learning Approach

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ABSTRACT

This paper discusses how an active learning approach (Bonwell, C C and Eison, J A, 1991; Meyers, C, and Jones, T, 1993) was successfully implemented in the curriculum design of the general-education courses offered by the Center for Enhanced Learning and Teaching (CELT) at the Hong Kong University of Science and Technology, which aims to enhance students' creative and critical thinking skills within arts and technology domains. The courses concerned are: GNED002 The Creative Process, GNED003 Arts and Technology, and GNED004 Multimedia Communication Skills for Internet Applications. This paper will first present how an active learning approach was applied in these courses. This is followed by an explanation of how the use of a computer-supported learning environment has helped students to think and learn actively during art appreciation activities and critiques. Feedback from students, in particular on the quality of this instructional approach, was also analyzed and discussed. Lastly, the paper will conclude with lessons learned from the curriculum design process and suggest how to improve the effectiveness of these courses.

APPLYING ACTIVE LEARNING IN COURSE DESIGN

Generally speaking, teaching and learning activities in the CELT general-education (GNED) courses were structured within the so-called "arts and technology domains". We structured the course with "arts" contents while encouraging the use of "multimedia technology" as a means for students' to express their ideas in digital format. These two elements were involved in different courses to differing extents. Within this context, teaching and learning activities engages students in an active-learning environment that consists of various hands-on activities requiring students to explore and experience different ways of expression.

While the arts and the use of multimedia technology served as the foundation for course planning, an "artistic process" (Gardner, H, 1994, p.27) served as the central principle for this active learning approach to be applied to all of these courses at various levels. In general, students participated in creative activities and technical skill

workshops in multimedia disciplines, which aimed to provide students with a stimulating learning environment to experience the 'artistic process'. This process required students to act as:

- artists/creators - working actively in creating their works
- performers (or presenters) – aiming to enhance students' presenting and communication skills
- audiences - learning to appreciate
- critics - learning to think critically

The above four roles are inter-related and are expected to help in realizing the "active learning" process among students as students are more likely to "internalize, understand, and remember material learning through active engagement in the learning process" (Bonwell, C, Sutherland, T E , 1996).

GNED002 The Creative Process

This course aims to develop students' artistic thinking through experience in art activities. Besides attending lectures on art and cultural issues in the context of Hong Kong, students were required to select one kind of art-form workshop from drama, music composition with MIDI, creative video, and dance. These workshops involved students actively in brainstorming, organizing, analyzing, synthesizing, evaluating, improvising, and performing or presenting ideas.

The final project lays emphasis on students going through the so-called "creative processes". Usually students will form into groups to work out their "mixed-media" work. This project requires students to express an original idea through drama, music, video work, or movement/gesture. This is also a valuable opportunity to collaborate, research a topic, evaluating each other's ideas, and synthesize ideas with students who come from different kinds of workshop, and to strike for a common goal—the final product, which has to be presented or performed using any kind of media (or combination thereof).

GNED003 Arts and Technology

In this course, "active learning" occurs when students appreciate, think about, and create art works.

Appreciate

Artworks in various disciplines, including visual, music, installation and multimedia elements, were introduced to enable students to develop their aesthetic sense, cultural awareness, and global outlook. Aesthetic value in arts is emphasized here and students will go through more in-depth, high-order thinking processes in due course.

Think

In order to enhance students' critical thinking abilities, we emphasized in-depth discussion among students focusing on art and cultural issues and their relationship with technological development. This was carried out during tutorials and on-line discussion forum using the "computer support intentional learning environment" (Scardamalia, M, Bereiter, C, Mclean, R S, Swallow, J & Woodruff, E, 1989). Strategies of using this tool will be discussed in details in the following section.

Create

Creating a piece of artwork is a must for a student going through the so-called "artistic process". Before they accomplish their work in digital form or present their work by multimedia means, students have to research their chosen theme/topic. This serves as the foundation on which they build their work.

GNED004 Multimedia Communication Skills for Internet Applications

In this course, the use of "technology" was encouraged as a means of communication and expression. Students in lectures went through basic communication theories with illustrations from daily-life examples. However, this only served the purpose of "knowing the knowledge", and students did not necessarily receive what they are expected to learn. Therefore, project-based assignments were introduced for them to demonstrate how they apply the knowledge acquired. Using multimedia means, such as in graphics, text, sound, or video footage formats, etc., students were required to accomplish projects relating to story-telling, self-portrait, and promoting ideas on the Web. Students' ideas had to be presented through digital media such as video, web pages, and/or a combination of them. These projects are designed to convey messages to the audience persuasively and convincingly. A brief research report was required from each group of students relating to the project content.

"COMPUTER-SUPPORTED INTENTIONAL LEARNING ENVIRONMENT" FOR ART APPRECIATION ACTIVITIES

As one of the objectives of GNED courses is to develop students' critical-thinking skills, a "computer-supported intentional learning environment"—Knowledge Forum® 3—was adopted in GNED002 and 003 to facilitate the online discussion process among students during art appreciation activities and critiques.

Students had to work out their conclusion in response to a topic or problem (Scardamalia, M, Bereiter, C, McLean, R S, Swallow, J, Woodruff, E, 1989; Scardamalia, M and Bereiter, C, 1996). According to the rationale, students have to "build" their knowledge by collaborative exploration of the issue (discussing and researching), while collaboration is

realized through a computer network that enables students to work whenever and wherever possible.

As in the example here, a topic was set out for students to discuss: "Is art important to our society?" Knowledge Forum® 3 (KF3) provided the discussion space in which all communication data were stored in a database. Students who engaged in the discussion could log into the database whenever they wanted and contribute their notes in response to the topic. This environment enabled them to develop their argument by "building-on" others' ideas (by specifying their ideas according to preset "scaffolds" for cognitive operation) that can be shown visually on screen [Figure 1].

Figure 1 Screen from discussion database in KF3

Discussion notes archived inside KF in GNED003 [Figure 1] showed that students were thinking actively and openly within this collaborative learning environment. Students reflected frequently on their own and others' ideas and also built on others' ideas. The situation is in fact a "growing process" from a preliminary idea, query, or problem. Its effects on students' development of aesthetic values, and critical-thinking abilities as well as metacognitive ability, are far reaching.

FEEDBACK FROM STUDENTS ON THE INSTRUCTIONAL APPROACH

Evaluation data were collected from three sources: questionnaire surveys, students' discussion notes from the KF3 database, and interviews with students and instructors. The evaluation instruments were specially designed to examine students' changes in attitudes and values, as well as their self-perception in relation to concepts of arts and creativity.

Questionnaire Survey

A questionnaire relating to the subject matter was structured for each GNED course. Two questionnaires were designed for each course – Questionnaire 1 (administered in pre-test and post-test settings) included open-ended questions focusing on understanding students' changes in attitudes and values in relation to arts and creativity, as well as the changing self-perception of their creative and thinking

abilities. Content analysis was used to analyze students' responses from these questionnaires.

Questionnaire 2 consisted of multiple-choice questions that required students to respond to statements based on a five-point scale. This was conducted at the end of the courses and questions focused on the effects of the course structure and the mode of delivery, students' perception on their critical-thinking ability, creative thinking ability, and so on. Data from this questionnaire were statistically analyzed. Although this was not conducted in pre-test and post-test settings, the results were useful in generating implications for future course planning.

Content analysis of students' discussion notes form KF database

In the case of GNED003 and GNED002, students' discussion notes were examined in detail and focused on exploring the following aspects:

- The number of keywords students used in discussion
- The frequency of appearance of the keywords
- The number of times the individual student quoted the keywords
- The number of times each student commented on other's ideas
- Students' idea flow – Have students changed their discussion focus during the course?
- Whether students have modified their preliminary arguments
- The number of "build-on" ideas of each student
- The frequency of each student quoting others' ideas
- The comparison of students' final argument with their original argument
- Whether students have worked out "their" conclusion in response to the topic/problem
- Individual student's degree of participation

Interviews with Students and Instructors

Interviews with randomly selected students helped us gain an in-depth understanding of their feelings about and comments on the courses. Information from this source was valuable as it reflected students' experiences from a "target audience" point of view. Moreover, interviews with instructors helped our understanding of the problems arising from course planning and coordination.

LESSONS LEARNED AND LOOKING AHEAD

From the curriculum design process and the reflections by students and instructors, the active-learning approach seems to be effective and successfully implemented. Several implications can be drawn at this stage:

First, a free and relaxed environment is essential for students to develop creative thinking. From observing and reviewing students' works, we can see that students very much enjoyed the creative process. Students' comments from interviews revealed this obviously:

"This course (GNED002) provides me with the opportunity to develop my creativity. I have lots of freedom that encourages me to do what I imagine without any constraints".

Leung Wai Sze (BBA, Year 3, 2001)

"GNED003 enhanced my interest in arts and stimulates my artistic sense. I learned to appreciate artworks created by many well-known artists. This course enhances my knowledge in arts and helps me to express my feelings and ideas in alternative way".

Mak Chun Ming Marco (ELEC, Year 3, 2001)

Second, learning effectiveness seemed to be at its highest point when students engaged in the active-learning process. Hands-on activities in workshops, discussion among students and collaborative work, seemed to help students to apply the knowledge they acquired in their work, as well as developing their higher-order thinking skills. Experiencing the so-called "artistic process" is a good means of developing their creative, aesthetic, and presentation and communication skills.

Third, it is the responsibility of the instructors to help students to realize that technology is a means rather than an end in their work. Students often produce fancy subject matter without rich or meaningful content by using multimedia technology. Multimedia technology can be an effective means of expression, but students should bear in mind that it is just a means of expressing their ideas.

Fourth, as reflected from the statistical results of students' feedback, there is still room for improvement in motivating students to work collaboratively. Moreover, the exposure time in specific art forms was not adequate enough for them to understand and experience the subject matter. Therefore, it is essential to make use of the opportunity to merge students from different art disciplines to work together. This might provide them with the opportunity to cooperate, share, and express themselves in alternative ways.

Fifth, students indicated that they sometimes get lost during the course, and also that the lecture content was sometimes too abstract for them to relate to their work. Therefore, it is necessary to have better planning and structure of the lecture content so as to strengthen their understanding of what we expect students do in their assignments.

Lastly, strategies for evaluating students' works are essential for establishing an objective assessment system. Rubrics for assessing students' work may help students to achieve meaningful and effective compositional process.

CONCLUSION

General-education courses in higher education can be an excellent means for students to develop their creative and critical-thinking skills. For such courses to be effective, the instructors must provide students with sufficient space, guidance, stimulus, and encouragement so that they will be willing to try out their ideas and be able to learn through self-exploration and peer interaction. Active learning is thus an important instructional strategy that can serve as the fundamental principle in planning these courses. However, the current evaluation strategies are not perfect enough to reflect the effectiveness of the instructional approach, since performance and thinking in arts are difficult to measure. More research in this aspect is needed in contributing to future development along these lines.

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