

Development for an Introductory Educational Program Before the Full Immersion to the Advanced Active Learning Curriculum: Utilize an Animation as a Communication Method

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Abstract

In this study, we discuss what kind of educational program is required for first to third-year students of colleges of technology (before entering a university) so that they will be able to engage in project-based learning (PBL) smoothly in the fourth to fifth years of college (early undergraduate years). In this paper, it is considered that students should nurture communication skills for conveying their opinions to a third party before PBL, and we developed an exercise program including animation, and put it into practice.

Keywords: Animation, Engineering Design, Active Learning

1. Introduction

We discuss what kind of educational program should be offered to first to third-year students at International College of Technology, Kanazawa (hereinafter called "ITC") in this paper, so that they will be able to engage in advanced active learning in the fourth to fifth years. Here, the advanced active learning means a PBL for improving the ability to solve problems through project activities, which is implemented in engineering departments [1, 2].

From the educational experiences of the authors, it can be said that the factors in degrading the level of students' works in PBL are (1) the lack of technical knowledge, which leads to the proposal for makeshift solutions, and (2) the lack of "communication skills" of team members (who cannot convey their opinions to a third party accurately), which hinders teamwork and active thinking among team members. The problem (1) can be solved with the advice of teachers serving as facilitators. For solving the problem (2), we should have students acquire "communication skills" before group work classes. The communication skills will be necessary when they accurately explain the purposes, effects, etc. of design to team members and share information as engineers during a project or the like.

2. Animation exercise class

In the animation exercise, students use an animation as a communication means, and aim to convey what they want to express to a third party accurately. The exercise of animation is composed of the following three steps.

2.1 Scanimation work activities

From the 1st to 3rd weeks of the 15-week period, students produce animations while following the principles of Scanimation, which is also called a slit animation. Its mechanism is as follows:

- (1) Superimpose a transparent slit sheet (on which a black-and-white pattern is drawn) on a synthetic image produced by combining "the images of several frames rendering a motion,"
- (2) Slide the sheet, so that the synthetic image will appear as several continuous images, and (3) The brain complements information for hidden parts, giving an illusion of animation. Students endeavor to please an audience and convey some messages through their works.

2.2 Flip book work activities

From the 4th to 6th weeks, students produce a flip book. They draw a picture in a notepad exclusively for a flip book, while altering it little by little, so that it will apparently move due to the afterimage effect, when the pages are flipped rapidly. In the exercise class, students drew a picture in a notepad exclusively for a flip book named "Origin of Flip Book" produced by Tanaka & Shobundo. This notepad has a length of 60 mm and a width of 120 mm, and is constituted by 50 pages. The work of each

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student was filmed with a video camera, and video data were submitted. The video is an animation of about 10 seconds, and students who excel at producing a work with a good story (to render what they want to express) start standing out around this exercise.

2.3 Stop motion animation work activities

From the 7th to 15th weeks, students produce stop motion animation. The pictures of a motionless object are taken while moving it slightly frame by frame, and its still images are filmed. Since students have experienced the production of a flip book, they are aware of the necessity to add a story to each work.

In order to reduce the burden of filming images, the non-contact scanner "SV600" produced by Fujitsu Ltd. was used, because it can shorten the time of setting equipment for filming images, and students can readily film continuous still images. Another advantage of this device is that a user can move a target object with his/her both hands. Students were instructed to take about 5 - 8 pictures per second, to produce an animation work of about 2 minutes. To do so, they need to take about 600 - 900 pictures within a specified period of time. The students take pictures and complete their respective works smoothly, with reference to their storyboards that have been produced in advance. This task is for promoting students to nurture the capability of managing a project. Figure 1 shows a student's work.



Fig.1. Student's work in the stop motion animation work activities

3. Questionnaire survey

After the class, a questionnaire survey was carried out, targeting 38 students who had submitted the above three works. 36 out of 38 students gave valid answers (Figure 2). The following questions were asked, in order to grasp the situation of students after this class.

- Q1: After this exercise, do you think that you became able to plan and engage in something within a limited period of time?
- Q2: After this exercise, do you think that you became able to learn things voluntarily in addition to being taught?
- Q3: After this exercise, do you think that you became able to reconsider your design while developing it and redesign it (to embody your idea)?
- Q4: After this exercise, do you think that you become able to draw or tentatively embody your idea?
- Q5: After this exercise, do you think that you became able to summarize and convey your idea to others?

Q1 is a question about project management, while Q2 is a question regarding an active learning class. About 65% of students answered these questions positively, "I certainly became able to do so" and "I became able to do so." This result is satisfactory, as this class is tentative. Q3 to Q5 are questions regarding "communication skills for accurately conveying what they want to express to a third party." Q3 and Q4 are regarding "the abilities to develop ideas and embody them." For both questions, about 70% of students gave positive answers. Q5 is a question regarding "to convey ideas to others," and 40% of students think that "they have not acquired that ability" or "they have not acquired that ability at all." Some of them are not satisfied with their own works, and this seems to have affected the answers to Q5. Even when a teacher judges, from a student's animation work, that he/she has the ability to convey what he/she wants to express, his/her self-evaluation is severer than the teacher's expectation.

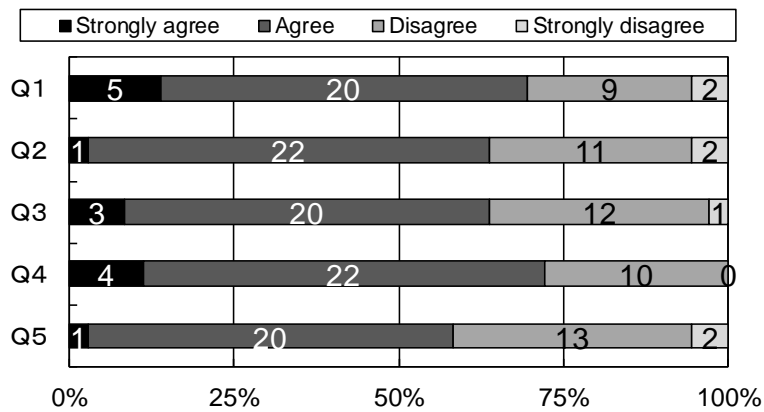


Fig. 2. Questionnaire survey conducted targeting students

4. Conclusions

In this study, we discussed what kind of educational program would stir up the interest of students, so that “they will become able to convey what they want to express to a third party accurately.” This paper studied the utilization of an animation as a “communication tool” through educational practices. An exercise class for producing three kinds of animation works was offered to first to third-year students of ITC, as an educational program for nurturing “communication skills.

References

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